BUREAU OF WATER

ANNUAL REPORT

PHILADELPHIA

1890.

Eighty-Ninth Annual Report

OF THE

BUREAU OF WATER,

For the Year Ending December 31st, 1890,

AND

FOURTH ANNUAL MESSAGE

OF

EDWIN H. FITLER,

Mayor of the City of Philadelphia,

WITH

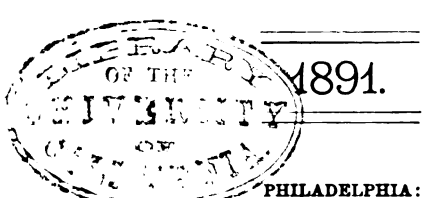
ANNUAL REPORT

OF

LOUIS WAGNER,

Director of the Department of Public Works.

ISSUED BY THE CITY OF PHILADELPHIA.



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1891.

FOURTH
ANNUAL MESSAGE.

OFFICE OF THE MAYOR, CITY HALL.

Philadelphia, April 6th, 1891.

TO THE SELECT AND COMMON COUNCILS
OF THE CITY OF PHILADELPHIA.

GENTLEMEN:—In presenting this, my Fourth Annual Message, to your Honorable Bodies, my term of office as Mayor of the City of Philadelphia expires.

I beg to again express to you the gratification it has been to me to feel that during the four years of office your earnest support has always been accorded me, and to thank you for the confidence you have reposed in the Mayor and in his Departments.

That much work has been done in the improvement of the City during the last four years is plainly shown in the reports of the Departments under my control. That all the work that both Councils and the Mayor wished to do, has not been accomplished is not because of the lack of knowledge of the improvements needed by our citizens, but because of the positive and ever present fact that we had no money with which to do the work. Our borrowing capacity, as fixed by law, having been exhausted, it was not deemed advisable to resort to increased taxation.

The failure of the efforts to cancel the loans of the City, now held by the Sinking Fund, has always been a source of regret to me. If this could have been done, about six million

($6,000,000) dollars, paid as interest and Sinking Fund, could have been added to our resources, without loss or detriment to the bondholders, and without taxing the people for a single dollar. This large sum would have given us many improvements that are badly needed and would have gone far towards giving us the loudly called for "New Philadelphia."

If our streets are to be paved and repaved with improved pavements; our gas plant enlarged and the old and almost useless pipes renewed; reservoirs, for storage and subsidence, of at least two billion (2,000,000,000) gallons of water built and our pumping capacity increased and additional main sewers constructed, the people who read and reason can plainly see that this cannot be done without money, and as we cannot borrow, and as fault-finding and grumbling are not good collaterals, the only possible way to raise money is by taxation.

This problem the people can solve by looking the inevitable squarely in the face and by giving their representatives in Councils instructions to increase the tax rate; failing in this, our present gradual process of permanent improvements must continue.

The leasing or sale of the gas or water works is a favorite scheme by which to raise money, which has been often proposed to the City; but as these two plants now yield the City large revenues, annually increasing, we had better go slow and await future developments before surrendering either of these great and profitable properties into the hands of private corporations. By judicious improvements, and by honest and intelligent management, the City can realize out of these works as good results as any private company, and when she can spare the revenue, the price of water and of gas can be reduced to consumers.

During my term of office a number of inquiries have been received from other cities asking for information in reference to our gas and our water works—whether the City owned the plants, and if she did, what was the revenue from them and

how they were managed. In each and every case I have found that the inquiry came from places where the gas and water works were owned by private corporations, and that the municipality desired to purchase them, and not a single inquiry came from cities which owned their works and which desired to sell them.

It must be borne in mind that either the water works or the gas works, now the property of the City, could be mortgaged for a sufficient sum, at four per cent. per annum, to pay the balance of the City debt not now in the Sinking Fund, and, after paying the interest on such mortgage, either of these works would yield to the City a credit balance of not less than five hundred thousand ($500,000) dollars annually.

The value to the City of Philadelphia of these two properties, will never be realized until she loses either of them, and I sincerely trust that the day is far distant when either of these great and valuable properties will be either leased or sold.

The finances of the City are in a good and healthy condition; they never can be otherwise, for we must "pay as we go," and, therefore, cannot run in debt.

During last year your Honorable Bodies authorized the borrowing of four million six hundred thousand ($4,600,000) dollars at a rate of interest not exceeding three per cent. On account of the great stringency of the money market, but a fractional part of the first issue of two million three hundred thousand ($2,300,000) dollars was taken by private investors, the balance being purchased by the Sinking Fund. This sum was duly appropriated for the new work, named in the ordinance creating the loan, and that so authorized is now under contract. The sum of five hundred thousand ($500,000) dollars, borrowed of the Sinking Fund for urgent and immediate improvements in the building of main sewers, has been repaid.

The balance of the loan, two million three hundred thousand ($2,300,000) dollars, available for the year 1891, has also been

bought by the Sinking Fund and is now waiting action by Councils for its distribution.

I much regretted the necessity of increasing our debt, but as this could only be avoided by an advance of the tax rate, which your Honorable Bodies did not deem prudent, and as much important work was needed, such as the construction of the Norris street and the Twenty-fifth street main sewers, the new basin at Roxborough, and the Walnut street bridge, it was thought best to make the loan.

We have this year paid off one million seven hundred and seven thousand six hundred ($1,707,600.00) dollars of our old loan, and at the rate at which our loans are now maturing it will not be many years before the City of Philadelphia will reduce her debt to a sum far below that of any of the other large cities in the Union.

It is perhaps unwise to discount the future, but to build subsiding reservoirs, so as to give our citizens at all times clean and wholesome water; to remedy our insufficiency of pipes and to build and equip adequate pumping machinery; to enlarge the manufacturing and storing capacity of our gas plant, and to lay larger new mains, to replace the old ones, so as to give consumers gas at a sufficient pressure; to repave the old streets with improved pavements; to increase our police and fire forces so as to give all parts of the City proper protection; to build new school houses for the ever growing population, will require a large sum of money—so large—say, twenty-five million dollars ($25,000,000)—, that it cannot be borrowed for years to come without changing the constitution of the State, and, as this is impracticable, it must be raised by taxation. To secure it in this way will take many years.

The citizens who are pressing for a "New Philadelphia" are right in their efforts, but they should, at the same time, look carefully into our financial condition and they will discover that we have reached the end of our tether, and that we must wait until our finances will permit the needed work to be done.

DEPARTMENTS.

Public Safety.

The Director of the Department of Public Safety has submitted a full and careful report of the operations of the Bureaus under his control.

Bureau of Police.

The wisdom of the passage of the Act of June 1, 1885, is clearly shown in the discipline and effectiveness of this Bureau. The policemen and firemen are under the control of one head and in case of emergency, when they are required to act in concert, a large body of well drilled and competent men can be called upon to suppress riot, to battle with conflagration or to avert any danger to the lives or property of our citizens.

The protection thrown around these men by the Civil Service Rules, and the erection of modern police and fire stations, contiguous to each other, in which their health and comfort is carefully considered, have added greatly to their efficiency and the morale of the force and have also decreased the expense of its maintenance.

The Police and Fire Bureaus have each organized a Pension Fund, to assist the families of their members in case of death and to protect themselves from want after their official usefulness has ended.

The Act approved June 1, 1885, made this the duty of your Honorable Bodies, but as no action has been taken by you, I suggest that at least a moderate appropriation be made annually to each of these Funds, in order to assist and encourage the men in this judicious and laudable enterprise.

The number of men on the police force has not been increased in proportion to the rapid and extended growth of the City. We build about twelve thousand (12,000) houses each year, covering a square mile of territory, and as property owners pay the larger proportion of the expenses of the City, they are entitled to ample protection.

The mounted service in the rural districts has proven a great

success and I feel justified in recommending some increase in the regular and in the mounted force each year, so as to give better police protection to the newly built up portions of our City and also to the rural districts.

Bureau of Fire.

This Bureau stands much in need of your generous consideration. Seventeen new Silsby rotary engines have been placed in service during my term of office and have proved their power and capacity at every fire.

The old and antiquated engines, still in service, are constantly getting out of order and they should be replaced by Silsby engines as rapidly as possible. When this is done all parts of our engines will be interchangeable. Castings for the working and wearing parts could be prepared and kept in stock, so that a broken or a worn out-part of an engine could be replaced with the least possible delay.

In many of the new mills of this country this is now the rule and it is found to be a great saving in the item of repairs and also in the loss of time.

The two reserve engines asked for by the Director will add to the economy of this Bureau, and the additional hose for each company, with a reserve to be kept at headquarters, will increase its working efficiency.

As the work of this Bureau is one of great danger no money should be spared by the City to equip it with the most effective machinery, and it should be kept in the most perfect and scientific order. Five minutes' loss of time, by the failure of an engine to do its work at a fire, might cause the loss of thousands of dollars of material wealth, which insurance may pay for, but which is utterly lost to the community.

An addition of men and of machines is asked for for this service, and as your Honorable Bodies fully realize the actual necessity of perfecting this Bureau I leave it to your good judgment, feeling assured of favorable action.

Electrical Bureau.

This Bureau, under the scientific and intelligent management of Chief Walker, has become the Mecca of all the municipal electricians of the United States. Almost every mail brings an inquiry respecting its workings, its cost and, more especially, its underground wires in actual service and under the control of the Bureau. I admit that I had doubts as to the success of underground wires carrying the high tension currents for arc lights, and especially as to the practicability of placing in the same conduits with them the wires to be used for telegraph and telephone service. The success attending the experiments made by this Bureau have proven, beyond doubt, their entire practicability, all this having been accomplished without loss of current from the arc light wires, either from faulty insulation, decay or moisture, and without inductive interference from them with those used on telegraph and telephone circuits.

It is my full belief and conviction that, with a proper and continuous system of conduits (which the City neither owns nor controls at the present time, and which she should use and possess as early as possible), all the overhead wires in the City, including telegraph, telephone, incandescent and arc light wires, could be placed underground, and be made to work in the most successful and satisfactory manner.

To do this, the City should own all the conduits beneath her highways; she should build and perfect them and then, under judicious regulations, lease the rights and privileges to use them, reserving sufficient space for her own electric lighting and for other municipal purposes.

The City, as soon as she can spare the funds, should establish her own electric light plant, leaving the private lighting to private companies. If this were done, much annoyance to our citizens and to our Departments, by the multiplication of poles, would be avoided and great relief given by the removal of the forest of poles, of wires and cables that are now found in the heart of our City.

I suggest that your Honorable Bodies appoint a Committee to examine into the system of underground wires now in use in this Bureau, with power to call into consultation the most intelligent and scientific men that can be found. Such an examination will go far to assist in your deliberations and, I feel satisfied, will result in the removal of all wires which now encumber our highways and remain as a menace, to our firemen particularly, and to the people of our City, generally.

In the meanwhile, and in order to place the City in a position to obtain her electric lights at the lowest cost, I recommend that the City erect and own all the poles for electric lighting, so that the companies that secure the contracts from year to year can use them, paying such rental as may be fixed. This will at once put an end to the duplication of poles from which the property owners are now suffering.

The Director of the Department and also the Chief of the Electrical Bureau discuss this question fully in their reports, and I ask for them your careful consideration.

Bureau of Health.

The report of this Bureau shows that the general health of the City continues good.

I called your attention in my last message to the Municipal Hospital, asking that you give its removal timely consideration. The City is growing rapidly in its direction and the money realized from the sale of the present property would, without doubt, pay for a new site and also for the erection of buildings with all modern improvements.

The gentlemen directing this Bureau give their time to the duties imposed on them, without compensation, and are entitled to our best thanks.

Bureau of Building Inspection.

This Bureau has been reorganized. Its report shows that permits were issued for buildings and alterations, the total value of which is thirty-two million five hundred and fifty-

two thousand seven hundred and fifty-five dollars and fifty cents ($32,552,755.50); certainly startling figures for a single year, and which should convince the greatest doubter that our great City is not standing still.

This Bureau paid into the City Treasury six thousand nine hundred and two dollars and sixty-one cents ($6,902.61); the balance of its receipts over and above all expenses.

Bureau of Boiler Inspection.

This Bureau continues its good work. The number of boilers under its supervision is three thousand and six (3006). This Bureau paid into the City Treasury three thousand eight hundred and fifty-five dollars and thirty-two cents ($3,855,32); the balance of its receipts over and above all expenses.

Bureau of City Property.

This Bureau reports receipts for the year of eighty thousand five hundred and forty-eight dollars and fifty-four cents ($80,548.54).

The rentals paid by the City for various properties, under the care of this Bureau, amount to twenty-nine thousand three hundred and thirty-six dollars ($29,336), the interest, at four per cent. annum, of seven hundred and thirty-three thousand four hundred dollars ($733,400).

It has been suggested by the Director and the Chief of the Bureau that the City would save money by purchasing such properties as are suitable for the purposes for which they are used, and I concur in their views.

The report of the Director of the Department of Public Safety contains many suggestions for the well-being and the improvement of the several Bureaus under his control. His long experience makes them valuable, and I kindly ask you to give them careful perusal.

Department of Public Works.

The Fourth Annual Report of the Director of the Department of Public Works fully sets forth the great and important work accomplished, and also that which is now being done, under contracts, by the various Bureaus of this Department.

Practical knowledge, combined with earnest application and with the high standard of industry and integrity that has been infused into all the Bureaus, has produced results that have long been prayed for by the taxpayers of Philadelphia. Economy has become the rule, wastefulness has ceased, and all surplus labor has been dispensed with.

Figures that can be verified speak for themselves, and those set forth show the great savings and earnings of this Department. They are open for verification to a committee of your Honorable Bodies, or to any body of citizens or experts who may desire to look into them.

This report has been made up to inform, not to mystify, the minds of the people, and it is time that they lay aside their apathy in public affairs and learned for themselves how the money is expended, that has been collected from them by the various methods necessary in City affairs.

Bureau of Gas.

The Bureau of Gas is now managed on strictly business principles and the good result is manifest in the increased earnings paid into the Treasury. A few years more of such careful management and the additional improvements recommended will make this the best paying gas plant owned by any City in the world.

The daily product of the works has been increased seven million (7,000,000) cubic feet, and the holder capacity three million (3,000,000) cubic feet, giving a daily manufacturing capacity of twenty million eight hundred thousand (20,800,000) cubic feet, and a holder capacity of fourteen million nine hundred and eight thousand (14,908,000) cubic feet. The fifty thousand (50,000) feet of twenty (20) and thirty (30) inch

mains laid during 1890 have enabled the Bureau to distribute gas at a more uniform pressure and in increased quantities throughout the City.

The amount of gas produced from one pound of coal carbonized has been increased from four and fifty-four hundredths (4.54) to four and seventy-seven hundreths (4.77) cubic feet.

The candle power has also been increased from seventeen and twenty-nine hundredths (17.29) in 1886, to twenty and seven hundredths (20.07) candle power in 1889—being equal in quality to any furnished by any corporation or city in the Union.

By the introduction of the latest improvements, and with prudent management, the cost of gas has been reduced from one dollar and seventeen cents ($1.17) to eighty-four (84) cents per thousand (1000) cubic feet, both including the cost of distribution and of "betterments."

In 1890, the output of gas was three hundred and sixty-five million one hundred and eighty one thousand (365,181,000) cubic feet more than in 1886, at a decrease in cost for labor and materials of six hundred and ninety-two thousand eight hundred and thirty-seven dollars and forty-seven cents ($692,-837.47).

The number of men employed in this Bureau has been reduced from two thousand two hundred and fifty-seven (2257) to one thousand five hundred and forty-six (1546), a decrease of seven hundred and eleven (711).

The net cash profit to the City in three years (during a part of 1887, my first year of office, the gas works were under the management of a Board of Trustees, and this year is, therefore, not taken into this account) was two million two hundred and thirteen thousand seven hundred and nineteen dollars and fifteen cents ($2,213,719.15), with "extensions" costing eight hundred and seventeen thousand six hundred and sixty-seven dollars and forty-eight cents ($817,667.48), which any manufacturing establishment would have charged to "Capital Account." To these two items the gas furnished the City

without charge, amounting to two million four hundred and thirteen thousand five hundred and twenty-eight dollars and thirteen cents ($2,413,528.13), must be added, making the total benefits that the City has derived from the works in three years, 1888, 1889 and 1890, five million four hundred and forty-four thousand nine hundred and fourteen dollars and seventy-six cents ($5,444,914.76.)

The supply of gas in the City west of the Schuylkill River should be increased. The citizens have just cause for their complaints. Storage capacity is badly needed there, and a holder, with the necessary buildings and machinery, should be be built in the low ground attached to the Blockley Almshouse, and large mains needed for the proper distribution should be laid. This should receive your early attention.

As water gas has now been tested and approved in almost every City of any prominence in this country, I recommend that a plant be erected at the Point Breeze Works, of the same capacity as the one at the Twenty-fifth Ward Works. The City should own both these plants. The manufacture of gas at Market and Twenty-third streets could then be abandoned and the holder capacity at that location be increased.

With this improvement completed and the large mains, necessary for a proper distribution, laid as recommended in the Director's report, the City's gas plant will be in excellent condition to show a large increase over present earnings, even after estimating interest on the money expended upon it.

Bureau of Highways.

The subdivision of the Highway Department, as it existed when I became Mayor, into the Bureaus of Highways and of Street Cleaning, each under a competent Chief, has produced most excellent results.

The Bureau of Highways is now in charge of all the streets of the City and the report of the Director and of the Chief of the Bureau gives in detail the work done.

The paving and repaving, with improved pavement, during

1890 amounted to more than forty-six miles. The paving and repaving, with improved pavements, done during 1887, 1888, 1889 and 1890 amounted to one hundred and twenty-seven miles, out of the total of seven hundred and twenty-five miles of paved streets now in our City.

It is unfortunate that the contest with the Railway Companies, as to their liability to repave the streets they occupy has not been settled by the Courts, and until this is done it rests with your Honorable Bodies whether or not the good work, commenced in 1889 and 1890, shall be continued.

The people reap the benefits of all these improvements, and if they do not complain or find fault with the expenditure of four hundred and eighty-one thousand three hundred and thirty-six dollars and eighty-two cents ($481,336.82) for repaving streets occupied by the Railway Companies, why not continue the work? If the Courts finally decide the Companies liable, the City will get her money back and if they decide against the City, the people will thank you for having anticipated the decision and removed the cobble stones at the expense of the City.

The number and names of the streets repaved with improved pavement, during the last four years, are given on pages 95, 96 and 97 of the Director's report.

The other work done by this Bureau, such as grading, repairing of paved streets and macadamized roads, resetting of curb, laying of crossing, gutter and tramway stones, is fully set forth on page 98.

Bureau of Street Cleaning.

The Bureau of Street Cleaning has performed such satisfactory work during the three years of its existence, that that which was at the beginning of my administration and throughout 1887 the weak spot in our City's condition, now occupies a front rank in efficiency.

The streets to-day are cleaner than they have ever been

before in our City's history, and the garbage and ashes are removed regularly and promptly.

In the past year an important contract was annulled for non-fulfilment, and a most salutary effect created thereby upon the contractors throughout the Department.

The total expenditures in 1890 were ten hundred and seventy-eight dollars and ninety-two cents ($1078.92) less than in 1889, but for 1891 the contracts of this Bureau amounted to five hundred and fifty-one thousand, nine hundred and ninety-eight ($551,998) dollars—an increase of over twenty-five per cent. This is due to increased service by reason of new streets opened, additional houses from which ashes and garbage, etc. must be collected, and because extended portions of the City are cleaned more frequently than heretofore.

The expenditures for similar work, during the year 1889, in other large cities, were as follows:

	Miles of paved street.	Amount for work.	Salaries paid officials of Bureau of Street Cleaning, in addition to the foregoing.
New York	355	$1,255,835 00	$180,000 00
Brooklyn	367	491,000 00	32,000 00
Boston	404	550,000 00	.....
Philadelphia	700	422,147 00	$11,920 00

The advisability of such legislation as will enable contracts for street cleaning and similiar work to be made for a term of years is well worthy of your consideration.

Bureau of Lighting.

In this Bureau increased work has increased expenses. Two thousand three hundred and seventy-five (2,375) lights of all kinds were erected and five hundred and thirty-six (536) discontinued, a net increase of eighteen hundred and thirty-nine (1,839), making a total of twenty-eight thousand and thirteen (28,013) lamps now in service.

The expenses were increased forty-six thousand five hundred and sixty-three dollars and forty-four cents ($46,563.44); of this sum thirty-six thousand four hundred and seventy-eight dollars and ninety-six cents ($36,478.96) were for electric lights; four thousand nine hundred and seven dollars and twenty-six cents ($4,907.26) for gasoline lights, and five thousand one hundred and seventy-seven dollars and twenty-two cents ($5,177.22) for all other expenses. These expenses must necessarily increase with the annual additions to the public lighting.

The suggestion that money might be saved and the streets better lighted by a thorough revision of the locations of lamps is presented for your consideration.

Last year two hundred and one thousand two hundred and fifty-nine dollars and twenty-nine cents ($201,259.29) were paid for electric lighting, nearly two-fifths of the total expenditure for lighting. This amount must necessarily rapidly increase, so that the question of the City establishing her own electric light plant is well worthy of your immediate and earnest consideration. The lights are undoubtedly furnished by these private companies at a profit which the City should save, and again, in furnishing their light these companies are enabled, by their occupancy of our highways, presumably to do only public lighting, to enter into direct competition with the City's gas plant in furnishing private lights to her citizens, to the detriment of her treasury. The suggestions of the Director and his Chief of Bureau have my same hearty endorsement as do those, of the Director of the Department of Public Safety and his Chief of the Electrical Bureau, made upon this same subject.

Bureau of Surveys.

The detailed statements in the reports of the Director of the Department and the Chief Engineer and Surveyor concerning the various new main and branch sewer, the different bridges and the work of repairs to both sewers and bridges are commended to your careful attention.

A large amount of important work has been done during the past four years, nearly thirty-three per cent. of all the City's branch sewers and twenty-two per cent. of all her main sewers having been constructed during that time, an increase in branch sewers, since 1887, from two hundred and twenty-two and two hundreth miles (222.02) to three hundred and twenty-nine and fifty hundreth miles (329.50) in 1890, and in main sewers, since 1886, from fifty-six and thirty-four hundreths miles (56.34) to seventy-two and eighteen hundreths miles (72.18) in 1890.

The important subject of a reorganization of this Bureau is placed before your Honorable Bodies by an intelligent presentment of the facts now affecting its efficiency, and I earnestly hope that early and favorable action may follow.

The reorganization of the Survey Districts is nearly completed and has already transformed this branch of the Bureau, formerly a source of expense, into a source of profit to the City Treasury.

The suggestion that an ordinance be passed directing that "private" sewers be constructed under regular contracts as are similar grading and paving of streets, has my approval.

The successful work upon the Cohocksink sewer will this year be completed and give relief to those of our citizens who have too long suffered from the delays in this important work. The other main sewers completed are of inestimable benefit to the sections of the City they drain, as will also be those now in course of construction, particularly those which will do away with the unsightly and unwholesome Aramingo Canal. The completion of the Intercepting Sewer is a matter of much importance, and an earnest endeavor should be made that this result be achieved.

In the last four years twenty-eight bridges of all kinds have been finished, or are now in course of construction, the most important of which are the bridges over the Schuylkill River at Market street and at Walnut street. The latter can be finished in the summer of 1892, provided an appropriation of

four hundred thousand ($400,000) dollars be made for the main bridge structure and the general work of completion. This I commended to your special attention. The smaller bridges were built chiefly over the various steam railroad tracks to abolish grade crossings, a subject worthy of your serious consideration.

The policy of the past four years sought to secure an improved sewerage system by the construction of a series of large or main sewers, draining a more or less extensive territory through small or branch sewers, and in the erection of bridges to locate them where the City's travel indicated a natural and desirable outlet, or where danger to life and limb from grade crossings could best be abolished thereby. If this policy is continued by the favorable and intelligent action of your Honorable Bodies in the matter of reorganizing this Bureau, gratifying results will inevitably follow.

Bureau of Water.

There has been great advance made in this Bureau during my term of office.

The East Park Reservoirs have been finished and are now in use, giving a storage capacity of eight hundred and sixty-nine million two hundred and eighty-eight thousand eight hundred and fourteen (869,288,814) gallons, an increase of six hundred and seventy-three million, eight hundred and seventy-four thousand six hundred and fourteen (673,874,614) gallons.

The daily pumping capacity has been increased twenty-six millon (26,000,000) gallons, and by September next the new pumping engines, of twenty million (20,000,000) gallons capacity, now being built by the Southwark Foundry and Machine Company, will be in service, adding that quantity to our daily supply.

The one hundred and forty-eight million (148,000,000) gallon reservoir, now building at Roxborough, should be completed next year and when finished will make our total storage capacity over one billion (1,000,000,000) gallons, or about

seven days' supply, as against thirty hours' supply when I became Mayor.

The storage capacity should be increased every year, until we shall be able to give the people clear and wholesome water even after any storm of either short or long duration.

The cost of lifting one million (1,000,000) gallons of water one hundred feet high has been reduced, under this administration, from four dollars and thirteen cents ($4.13) to three dollars and five cents ($3.05), or twenty-four per cent.

It cost in 1887 to pump thirty-two billion four hundred and twenty-six million seven hundred and seventy-nine thousand seven hundred and sixty-five (32,426,779,765) gallons of water, and to buy and lay twenty-three miles of pipe, seven hundred and thirty-one thousand five hundred and one dollars and fifty cents ($731,501.50), whilst in 1890 it cost to pump fifty-one billion six hundred and ninety-eight million five hundred and eight thousand six hundred and ninety-nine (51,698,508,699) gallons of water, and to buy and lay thirty-three miles of pipe, seven hundred and twelve thousand four hundred and ninety-seven dollars and thirty-seven cents ($712,497.37), an increase in pumpage of nineteen billion two hundred and seventy-one million seven hundred and twenty-eight thousand nine hundred and thirty-four (19,271,728,934) gallons of water, and of ten miles of pipe over 1887, with a decrease of actual expenditures, notwithstanding all the extra work done in 1890, of nineteen thousand and four dollars and thirteen cents ($19,004.13).

These figures are, as I have said, open to examination, and they should convince every good citizen that this Bureau has been run in the best interest of the taxpayers.

The recommendations of the Director for new engines at Lardner's Point and at Roxborough stations; for the new reservoir on Indian Queen Lane; for the additions at Wentz farm and at Belmont reservoirs, and for large mains in various parts of the City, should receive your early and earnest attention. These improvements are so thoroughly essential to

the life, health and comfort of our citizens that I urge them most earnestly on your Honorable Bodies.

The report of the Director of the Department of Public Works contains much of decided interest, and the many suggestions made for a still greater increase in the efficiency of this important branch of the municipal service, are the results of his judgment based upon the actual experience of the past four years, and as such I commend them to your earnest consideration.

Department of Charities and Correction.

The Fourth Annual report of the President and Directors of the Department of Charities and Correction contains a full and accurate account of that Department.

Bureau of Charities.

The hospital at Blockley is most judiciously managed. The introduction of the Training School for Nurses has had beneficial results. The inmates are now cared for by educated and skilled attendants, giving them greater comfort during their sickness and early convalesence.

The maternity wards, built on the pavilion plan, are completely isolated from the other buildings and are closed against all visitors. The nurses and physicians are placed under rigid antiseptic rules. The advance in the science of surgery and in the treatment in obstetric cases is here most fully shown, for the death rate in these wards has been reduced from .04523 to .00536, or more than one-eighth.

The report of the Board gives an accurate statement of the rules, regulations and treatment now in force in the maternity wards, which will be found of value to those interested in the subject.

Your Honorable Bodies, knowing the condition of this institution, promptly appropriated two hundred and twenty-five thousand ($225,000) dollars for an extension of the buildings at Blockley. The Board, after careful investigation, recom-

mended that the addition contemplated should be made to the Insane Department, utilizing for other purposes the rooms to be made vacant in the present buildings when the new ones are finished. Plans and specifications were made and approved, and the contract was at once given out so as to relieve, as soon as possible, the overcrowded condition of the Insane Department. A description in detail of this much needed improvement will be found in the report of the Board.

Bureau of Correction.

The House of Correction is well managed and its condition is improving every year. The average number of inmates for the year was seven hundred and forty-nine (749) males, and two hundren and one (201) females, a total of nine hundred and fifty (950).

The produce of the farm was valued at eleven thousand two hundred and thirteen dollars and thirty-six cents ($11,213.36); consumed in the institution, nine thousand two hundred and ten dollars and nineteen cents ($9210.19), and the balance was sold and the amount realized, two thousand and three dollars and seventeen cents ($2003.17), was paid into the City Treasury.

The stone and gravel sold amounted to eight thousand six hundred and forty-one dollars and eighty-two cents ($8641-.82), which sum has been paid into the Treasury. The amount of stone, gravel and labor used on public roads amounted ten thousand five hundred and seventy-three dollars and ninety-eight cents ($10,573.98), for which the Department does not receive either cash or credit.

The capacity of the gas works of this institution has been enlarged and improved and it is now in condition to meet all demands for some time to come. The institution is lighted throughout with this gas, and gas is also furnished, without pay, to two hundred and twelve (212) public lamps. The amount paid into the City Treasury, arising from gas sold during the year, was thirteen thousand three hundred and thirty

dollars and seventy-five cents ($13,330.75), being an increase of two thousand five hundred and seventy-seven dollars and fifteen cents ($2577.15) over the previous year. This result proves that the money appropriated to enlarge the gas works was a good investment.

The Shoe Department also shows good results. The shoes produced and the repairs made amounted to eleven thousand eight hundred and eighty-three dollars and sixty cents ($11,883.60). All the shoes used in this Institution and in the Almshouse are made and repaired here.

The labor required for the betterments and the repair of the house and grounds has been supplied by inmates. By this means the institution has been greatly improved, the grounds properly drained and beautified, at the same time adding to the value of the property.

I cannot part from this Board without thanking them for the valuable service they have gratuitously rendered the City, and for the ability they have displayed in the performance of their arduous duties, reflecting honor and credit on my administration as well as upon themselves.

The Annual Reports of the Departments of

Receiver of Taxes,	Law,
City Treasurer,	Education and
City Controller,	Sinking Fund Commissioners

are herewith transmitted for your information and for such action as the recommendations and suggestions contained therein require.

Conclusions.

This report closes my official relations with your Honorable Bodies. I have had four years of experience in the management of the many bureaus placed under the Executive control, and have necessarily obtained some insight into and knowledge of their workings.

I have found that the disposition of the average citizen, whether individual or corporation, is to take advantage of the

City, and that resistance to this tendency by the Executive is necessary. To make such resistance is not popular and the man who has the courage to do it makes many enemies.

In my Inaugural Address I said: "I fully recognize the responsibility placed upon me, and am resolved to enforce the laws of the Commonwealth and the Ordinances without fear or favor." I also said that "Contractors have been willing to accept any contract, presuming, when they did so, that it would not be strictly enforced, and it has resulted in their complete demoralization. It is the determination of this administration to insist upon the fulfilment of every contract, and the failure on the part of any contractor to meet his agreement will result in the annulment thereof and recourse to law against his securities. My belief is that this will bring about a healthier state of affairs."

I can safely say that these pledges have been faithfully kept, and a few severe, but just, lessons given to dilatory and to reckless contractors have been most salutary, and the men now bidding for City work are convinced that they must fully comply with their contracts.

Discipline has been enforced and the observance of proper rules has been required in all the Departments under my control. This has resulted in a faithful discharge of duties and I am justified in saying that I take pride in the manner in which the City's employés in these Departments now do their work.

I assumed this office with all the then Departments in chaos; with the whole City's service to be reorganized and without a precedent to guide in the work. The selection of the men to assist me caused me much anxiety, but the manner in which those selected took hold of the work brought results that justified their selection.

Chaos and confusion soon disappeared and to-day the City has a conscientious and industrious set of employés in these Departments and for four years they have been honestly governed.

The Director of the Department of Public Safety needs no

commendation from me; the people know and trust him. The Director of the Department of Public Works has won golden opinions from those of our citizens familiar with his work. Their loyalty to me has never faltered and they have never failed to watch over and to guard the great Departments to which they were appointed.

I have already referred to the President and Directors of the Department of Charities and Correction, but repeat that they deserve the thanks of all good citizens for the disinterested and gratuitous services they have rendered the City.

This is also true of the gentlemen who have gratuitously and faithfully served the City, on the various Civil Service Examining Boards, and I express to them my thanks.

In conclusion: to the Directors of the Departments of Public Safety and Public Works, and to the President and Directors of the Department of Charities and Correction, I give the assurance that I sincerely appreciate their earnest endeavors to faithfully fulfill every requirement of their great trusts, and that by their honest and intelligent administration of the many and important duties, incident to their several positions, they have won my warmest commendation and unqualified approval.

To your Honorable Bodies I can but inadequately express my sincere appreciation and thanks for the honor of your continued confidence in me and in my administration. It has been a constant source of pride and gratification to me throughout my term of office, and, in the retirement of private life, it will be one of the most pleasant memories of my public service.

In farewell, I hope and trust that you will so continue to legislate that our City's best interests will be served, her great and growing industries fostered and materially advanced, and her many resources fully developed.

I am,

Respectfully,

EDWIN H. FITLER,

Mayor.

FOURTH ANNUAL REPORT

OF THE

DEPARTMENT OF PUBLIC WORKS.

LOUIS WAGNER, Director.

OFFICERS

OF THE

Department of Public Works.

Director,

LOUIS WAGNER.

Chief Clerk,

HARRY W. QUICK.

CLERK—WILLIS SHEBLE.

STENOGRAPHER AND CLERK—W. W. ALEXANDER.

STENOGRAPHER—WILLIAM E. NATTRESS.

TYPEWRITER—CLEMENT L. BURTNETT.

MESSENGER—JAMES A. JUNIOR.

Superintendent of City Ice Boats,

H. E. MELVILLE.

Chiefs of Bureaus,

GAS—WILLIAM K. PARK.

HIGHWAYS—GEORGE A. BULLOCK.

LIGHTING—JOHN J. KIRK.

STREET CLEANING—SYLVESTER H. MARTIN.

SURVEYS—SAMUEL L. SMEDLEY.

WATER—JOHN L. OGDEN.

FOURTH ANNUAL REPORT

OF THE

DEPARTMENT OF PUBLIC WORKS.

LOUIS WAGNER, Director.

Philadelphia, January 2, 1891.

HON. EDWIN H. FITLER,

Mayor of Philadelphia.

SIR:—As required by the law constituting the Department of Public Works, I have the honor to present the report of the operations of the year ending December 31, 1890—the Fourth Annual Report of the Department.

The Bureaus constituting this Department are now so thoroughly organized, and the work to be done by each is so well understood by the officials and employés, that the many and varied public interests assigned to the Department receive prompt and satisfactory attention.

The year's work, limited only by the appropriations made for it, shows large results in quantities and amounts, as well as in quality; the receipts from all sources continue to increase, and the reductions in expenditures show that employment in this Department is no longer a sinecure. A full day's work for a full day's pay is the rule; and the financial statements, herewith submitted, show in most cases actual decrease in outgo, with large increase in the work done, and in all cases where the expenditures are larger than in the previous year the excess is much less than the increased work.

Any reference to this better condition of the public service would be out of place in an official report, except for the idea often expressed, even by intelligent people, that the service paid for out of the public funds naturally and necessarily means deficient and inefficient work, with excessive compensation.

By a strict and impartial adherence to the law prohibiting appointments, except after the fitness of the applicant for the place to be filled shall have been ascertained by a systematic, open and competitive examination, the new appointees are all well qualified for their work, and those heretofore appointed, without such competitive examination, are stimulated to more intelligent service. The results are apparent and of a gratifying character.

As a correction of the popular notion that the public service is an uncertain one, it may be interesting to add that, even with the appointments and removals entirely at the will and pleasure of the appointing power previous to 1887, there are now many men on our rolls who have been in the City's employ fifteen, twenty and thirty years, and one, in the Bureau of Gas, since 1835, when the gas works began operations.

Director's Office.

The work of the Director's office grows with the increase in the operations of the several Bureaus. The Chief Clerk and his assistants are at work early and late, and to their willingness to labor at any and at all hours, and to the intelligence shown by them in the discharge of their several duties, is to be ascribed the systematic and prompt dispatch of the business of the office.

A correspondence, literally from all parts of the world, large enough to keep three stenographers and type-writers employed, and the classifying, entering of record and filing of the many papers and documents received daily, leave them but little leisure time; the result of their labors, however, is shown in well-kept records of the operations of the past four years, of which older departments would feel proud.

The number of applications filed during the past four years, for other than laborers, is 3596, and for employment as laborers 4298. No numbering of the other documents received has been attempted.

The following is a statement of the expenditures of the Director's office for salaries, horse-keep, stationery, etc., for the years 1887 (nine months), 1888, 1889 and 1890. There were no receipts.

Years.	Item 1. Salaries.	Item 2. Horse keep, etc.	Item 3. Printing, stationery and incidentals.	Total.
1887 (9 months)..	$8,550 11	$318 02	$1,685 48	$10,548 61
1888.....	11,776 38	500 00	1,301 08	13,577 46
1889.....	12,120 00	500 00	2,090 58	14,710 58
1890.....	12,883 00	500 00	2,049 84	15,432 84

Specific appropriations for lighting and for sundry other purposes were also made during the years 1887, 1888 and 1889, amounting to $436,109.67; but as these were not a part of the regular expenses of the office of the Director, they are not considered in esti mating the cost to the public of this branch of the public service.

City Ice Boats.

The three ice boats, in thorough condition of repair, and ready for work, remained at their docks all winter, the mildness of the season of 1889–90 making it unnecessary to put them in commission.

The expenditures were, consequently, much less than in any previous year, and $26,359.50 of the annual appropriation of $37,400 was transferred to other Bureaus.

$11,040.50 was expended for repairs and general maintenance; and $296.50, received from the sale of old materials, was paid into the City Treasury.

At the date of this report (January 2d, 1891), all the boats are in commission and at work.

The following comparative summary is an abstract of the work done by the City Ice Boats, and of the receipts for towage, and the expense of maintenance during the years 1886–87, 1887–88, 1888–89 and 1889–90 :

	1886 and 1887.		1887 and 1888.		1888 and 1889.		1889 and 1890.	
	No.	Tonnage.	No.	Tonnage.	No.	Tonnage.	No.	Tonnage.
Vessels, Outward...	13	15,724	5	4,842	.....	.....	.....	.....
" Inward.....	12	9,697	11	6,084	.....	.....	.....	.....
" Assisted ...	1	240	.....	.....	.....	.....	.....	.....
Total.....	26	25,661	16	10,926	.....	.....	.....	.....

	1886 and 1887.	1887 and 1888.	1888 and 1889.	1889 and 1890.
Amount received for towage and assistance rendered.....	$7,311 48	$2,701 73	.....	.....
Amount received from the sale of old material.....	154 84	60 92	$150 87	$296 50
Total paid City Treasurer.....	$7,466 32	$2,762 65	$150 87	$296 50

	1887.	1888.	1889.	1890.
Total amount of warrants drawn.....	$37,029 12	$38,983 19	$21,668 21	$11,040 50
Deduct cash paid City Treasurer.....	7,466 32	2,762 65	150 87	296 50
		$36,220 54		
Deduct cost of dredging and construction of dock at House of Correction.....	.....	2,500 00	.....	.....
Actual current expenditure.....	$29,562 80	$33,720 54	$21,517 34	$10,744 00

Bureau of Gas.

The fifty-sixth annual report of the Bureau of Gas shows an increase in the cash receipts and in every item of manufacture and output, except in the sale of coke and breeze, which, because of the long continued and unusually mild weather, shows a decrease of 278,616 bushels. In the matter of expenditure, whether in money or in materials, there is a decrease in every item, amounting in the cash expenditures to $44,468.09.

The following table gives a summary of the receipts and expenditures for 1887, 1888, 1889 and 1890:

	1887.	1888.	1889.	1890.
Total receipts first three months..	$1,338,818 88			
Total receipts last nine months...	2,477,822 21			
Total for the year.....	$3,816,641 09	$3,875,383 69	$3,658,224 83	$3,659,644 30
Total expenses first three months	$1,319,957 19			
Total expenses last nine months..	2,314,911 92			
Current expenses.....	.....	$3,107,796 24	$2,558,873 43	$2,495,196 52
Extensions.....	.....	214,166 50	292,146 08	311,354 90
One year's interest and Sinking Fund on Gas Loans.....	290,500 00			
Total expenditures.....	$3,925,369 11	$3,321,962 74	$2,851,019 51	$2,806,551 42

The operations of the Bureau during the years 1887, 1888, 1889 and 1890 are summarized as follows:

	1887. Cubic feet.	1888. Cubic feet.	1889. Cubic feet.	1890. Cubic feet.
Total output.....	3,154,842,000	3,209,874,000	3,151,156,000	3,311,995,000
Largest production of gas in any 24 hours.....	*12,821,000	†13,191,000	‡13,561,000	⁋14,058,000
Largest consumption in any 24 hours.....	a13,415,000	b14,454,000	c13,949,000	d16,103,000

* † ‡ ⁋ On December 23d, 24th, 19th and 16th.
a b c d On December 24th, 24th, 14th and 17th.

	Bushels.	Bushels.	Bushels.	Bushels.
Quantity of coke on hand Jan. 1	15,200	2,700	264,845	212,886
Made during the year	9,467,785	9,378,876	6,224,356	5,959,784
Total	9,482,985	9,381,576	6,489,201	6,172,670

Coke sold during the year	5,053,425	4,641,266	3,224,285	2,925,894
Breeze sold during the year	480,370	461,500	434,650	554,425
Used under retorts	3,450,971	3,522,634	2,228,114	2,035,965
Used under boilers and lime-kilns	416,594	409,085	328,888	337,513
In offices, yards and in pipe-laying	78,925	82,246	60,378	62,783
On hand December 31	2,700	264,845	212,886	256,090
Total	9,482,985	9,381,576	6,489,201	6,172,670

	1887.	1888.	1889.	1890.
Number of meters introduced during the year	4,263	4,829	5,241	5,674
Total in use	117,546	122,375	127,616	133,290
Services introduced during the year	8,546	8,302	10,076	10,739
Total in use	129,788	138,090	148,166	158,905
Lights added during the year	94,400	111,540	113,474	122,973
Total in use	1,980,999	2,092,539	2,206,013	2,328,986
Total number of consumers	118,664	123 427	128,867	134,555
Number of public lamps	16,473	17,261	18,074	18,984

It will be noted that the total output is 160,839,000 cubic feet greater than in 1889, and 102,121,000 cubic feet greater than in any previous year.

The receipts, as reported in detail by the Chief of the Bureau, are:

	For gas, services, etc.	Coke, tar, etc.	Miscellaneous.
1890	$3,377,251 77	$275,714 09	$ 6,678 44
1889	3,315,338 71	325,017 07	17,869 05
Increase,	$61,913 06	Decrease, $49,302 98	Decrease, $11,190 61

Total, 1890 ..... $3,659,644 30
" 1889 ..... 3,658,224 83

Increase $1,419 47

To the receipts from gas should be added the value, at $1.50 per 1000 cubic feet, of the increased quantity of gas sold for which payment is not due, as follows:

December 31, 1890 ..... 482,085,900 cu. ft.
" 31, 1889 ..... 467,447,206 " "

Increase ..... 14,538,694 cu. ft.=$21,808.04

showing a total increase of $83,721.10 from the increase in the consumption of gas. These figures will be largely increased during 1891.

The actual reduction in expenditures is $5,362.61 greater than shown in the balance sheet, this amount being the difference between the sum due the Philadelphia Gas Improvement Company for gas delivered and not paid for in 1889 and 1890, as follows:

Due for 1889, and paid in 1890 ..... $40,283 75
Due for 1890, to be paid in 1891 ..... 34,921 14

Difference $5,362 61

COAL CARBONIZED.—Because of the improvement in our carbonizing appliances, and by reason of more efficient service in the works generally, the make of gas per pound of coal is steadily increasing.

The following table gives a comparative statement for the years 1887, 1888, 1889 and 1890:

YEARS.	Coal Carbonized. Pounds.	Gas per pound of Coal.	Gas made. Cubic feet.
1887	671,631,000	4.697+	3,154,842,000
1888	673,748,735	4.701+	3,209,874,000
1889	463,082,430	4.717+	2,231,509,000
1890	456,365,283	4.770+	2,177,073,000

CANDLE POWER.—The quality of the gas for illuminating purpose is of a high standard. The daily tests by Dr. Cresson and by Professor Stephens show an average for the year of 19.73 candles. For some days during the autumn the tests developed the presence of sulphuretted hydrogen, but this difficulty was soon removed by the use of a better class of gas coals, of which we, as well as all the gas companies of the Eastern and Middle States, had been deprived because of strikes at the mines.

The average candle power of the several tests was as follows:

January	20.59	July	18.74
February	20.08	August	19.60
March	19.85	September	19.63
April	19.70	October	20.10
May	19.54	November	19.91
June	19.22	December	19.85

equal to 19.73 candles,
in 1889 it was equal to 20.07 candles,
in 1888 it was equal to 18.54 candles, and
in 1887 it was equal to 17.65 candles.

The number of consumers is 134,555, with 2,328,986 burners, keeping pace annually with the growth of our City. The number of public street lights supplied free with gas is 18,984, an increase of 910.

GAS BURNED BY CITY DEPARTMENTS.—The increase in the quantity of gas used by the several City Departments, and for which neither money nor credits pass to the Bureau of Gas, continues with unabated rapidity, and now amounts to as much as the total private consumption in 1864.

The quantity of	free gas	burned in	1887	506,499,881	cubic feet.
"	"	"	1888	536,158,081	"
"	"	"	1889	521,401,101	"
"	"	"	1890	551,459,572	"

The falling off in 1889 was undoubtedly due to the persistent efforts of the officers of the Bureau of Gas to stay this waste; but as "the gas cost nothing," at least in the estima-

tion of those who thus misuse the City's property, this condition of waste will continue until Councils provide by ordinance that all the Departments using gas shall pay for it, out of appopriation made to them for that purpose.

This, of course, would be taking money out of one pocket and putting it into another; but this process, apparently an absurd one, is better than to take it out of both pockets and dissipate it into the air, of use to nobody.

Show, for instance, by an item in the annual appropriation ordinance that the amount of gas burned in one building has increased from 1889 to 1890, 7,105,100 cubic feet, valued at $10,657.65, and in another institution, 1,193,400 cubic feet, valued at $2,240.10, and somebody with authority will order a halt of such wilful waste.

The value of the gas works to the City, and the annual profits to the tax-payers, will never be placed fairly before the people at large until some account is taken of the immense quantity of gas used in this manner.

EXTENSIONS.—The permanent improvements, called "extensions" in the financial statements, have been continued to the extent of the appropriations made by Councils for this purpose, the sum charged to the item being $311,354.90. In a stock corporation, this would have been entered into the capital account; but under our mode of accounts the money comes out of the year's receipts, reducing the net profits to that extent.

Except the 30-inch main on Sixteenth street, on which work was stopped by the weather, all the work under this Item is completed, and the improved and additional appliances are in daily use.

The more important permanent improvements are the following:

A three-lift holder, 1,500,000 cubic feet capacity, at Ninth and Mifflin streets.

At the Twenty-sixth Ward Works: rebuilding a stack of 3's with a stack of 6's, on the Fleming half-regenerative

system, increasing the manufacturing capacity 1,000,000 cubic feet in twenty-four hours, at the same cost for wages as with the old stack.

This increased production required increased scrubbers and condensers, purifying pans, an exhauster with engine and boilers and a fourteen feet station meter.

At the Ninth Ward Works: two discharging machines, reducing, since their introduction, the item of wages for the same quantity of gas made, over $100 per day; and

At the Twenty-fifth Ward Works: two discharging machines, which have not yet been put in use.

MANUFACTURING AND HOLDER CAPACITY.—The following tables give in detail the capacity of the several Works, and the date of construction, the location and the capacity of all the holders:

Works.	Stacks.	Retorts per Stacks.	Total Retorts.	Grand Total.	Maximum Capacity per Works, 24 hours.	Total Maximum Capacity, 24 hours.
Ninth Ward	4	150	600			
	2	194	388			
Experimental Bench			3	991	6,600,000	
Twenty-first Ward	1	80	80	80	200,000	
Twenty-fifth Ward	6	120	720	720	4,000,000	
Twenty-sixth Ward	2	72	144			
	2	144	288			
	2	120	240			
				672	5,000,000	15,800,000

The above does not include the plant of the Philadelphia Gas Improvement Company, which has a capacity of 5,000,000 cubic feet per day.

There are at the Ninth Ward Works, in addition to the above, eight (8) retorts used exclusively for vaporizing naphtha, for maintaining clear pipes about the Works.

Holders.

Location.	When Erected.	Dimensions.	Capacity.	Total.
		Feet.	Cubic feet.	
Ninth Ward Works.....	1851	140 x 70	1,000,000	
"	1871	140 x 70	1,000,000	
"	1844	80 x 40	200,000	
"	1847	80 x 40	200,000	2,400,000
Twenty-fifth Ward Works...	1876	140 x 70	1,000,000	
"	1876	140 x 70	1,000,000	
"	1885	140 x 70	1,000,000	
"	1885	140 x 70	1,000,000	
"	1889	140 x 70	1,000,000	5,000,000
Twenty-sixth Ward Works...	1852	160 x 90	1,800,000	1,800,000
Twenty-first Ward Works.....	.....	60 x 38	103,000	
"	1874	78 x 44	200,000	303,000
Frankford: Frankford avenue and Bockius street.....	.....	50 x 16	31,000	
Frankford: Frankford avenue and Bockius street.....	.....	45 x 16	25,000	
Frankford: Frankford avenue and Bockius street.....	1869	80 x 26	130,000	186,000
Bridesburg: Richmond and Bridge streets.....	1869	60 x 21	59,000	59,000
Ninth and Diamond streets..	1869	140 x 70	1,000,000	
"	1874	140 x 70	1,000,000	2,000,000
Ninth and Mifflin streets.....	1874	115 x 62	600,000	
"	1890	160 x 84	1,577,000	2,177,000
Twenty-fifth and Callowhill streets	1851	100 x 50	390,000	
Twenty-fifth and Callowhill streets	1888	80 x 42	203,000	593,000
Germantown, near Wister Station, P. & R. R. R.....	1870	100 x 50	390,000	390,000
Total.....				14,908,000

PIPE LAYING.—With sufficient manufacturing capacity and increased, but still insufficient, storage capacity, improvement of the distribution, by the laying of large mains, has been the most important question.

The total mileage of pipes is over 990 miles, which is annually increased by more than 36 miles of new pipe. More than 68 per cent. are less than six inches in diameter, and from these the house service pipes, which are not included in the foregoing totals, take their supply of gas. It is, therefore, of importance that large mains be laid as feeders, and also for the proper regulation of the pressure. This becomes still more important because of the absence of gas holders from many portions of our City.

One of the large pipes laid during the past year was a 20-inch main from the Twenty-fifth Ward Works to the Holder Station, at Ninth and Diamond streets, via Tioga street, Frankford avenue and Ontario street to Kensington avenue, on the latter to Lehigh avenue, thence to Ninth street and to Diamond street, and also on York and Duhring streets, from Ninth street to Ridge avenue, at Thirty-third street, a distance of 34,551 feet. This secures a better supply of gas for the northern and northwestern parts of the City, and permits a greater output from the works named.

Another was a 30-inch main from Passyunk avenue and Sixteenth street, connecting there with the 30-inch main from the Twenty-sixth Ward Works, and extending on Sixteenth street, north, to Columbia avenue. 15,308 feet of this pipe was put into the ground, and the remainder will be laid as soon as the weather will permit work of this character.

The total length of pipe laid was 191,451 feet, equal to 36¼ miles. This mileage would have been materially increased had there been sufficient appropriation by Councils for pipe and for expense of laying the same.

The following is a comparative statement of the pipe laid during the years 1887, 1888, 1889 and 1890:

	1887. Feet.	1888. Feet.	1889. Feet.	1890. Feet.
2 inch		55		
3 "	13,092	13,036	17,172	10,911
4 "	89,792	112,532	139,416	119,797
6 "	48	756	13,948	10,940
8 "	8	39,624	6,100	24
12 "	18,653	22,880	1,460	16
16 "			4,248	4
20 "		19,636	2,868	34,451
30 "			9,216	15,308
Total	* 121,593	† 208,519	‡ 194,428	⁋191,451

* 1887. Equal to 23 miles.
† 1888. Equal to 39¼ miles.
‡ 1889. Equal to 36¾ miles.
⁋ 1890 Equal to 36¼ miles.

Reducing Price of Gas.—The question of reducing the price of gas has often been suggested during the past year, and many erroneous impressions have been formed by the attempt simply to multiply the total quantity of gas made by the price paid per 1000 cubic feet, and in that manner to reach the total which the Bureau of Gas should receive; entirely overlooking, however, the sums received from the sale of residuals, which sums always figure so largely in the annual accounts.

After reaching, by such an easy process, a total literally millions in excess of the actual receipts, the expenditures are then figured by multiplying the total output by the cost per 1000 cubic feet of putting the gas in the holder, and a subtraction of the result from the former figures represents what it is claimed should be the profits of the works.

The whole process is an easy application of the first three rules in arithmetic, addition, multiplication and subtraction, and the results reached are altogether correct as a problem in

figures, but utterly at variance with the actual amounts, simply because many important factors are omitted.

Considering the omitted factors, the problem becomes a little more complicated, but not at all difficult. To the cost of putting gas into the holder, 52 cents per 1000 feet, must be added the cost of distribution and the money expended in "extensions," or enlargements of the works. These Items were nearly 62 per cent. of the original cost of manufacture, making the actual cost of all the gas made in 1890, 84 cents per 1000 feet.

Now, if the City received $1.50 per 1000 feet for all the gas made, the profits derived would, of course, be the difference between that figure and 84 cents, the final cost of the gas, multiplied by the output. But here again a simple example in subtraction and multiplication, even if figured correctly, would lead far from the truth, because a very large proportion of the gas made never brings cash into the City Treasury.

Of the output of last year, plus the quantity sold during the months of October, November and December, 1889, for which payment was received in 1890, only 58.93 per cent. was paid for. 12.76 per cent will be paid for in 1891, a total of 71.69 per cent., the general average for many years past. 14.59 per cent. was burned by the City without paying anything for it, and 13.72 per cent. was used at the works, lost by leakage and condensation, or otherwise unaccounted for.

The following table gives in detail the total output of gas and its distribution during the years 1887, 1888, 1889 and 1890.

Total output and distribution of Gas.

	1887.	1888.	1889.	1890.
	Cubic feet.	Cubic feet.	Cubic feet.	Cubic feet.
Stock delivered and not paid for, and on hand January 1	430,413,600	448,607,400	454,344,800	467,447,206
Manufactured and purchased during the year... (1889. Manufactured 2,231,509,000 Purchased 919,647,000) (1890. Manufactured 2,177,073,000 Purchased 1,134,922,000)	3,154,842,000	3,209,874,000	3,151,156,000	3,311,995,000
Total to be accounted for	3,585,255,600	3,658,481,400	3,605,500,800	3,779,442,206

	1887.		1888.		1889.		1890.	
	Cubic feet.	Per ct.	Cubic feet.	Per ct.	Cubic feet.	Per ct.	Cubic feet.	Per ct.
Delivered to private consumers, for which bills have been rendered	2,163,156,100	60.36	2,168,398,600	59.27	2,191,711,694	60.79	2,227,323,700	58.93
Delivered to consumers (bills not rendered), and in holders, December 31st	448,607,400	12.51	454,344,800	12.42	467,447,206	12.96	482,085,900	12.76

Public lighting, etc.	1887.		1888.		1889.		1890.	
	Cubic ft.	Per ct.	Cubic ft.	Per ct.	Cubic ft.	Per ct.	Cubic ft.	Per ct.
Bureau of Police	8,762,600	00.24	9,385,700	00.25	10,905,900	00.30	13,404,300	00.35
Bureau of Fire	5,843,500	00.16	6,320,800	00.17	7,009,800	00.19	8,698,500	00.23
Bureau of Water	2,067,600	00.06	2,167,500	00.06	2,458,100	00.07	2,419,300	00.06
Public Buildings	8,272,100	00.23	10,650,900	00.29	12,716,500	00.35	19,821,600	00.52
Almshouse	9,798,600	00.27	10,782,100	00.30	12,782,200	00.36	14,275,600	00.38
City Property	6,356,200	00.18	5,691,200	00.16	5,427,200	00.15	4,957,400	00.13
Public Squares	19,124,000	00.53	32,719,000	00.89	7,543,206	00.21	7,376,802	00.20
Park Commission	200,100	00.01	266,400	00.01	498,500	00.01	338,700	00.01
Schools	5,517,000	00.15	6,213,700	00.17	6,636,500	00.19	7,764,400	00.21
					65,941,700	01.83	84,197,300	02.30
					65,977,906	01.83	79,056,602	2.09
Street lamps					440,558,181	12.28	451,960,781	12.35
					455,423,195	12.63	472,402,970	12.50
Used at works, offices, stations, etc					25,651,800	00.71	28,843,900	00.79
					25,598,500	00.71	23,747,300	00.63
Unaccounted for, leakage, etc					441,340,419	12.31	470,736,019	12.87
					399,342,299	11.08	494,825,734	13.09
Total					3,585,255,600	100.00	3,658,481,400	100.00
					3,605,500,800	100.00	3,779,442,206	100.00

The actual quantity of gas for which money was received by the City in 1890 was 2,227,327,700 cubic feet, realizing, at $1.50 per 1,000 cubic feet, $3,340,991.55.

Reduce the price to $1.00 per 1000 cubic feet, as suggested, and you reduce the receipts	$1,113,663 85
The actual cash profits were	853,092 88
Making a deficit of	260,570 97

Any reduction in the price of gas would decrease the receipts of the Bureau of Gas. Whether the City can, at this time, afford to reduce her revenue from this source is a question for Councils to pass upon, and the figures are given in such great detail merely as a guide in the intelligent consideration of the subject.

The appropriations for 1891 are predicated upon an estimated profit of $850,000.00, and the tax rate was fixed to meet these appropriations; if the receipts are reduced by the reduction in the price of gas, how will the deficiency be met?

Councils might make an appropriation to pay for the gas burned free, but this is impracticable until the tax levy for 1892 is made, when the amount needed, over $800,000.00, could be realized from an increased rate of, say, fifteen cents per $100 of valuation. The whole question, however, is one with which the legislative, and not the executive, branches of the City government must grapple.

Cost of Gas.—In the consideration of the matter the following table will be of much assistance:

Table showing the cost for the past six years of 1000 cubic feet of gas at its several stages of manufacture and delivery, and also the price received per 1000 cubic feet based on total output:

Year.	Cubic feet.	In holders.	Delivered to consumers.	Extensions.	Total.	Price of Gas per 1000 cubic feet.	Receipts per 1000 cubic feet.
1884	2,557,678,000	73 cts. —	$1 09 +	22 cts. +	$1 31	January 1 to July 1, $1 90 July 1 to December 1, 1 70	$1 44
1885	2,757,844,000	70 " —	1 03 +	16 " +	1 19	January 1 to July 1, 1 70 July 1 to December 1, 1 60	1 27 +
1886	2,946,407,000	70 "	1 06 +	11 " +	1 17	1 60	1 24 +
1887 (3 mos.)	941,415,000	97 " —	1 30 —	10 " —	1 40	1 60	1 40 +
1887 (9 mos.)	2,213,427,000	67 " —	97 +	07 " —	1 04	1 50	1 12 +
1888	3,209,874,000	66 "	91 +	11 " +	1 02	1 50	1 27 +
*1889	Manufactured 2,231,509,000	60 " +					
	Purchased 919,647,000	37 " +					
	3,151,156,000	52 " +	74 +	15 " +	89 +	1 50	1 16 +
*1890	Manufactured 2,177,073,000	60 " +					
	Purchased 1,134,922,000	37 "					
	3,311,995,000	52 " +	70 —	14 " +	84 —	1.50	1 10 +

"In holders" represents amount of payments for manufacture of gas.

"Delivered to consumers" represents amount of payments for the manufacture of gas and all other payments except extensions.

"Extensions" represents amount of payments for works, mains, and services, less receipts on these accounts.

*In 1889 and 1890 represents the gas manufactured and purchased.

The appended table of operations of the Philadelphia Gas Works for the past fifty years gives information not readily accessible, and which is both instructive and valuable at this time.

41 to 1890, inclusive.

itures rials, Yes and ions.	Excess of Receipts.	Deficiency of Receipts.	Gas Furnished Free by "Bureau of Gas" for Public Lights	Value of Gas at Current Rates.
18				
18				
18				
18				
18 42 85	$57,264 41			
18 34 29	16,048 74			
18 27 64	58,857 12			
18 33 88	19,735 59			
18				
18 35 78		$80,818 85		
18				
18 54 41		101,045 16		
18 55 62	21,998 97			
18 59 64	50,841 59			
18 58 86		139,066 34		

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Block gutters..... 1,466.98 ..... " "

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Bureau of Highways.

The Bureau of Highways, in spite of appropriations insufficient to do all the work ordered by ordinances of Councils, has made satisfactory progress in the direction of better streets. As in the other Bureaus constituting the Department of Public Works, the operations of the year show greater results than in any previous twelve months.

The following tables give comparative statements, in detail, of the work done during 1887, 1888, 1889 and 1890, of the paving of new streets of the repaving of old streets, and of the receipts and expenditures of the Bureau of Highways.

Comparative Statement of Work Done.

	1887	1888	1889	1890	
New Paving	45,170.13	150,750.13	192,965.50	205,923.00	Linear feet
Macadamizing (new)	8,669.00	1,466.98	30,583.00	31,411.00	" "
Grading	139,450.00	213,476.71	323,076.00	516,424.68	Cubic yards
New footway paving		28,166.80	46,069.00	47,199.00	Square yds.
Repairs to paved streets	535,703.13	573,718.64	506,786.00	390,336.94	" "
Footways repaved	3,557.42	7,978.91	15,756.96	12,310.75	" "
Ditches repaved	9,120 00	26,234.00	32,258.00	38,461.00	
Gutter stone laid	11,860.00	15,295.00	11,175 00	63,262.00	Linear feet
Crossing stone laid	20,919.78	35,583.00	40,043.00	46,406.00	" "
Tramway stone laid	2,880.56	106.00	97.00	10,685.00	" "
Curbstone reset	7,501.00	162,798.00	283,809.00	221,564.00	" "
Wooden trunks	1,981.00	4,337.50	5,555.00	5,531.00	" "
Brick and stone drain	578.50	467.00	883.05	311.00	" "
Gutters paved	7,809.00	750.00	693.00		" "
Hand railings		1,193.00	2,776.00	2,802.00	" "
Broken stone used	8,114.64	11,649.04	23,954.14	17,117.00	Cubic yards
Macadamizing (resurfaced)		19,083.02	55,797,00	44,561.00	Linear feet
Footway, curb and railroad notices served	5,057.00	9,124.00	14,073.00	22,999.00	" "
Block gutters		1,466.98			" "

Summary of work done in Improved Pavements. New streets.

	1887.		1888.		1889.		1890.	
	Square yards.	Linear feet.	Square yards.	Linear feet.	Square yards.	Linear feet.	Square yards.	Linear feet.
Granite blocks..	54,398.08	18,683.00	196,232.23	65,852.61	163,022.30	57,609.00	121,895.00	43,540.00
Sheet asphalt...	.....	.....	16,431.28	5,511.76	15,577.36	5,077.00	30,774.00	13,423.00
Vitrified bricks	8,041.00	2,881.00	75,601.00	22,542.00	88,793.48	26,086.00	137 015.00	45,608.00
Asphalt blocks	1,587.00	1,054.00	34,464.00	16,629 00	42,779.00	24,653.00	5,068.00	2,986.00
Macadamizing.	22,666.00	8,669.00	4,229,96	1,466.98	58,856.00	30,583.00	70,290.00	31,411.00
Slag blocks.....	.....	.....	.....	.....	2,146.00	938.00	1,310.00	500.00
Total	86,692.08	*31,287.00	326,958.47	†112,002.35	371,174.14	‡144,946.00	366,352.00	₴137,468.00

Replacing Cobblestone with Improved Pavements. Old streets.

	1887.		1888.		1889.		1890.	
	Square yards.	Linear feet.	Square yards.	Linear feet.	Square yards.	Linear feet.	Square yards.	Linear feet.
Granite blocks..	29,396.86	10,536.00	65,780.85	24,689.36	127,531.37	56,873.00	158,314.00	68,099.00
Sheet asphalt...	33,813.72	10,971.83	44,354.99	13,365.40	81,848.99	21,729.50	124,578.00	31,767.00
Vitrified brick..	4,000.00	1,044.30	8,274.60	2,160.00	.....	.....	.....	.....
Total	67,210.58	*22,552.13	118,410.44	†40,214.76	209,380.36	‡78,602.50	282,892.00	₴99,866.00

* 1887. Total amount of new paving 53,839.13 linear feet, equal to 10 miles, 1,039.13 linear feet.
† 1888. Total amount of new paving 152,217.11 linear feet, equal to 28 miles, 4,377.11 linear feet.
‡ 1889. Total amount of new paving 223,548.5 linear feet, equal to 42 miles, 1,788.5 linear feet.
₴ 1890. Total amount of new paving 237,334. linear feet, equal to 44 miles, 5,014 linear feet.

Comparative Statement of Receipts.

Year.	Receipts.	Increase.
1887	$56,472 82	
1888	58,544 93	$2,072 11
1889	70,203 53	11,658 60
1890	71,514 32	1,310 79

Comparative Statement of Expenditures.

	1887.	1888.	1889.	1890.
Current expenses.....	*$611,725 13	$357,695 71	$377,290 26	$355,013 15
For extensions	399,336 81	537,744 91	690,063 69	1,043,857 99
Total	$1,011,061 94	$895,440 62	$1,067,353 95	1,398,871 14

*For street cleaning, $314,672.69.

It will be noted that the expenditures for 1890 are $331,517.19 greater; all but $7,343.80 of this increase being for new work.

The paving and repaving with improved pavement amounted to 237,334 linear feet, more than forty-four miles. The total work of this character done during the past four years was nearly 127 miles, more than twenty per cent. of the total of paved streets.

The change in the condition of the City's highways is as gratifying as it is extensive, the only drawback being in the central part of the City, where all the principal streets are occupied by passenger railway tracks. No improvement is here manifest, except where the City has removed the cobble stones and replaced them with belgian blocks.

The report of the Chief of the Bureau gives detailed lists of all the streets paved and repaved during the year 1890.

The amount of grading was nearly double that of 1888, showing that extensive building operations, requiring the opening of new streets, continued throughout the year.

The only material decrease was in the item of repairs to paved streets, being 116,450 square yards less than in 1889. The Department is convinced that no more money should be spent on the present unsightly and uncomfortable cobble and rubble stone pavements than is required to make them safe for travel, and that the greatest possible sums should be devoted to repaving them with more satisfactory materials.

The many small streets existing in the older portions of our City, and occupied by both dwelling houses and warehouses, are being rapidly paved with belgian blocks, with pebble and pitch cemented joints, the work done in 1890 being equal to 2.04 miles. This improvement is an admirable one, both from a sanitary and from a business standpoint.

CHARACTER OF PAVEMENTS.—The streets paved in 1889 with "slag blocks" continue to look well, but they have not yet been in use a sufficiently long time to determine positively their wearing qualities. Present appearances are in their favor.

These blocks are made of the refuse from iron furnaces, run in its fluid state into moulds similar in shape and form to our belgian blocks. They make a pavement of great regularity, and give a good foothold for horses.

Another year's tests will positively determine their exact merits for paving purposes.

Nothing has transpired during the past year to cause a change in the classification of the character of the various pavements, made in the report for 1889.

The following is the classification:

"The different kinds of pavements, considering all the purposes for which pavements are laid in populous business communities, in connection with their first cost and subsequent expense for maintenance, should be classified as follows:

"*First.* 'Belgian' block, of good granite.

"*Second.* Sheet asphalt.

"*Third.* 'Vitrified brick.'

"*Fourth.* 'Asphalt' blocks.

"*Fifth.* Macadam or Telford.

"Not sufficiently tested: 'Slag' block.

"No pavements of classes 4 and 5 should be laid in our City at all, and of class 3 only where it is certain that little driving will be done over the streets so paved, and then the joints in the paving should be filled with pitch or paving cement."

The very able dissertation of the Chief of the Bureau of Highways on asphalt and asphalt paving is worthy a careful perusal.

It would be a matter of economy if money were appropriated for the regular sprinkling and rolling of roadways now macadamized.

The City spends much money for spreading broken stone upon these roads. When this stone has been ground into dust, and turned into mud by the rains, or by the excessive use of water in sprinkling, other large sums are paid the street cleaning contractors to cart it away.

All ordinances directing the paving or the grading of streets prescribe that owners of property fronting on such streets shall grade, curb and pave their sidewalks. Legislation upon this subject is so deficient that the Department has not the power to compel compliance with these ordinances.

More effective legislation should be had, and an appropriation should be made with which to do this work, where the owner has neglected to do so. The amounts expended may be recovered, by lien of the properties.

BRIDGES.—The many bridges are, with few exceptions, in excellent condition. All minor repairs have had prompt attention and none need rebuilding except the bridge over the Philadelphia and Reading Railroad, on the line of Girard avenue.

It was expected that the railroad company would agree to pay at least one-half the cost of a larger bridge, but they decline to do so. Councils should, therefore, authorize the rebuilding of the present bridge, the cost to be charged to the item of new bridges in the appropriation to the Bureau of Surveys.

INSPECTION OF SEWERS.—Systematic and stated inspections of all the sewers were made during the past year. Many small breaks were discovered and promptly repaired, preventing more serious damage.

It is a source of satisfaction that not one serious sewer break occurred anywhere during 1890, and that we were spared a repetition of the disasters of the previous year.

STREETS OCCUPIED BY PASSENGER RAILWAY TRACKS.—The important question of the liability of the passenger railway companies to repave with improved pavement the street they occupy, has advanced one step toward final and favorable decision.

The first case tried, to recover the money spent by the City for this work, was decided against the railway company. The subject now goes on appeal to the Supreme Court, and it is hoped that it will be reached, on final argument, early in 1891.

As the questions decided in the case tried are substantially those involved in the remaining suits, these will not be tried until the Supreme Court can pass upon the whole subject.

It is believed that the City will be successful in her claims against the several companies, and that the amount expended, $481,336.82, will be returned to her treasury.

With the question finally decided in this way, the companies will, of course, find it more economical to do the repaving themselves, and the day of happy relief from cobble stone streets will have dawned.

In the contest between the City and the passenger railway companies for the control of the public highways, another decision of great importance was given in the City's favor.

Notice was served upon the company occupying North Broad street, which was out of repair and dangerous to travel, to repave that street with sheet asphalt.

No work being done under this notice, the railway tracks were taken up and the work was begun by the City.

A preliminary injunction stopped the work, but after final hearing the injunction was dissolved, the Court deciding, substantially, that the City had the right to stop the running of cars, if the work needed to be done on the street made such stoppage necessary.

The tracks were again removed, and the cars were stopped until the street was repaved, when the tracks were relaid.

Suit will now be brought against the company to recover the amount spent in the repaving.

CAR LICENSES.—It was found during the year that cars were being run without proper licenses, and an inspection of all the passenger railway lines was made. The result was that several thousand dollars additional license fees were paid, and that all but three of the cases heard by the Magistrate, were decided for the City. Two were appealed by the companies, to test their right to substitute a car not licensed for one regularly licensed but not running.

This question, like the foregoing, will, no doubt, be decided in the City's favor.

These contests are annoying both to the companies and to the City's officials, but the present seems to be a good time to determine the question of the control of the public highways.

REPAVING PASSENGER RAILWAY STREETS.—The Department regrets that its estimate for an appropriation of $300,000.00, for the repaving of streets occupied by passenger railway tracks, failed in Councils, thus stopping the work of improving the streets in those parts of the City most in need of such work.

The proposition is a very simple one: the streets occupied by the railway companies are badly paved, and they should be repaved at once; the companies claim that they are not liable for this work, and do nothing; the City claims that they are liable, but fails to put the Department in funds to do the work. Result: nothing is done, and the streets remain as they were, or get worse.

Now, if the companies are liable, it is a safe investment, at 6 per cent. interest, for the City to do this work and recover from the companies. If the companies are not liable, the City is, and the money will have been properly spent.

However, argument is unavailing, at least for the year 1891, and the work stops for want of funds.

The amount of repaving done on passenger railway streets was:

In 1889	6.60	miles, costing	$196,106.80
In 1890	7.03	" "	285,230.02
Total	13.63	" "	$481,336.82

The advantages are apparent to the most casual observer.

Board of Highway Supervisors.

The reports of the officers of this Board show a very large increase in its net receipts.

The additions to the plans of underground structures already on file, and the making of new plans, are, however, more val-

uable than the moneys paid by the individuals and companies for whose accommodation work has been done by the draughtsmen of the Board. They will become invaluable as records of the condition of the City's highways, as they increase in number, or are added to from time to time whenever underground work in progress of construction develops the location of pipes, drains or sewers, of which but a partial or an incorrect record had been heretofore kept.

It is interesting to note that the number of reports from inspectors of work on underground structures, made by postal card to the principal draughtsman of the Board, has increased from less than 300 in 1889, to 5430 in 1890.

The following is a statement of the number of permits authorized to be issued to the several underground companies during the year 1890:

Bell Telephone Company	92
American Telegraph and Telephone Company	6
Columbia Electric Light Company	3
Brush Electric Light Company	3
Penn Electric Light Company	2
Edison Electric Light Company	2
Merchants' Electric Light Company of north Front street	2
Total	110

PLACING WIRES UNDER GROUND.—One hundred and ten permits were authorized issued, 92 being granted to the Bell Telephone Company, which company has been, for several years past, actively at work in building conduits for its wires. The question of maintaining service by underground wires is no longer an open one, and it is hoped that the telegraph and electric light companies having the privilege of overhead wires will, at an early day, be compelled to arrange for placing them underground.

This question has been so fully discussed in the previous reports of the Department, that the annual repetition becomes wearisome; but so long as the evil of overhead wires exists, so long is it the duty of the City's officials to protest against it and to urge its removal.

By ordinance approved on June 13th, 1882, Councils directed the Electrical Department to remove all these wires before January 1st, 1885, and an appropriation for the work was made on December 30th, 1885. By a joint resolution passed on January 21st, 1886, the Chief of the Electrical Department was directed not to enforce the removal of overhead wires "for the present." Would it not be well to repeal this resolution so that the removal of these wires might be commenced?

Because of the intelligent and active supervision of the officers of the Electrical Bureau, the work on electric light wires on the public highways has been so carefully done that Philadelphia has been wonderfully exempt from the horrible accidents occurring in other cities from poorly insulated or from "crossed" wires; but the fact that we are in hourly danger of life and limb because of their presence should compel proper legislation for their removal.

The following is a summary of the transactions of the Board, of the work of the draughting department, and of the receipts and expenditures for the years 1887, 1888, 1889 and 1890:

Transactions of the Board of Highway Supervisors.

Permits authorized to be issued.	1887.	1888.	1889.	1890.
For vaults	8	8	9	4
For railroad tracks, curves and turnouts	27	10	51	58
For underground pipes	2	3	7	7
For electrical conduits	46	108	107	110
For artesian wells				1

Work done by the Draughtsmen of the Board of Highway Supervisors.

	1887.	1888.	1889.	1890.
Street record plans corrected	32	38	82	223
New street record plans prepared	49	65	39	22
Blue print plans placed on file	90	110	190	127

Receipts and Expenditures.

	*1887.	1888.	1889.	1890.
Receipts		2311 00	3857 00	4677 50
Expenditures		2349 89	2920 00	3000 00
Profit to the City		461 11	937 00	1677 50

*No receipts in 1887. Remunerative work not done until 1888.

Bureau of Lighting.

There has been a large increase in the number of public lights erected during the past year, and a consequent increase in the expenses of this Bureau. 2375 lights of all kinds were erected, and 536 were discontinued, a net increase of 1839, leaving a total of 28,013 lamps, divided as follows:

Gas lamps, supplied free with gas from City Works	18,984
" " " from Northern Liberties Gas Works	354
" " " free with gas from House of Correction Gas Works	172
Gasoline lamps	7,160
Electric arc lights	1,343
Total	28,013

The expenditures have increased $46,563.44, as follows: $36,478.96 for electric lights, and $4,907.26 for gasoline lights, the balance for other expenses. These expenditures will continue to increase with the annual additions to the public lights, but it is suggested that much money might be saved and the streets be better lighted, by a thorough revision of the location of lamps, which have heretofore been erected with such a want of system that some portions of the City have more than a fair share of light, whilst other portions go unlighted.

From a financial standpoint, this injustice would be still more apparent, if the gas consumed in the 18,984 lamps was furnished by a private corporation at the price charged private consumers.

It is a common expression, by those who should know better, "that the gas costs nothing," and hence lamps are frequently authorized where not actually needed. The quantity of gas burned last year, amounting to 472,402,970 cubic feet, would have been sold at $1.50 per 1000, realizing $708,604.45, and this sum should enter into any account of the cost of lighting the City, and the Bureau of Gas ought to be credited with it on the books of the City.

The Pennsylvania Globe Gas Light Company has erected all the new lamps lighted by them during the year 1890, without charge, a saving to the City of over $10,000.

The following comparative statement shows the number of lamps and the expenditures during the years 1887, 1888, 1889 and 1890:

	1887.		1888.		1889.		1890.	
	No.	Cost.	No.	Cost.	No.	Cost.	No.	Cost.
Electric Arc Lights	524	$87,974 53	756	$120,133 52	1,045	$164,780 33	1,293	$201,259 29
Gasoline Lamps	5,297	116,586 09	5,932	131,301 94	6,476	142,643 28	7,160	147,550 54
Gas Lamps Supplied by the Northern Liberty Gas Company	472	10,701 45	415	9,429 55	380	8,810 75	354	8,186 78
Under Charge of Bureau of Gas	*16,473		*17,261					
Under Charge of Bureau of Lightning					†18,074	‡151,417 91	18,984	154,689 48
Electric Arc Lights under charge of Board of Directors of City Trusts					50		50	
Gas lamps under charge of Bureau of Corrections					149		172	
Total	22,766	$215,262 07	24,366	$260,865 01	26,174	$467,652 27	28,013	$511,686 04

* Not lighted because of proximity to electric lights:

1887	1,062	1889	2,460
1888	2,034	1890	2,769

† Until July 1, 1889, under charge of the Bureau of Gas.

‡ Formerly paid out of the appropriation to the Bureau of Gas.

BROKEN LAMPS.—The number of broken lamps reaches such startling figures, that more stringent measures should be adopted, by the proper authorities, to make the breaking of a public lamp too expensive for every-day indulgence. The total number of lamps under the care of the Bureau of Lighting, so far as repairs are concerned, is 18,984, and the report of the Chief of the Bureau shows that 42,453 broken glasses were replaced, more than 2¼ breakages to each lamp.

ELECTRIC LIGHTING.—The sum paid for electric arc lights last year was $201,259.29, nearly two-fifths of the total expenditure for lighting. These figures are growing so rapidly, that the question of the establishment, by the City, of electric lighting stations is becoming one of pressing moment. In the previous reports from this Department, this question was fully argued, and nothing has occured during the past year to change the conclusions then expressed.

The City should do the work of electric lighting, without the intervention of private corporations. The public highways, under and above ground, are granted to these companies, enabling them to compète with the City in furnishing gas to the general public, to the immediate loss to the City treasury. To aid them in doing this, the City then pays them over $200,000—surely bad financial management, benefitting no one except the stockholders of these companies.

The arc lights furnished under the contracts for the past year were of the same candle-power and quality as heretofore, but under the new specifications, everybody was saved the strain upon private and official credulity, involved in the thought that the lights were of 2000 candle-power, and it is now no longer a question whether the companies are doing something which they knew they never did, and never could do. The tests are made for ampéres and voltage, and not for candle-power, and the results of these tests, as made by the officers of the Electrical Bureau, show that the contracts have been substantially complied with.

The following is a copy of the specifications upon which contracts were made for the year 1891:

CITY OF PHILADELPHIA.

DEPARTMENT OF PUBLIC WORKS.

BUREAU OF LIGHTING.

CLASS F.

PROPOSALS

For furnishing electric arc lights during the year 1891.

To the Director of the Department of Public Works:

SIR:—The undersigned offers to furnish, during the year 1891, electric arc lights, as described in the following specifications, which are hereby made a part of this proposal, for the following prices per night, viz:

1. For each light by overhead wire on poles in the following district:

cents per light per night.

2. For each light on posts, and attached to underground cables owned by the City, on the following streets:

On Broad street, north of Callowhill street,

cents per light per night.

On Broad street, south of Market street,

cents per light per night.

On Diamond street, west of Broad street,

cents per light per night.

On Spring Garden street, east of Broad street,

cents per light per night.

On Spring Garden street, from Broad to Twenty-fifth street; on Twenty-fifth street, to Green street, and on Green to Broad street,

cents per light per night.

Name

Address

Philadelphia, 1890.

Specifications For Electric Arc Lighting.

1. Bids must be submitted in sealed envelopes, addressed to the undersigned, and endorsed "Proposals for Electric Lights."

2. Bids must describe by street bounds the part of the City to be covered, and include the lights already authorized by ordinance, and all that may be located during the year 1891, in the district covered by the contract made.

3. A current strength of not less than nine and six-tenth (9.6) amperes, and a voltage of not less than forty-seven (47) at the lamp must be maintained.

4. Tests of lamps and circuits may be made at any time by means of the Weston Standard Volt and Ammeters, at such testing stations to be established in each circuit as may be directed by the Chief of the Electrical Bureau, and any lights not up to the standard herein named will be rejected, and proper deductions made from the monthly bills.

5. Quarter frosted globes only will be used, and they must be kept clean.

6. Lamps not satisfactory to the Chief of the Electrical Bureau shall be changed, and others substituted within twenty-four hours of date of notice of the same.

7. The Department of Public Works (Bureau of Lighting) shall be advised of the number and location of the lamps on each circuit, and no lights beyond the registered capacity of the dynamo shall be attached to the wires furnishing the City lights.

8. The erection, position and maintenance of all lights shall be subject to the approval of the Director of the Department of Public Works.

9. The lights must burn from sunset to sunrise. Lights burning less than nine hours per night from September 1st to March 31st, or less than six hours per night from April 1st to August 31st, will not be paid for.

10. The failure of lights for two nights, except from unavoidable causes, of which the Director of the Department of Public Works shall be the judge, or any other violation of these specifications, shall be sufficient cause for the annulment of the contract.

11. Payments will be made monthly upon statement of the services rendered, and after approval of the bills by the Chief of the Electrical Bureau.

12. Bonds as prescribed by the ordinances of the City will be required for the faithful execution of the contract.

13. No bid will be considered unless made upon this blank, and accompanied by a certificate from the City Solicitor that the proposal bond required by law has been entered.

14. A certified check to the order of the Treasurer of the City of Philadelphia for five thousand (5,000) dollars must accompany each bid. This check will be returned at once to the unsuccessful bidder, but it will become the property of the City if the bidder to whom a contract is awarded shall fail to execute the contract or furnish by January 1, 1891, the lights to be contracted for. If satisfactory lights are furnished by January 1, 1891, and when the contract is finally executed, the checks will be returned to the successful bidders.

15. Bids are received and contracts awarded subject to an appropriation to be made by Councils, and the successful bidder must furnish the lights by January 1, 1891, even though a contract may not have been executed by that date.

16. The Director reserves the right to reject any and all bids, or to accept any portion of a bid, as he may deem best for the interest of the City.

LOUIS WAGNER,

Director Department of Public Works.

PHILADELPHIA, December 10, 1890.

The bids, under the foregoing specifications, were opened on December 20th, 1890, and developed the fact, that quite a number of new electric companies had entered the field of public lighting. As a result, the work, which had heretofore been done by seven companies, will be done in 1891 by eleven companies, who bid for the districts which they desired to light, thereby coming into competition with the older corporations.

The result was a reduction in the cost to the City averaging 5¾ cents per lamp per night, and amounting for the year 1891 upon the estimated number of lamps—1543—to over $32,000.00.

The price per lamp per night paid in 1887, when this Department was organized, was 54⅓ cents, as against 42 cents for the year 1891, showing a saving on this one item of over $80,000.

The following table is a schedule of the prices paid under the contracts for 1887, 1888, 1889 and 1890.

	1887.	1888.		1889.		1890.	
		No.	Price.	No.	Price.	No.	Price.
BRUSH ELECTRIC LIGHT COMPANY.							
South from the south side of Washington avenue between the Delaware and Schuylkill Rivers	59½ & 62½	41	54	61	54	79	52½
From the north side of Market street to the south side of Callowhill street, and the west side of Broad street to the Schuylkill River		18	47½	30	47½	41	45
From the south side of Market street to the north side of Washington avenue, and between the Delaware and Schuylkill Rivers	54	116	50	157	47½		
	50 & 52½	86	47½	102	45	307	45
All west of the Schuylkill River	55	69	50	91	50	110	50
UNITED STATES ELECTRIC LIGHT COMPANY.							
From the north side of Market street to the north side of Poplar street, and from the east side of Broad street to the Delaware River	50, 55 & 57½	94	50	140	49	165	48
PHILADELPHIA ELECTRIC LIGHT COMPANY.							
Bounded by the north side of Callowhill, the east side of Broad street, Erie avenue, Nicetown lane and Fairmount Park	50 & 55	86	47½	133	45	176	45
North side of Callowhill street to the north side of Poplar street, east side of Broad street to the east side of Eighth street	52½	26	49½	39	47½	46	47½
NORTHERN ELECTRIC LIGHT AND POWER CO.							
From the west side of Thirteenth street to the west side of Second street north of (not including) Poplar street to Venango street. East side of Second street to the Delaware river, and north from south side of Poplar street to Venango street	55	152	49	195	48	248	47½
WISSAHICKON ELECTRIC LIGHT COMPANY.							
Between Leverington avenue, Twenty-first Ward, and Allegheny ave., Twenty-eighth Ward, and from the Schuylkill River to the Township line.	No lights.	17	55	27	55	34	55
FRANKFORD ELECTRIC LIGHT AND POWER CO.							
Harrison to Mill street on Frankford avenue, Leiper street to Tacony road on Orthodox and Church streets, from Frankford avenue to Mill street on Paul street, or other streets in Frankford and vicinity	½ night 40	24	55	31	55	37	55
GERMANTOWN ELECTRIC LIGHT COMPANY.							
On such streets in Germantown as electric lights are now located, and such adjoining territory as the Department of Public Works may request us to light	55	27	55	39	55	50	55

1887, 524 lights, average price..... 54½
1888, 756 lights, average price..... 50⅜
1889, 1045 lights, average price..... 48½
1890, 1293 lights, average price..... 47¾
1891, 1543 (estimated) lights, average price..... 42

The following is a schedule of the number of electric lights, the price to be paid per light per night, and the cost of lighting the several districts during the year 1891:

	1891.	
	Number.	Price.
BRUSH ELECTRIC LIGHT COMPANY.		
From south of Callowhill street to the south side of Washington avenue, between Broad street and the Schuylkill River, including the bridges (except west end of South street bridge). From and including the south side of Market street to and including the north side of South street, from and including the east side of Eighth street to the Delaware River. Chestnut street between Eighth street and Broad street	223	42½
On Broad street, south of Market street to South street. Underground cable	9	40
South of Washington avenue, between Broad street and Schuylkill River	12	50
PHILADELPHIA ELECTRIC LIGHT COMPANY.		
From and including the south side of Callowhill street, to and including the north side of Poplar street, west from and including the west side of Eighth street	82	42½
West from and including the east side of Broad street, and north from Poplar street, including Girard avenue bridge	54	42½
Broad street, north of Callowhill street	40	40
Diamond street, west of Broad street	24	40
Spring Garden street, east of Broad street		40
Spring Garden street, from Broad street to Twenty fifth street, Twenty-fifth street to Green street, and Green street to Broad street	22	40
NORTHERN ELECTRIC LIGHT AND POWER COMPANY.		
North of Poplar street to Dauphin street, east of and including Thirteenth street to the Delaware River	168	45
North of and including Dauphin street to Erie avenue, east of and including Thirteenth street to the Delaware River	73	47
UNITED STATES ELECTRIC LIGHT COMPANY.		
From and including the north side of Market street to and including the north side of Poplar street, from and including the east side of Eighth street to the Delaware River. From and including the north side of Vine street, to south of Callowhill street west from and including the west side of Eighth street, to and including the east side of Broad street	144	42½
WISSAHICKON ELECTRIC LIGHT COMPANY.		
Manayunk, Wissahickon, Roxborough, and Falls of Schuylkill	34	55
GERMANTOWN ELECTRIC LIGHT COMPANY.		
Entire district of Germantown	50	55

	1891.	
	Number.	Price.
FRANKFORD ELECTRIC LIGHT AND POWER COMPANY.		
Bounded by Leiper street on the northwest, Bridge street on the northeast, and Frankford Creek on the southeast and southwest, being in the Twenty-third Ward.....	37	40
SOUTHERN ELECTRIC LIGHT AND POWER COMPANY.		
All lights within the district bounded by the south side of South street and the north side of Government avenue, between broad street and the Delaware River.....	150	30
Broad street, south of South street. Underground cable.....	8	30
THE POWELTON ELECTRIC COMPANY.		
All that portion of the City of Philadelphia lying west of the Schuylkill River known as West Philadelphia, being all of the Twenty-fourth Ward, the Twenty-seventh Ward, and the Thirty-fourth Ward. The boundaries of this district are the Schuylkill River on the east, Darby Creek and Cobb's Creek on the west and south, and City avenue on the north. Including west end of South street bridge	106	47
SUBURBAN ELECTRIC COMPANY.		
In all of the Thirty-fifth Ward, and that portion of the Twenty-third Ward lying north of Bridge street, in the City of Philadelphia.....		55
THE ELECTRIC POWER COMPANY.		
All lights within the district bounded by the west side of Eighth street, the east side of Broad street, the south side of Vine street, and the north side of South street, except Chestnut street.....	57	32½

For average price, see page 39.

The large reductions in cost of electric lighting is undoubtedly due to competition, but the result is not one of entire satisfaction. Under the present laws, contracts for lighting can be made but for one year, and whenever a contract is awarded to a new company it results in the erection of new poles upon which to string their wires. These increase the danger to the public, and the erectiou and duplication of the poles obstruct and destroy the sidewalks. The way out of these difficulties consists in the ownership, by the City, of the lighting plant, and if this is not possible, then in the ownership of the poles.

To obtain the needed relief action by Councils is necessary, and it is hoped that prompt legislation may be had upon the subject.

The first plan will save money for the City, and prevent the annual recurrence of the erection of a forest of new poles, and the second plan will at least do the latter.

LOCATING PUBLIC LAMPS.—The subject of the location of public lamps must again have attention. Progress in the direction of a better mode of procedure was made by the passage of the ordinance approved April 7th, 1890, authorizing the Department to erect lamps on streets newly opened, or authorized by Councils to be paved or repaved, subject to all the restrictions applicable to the erection of lamps specifically located by ordinance of Councils. Under this authority, 166 lamps were erected, and a knowledge by Councils of the satisfaction given to builders, and to other citizens, by the erection of these lamps as they were needed, and without awaiting the usual ordinance, would result in the adoption of a general ordinance placing this whole work under the control of the Department, subject to any restrictions deemed necessary. Lamps would then be erected whenever required and only where needed, and the annoyances to members of Councils, and to the citizens of Philadelphia, resulting from the delay, sometimes of a year, attendant upon the passage of the annual lamp ordinance, would cease.

The following extract, from the report of the Chief of the Bureau, illustrates another of the disadvantages of the present plan of locating lamps. If, however, this plan must continue, should not some one be charged with the duty of preparing an ordinance, which would result in the erection of more than 576 lamps out of a total of 915 lamps located?

The Chief says:

"There were located, by ordinance of Councils, approved April 10th, 1890, 915 gas lamps. Of this number 339 were not erected, for the following causes:

Located where there was no main pipe	149
" within 100 feet of lamp on same side of street	35
" directly opposite lamp up	22
" where lamps were already up	12
" within 100 feet of electric light	24
" where there were patent pavements	82
Locations could not be found	11
Repetitions in ordinance	4
Total	339

In connection with this subject, it should also be considered that the cost of printing and advertising the ordinance locating lamps, as required by law, amounts to at least $1500.00, whilst the actual cost of erecting the lamps, including cost of posts and lanterns, is only $13.34 each.

Bureau of Street Cleaning.

The work of this Bureau during the year 1890 has been of a satisfactory character, and that which was, not very long since, the weak spot in our City's condition (as it is now in so many other cities) is rapidly reaching a front rank in good and efficient service.

The number of complaints of all kinds was 2101—164 more than in the previous year; but this indicates rather a desire for greater cleanliness than increased neglect of duty. The complaints of non-removal of garbage were reduced to 675, as against 3237 for nine months of 1887, the year before this Bureau was organized.

BURNING GARBAGE.—The subject of destroying garbage and other offal by burning in furnaces especially constructed for such work, is named by the Chief of the Bureau in his report, as a question of immediate moment; but, under existing laws, contracts for this work can be made only for one year, and contractors will not build structures of this kind except at a cost to the City too great to be incurred. The City might and perhaps should erect and own them; but when there is not enough money to secure an ample supply of water, or for the extension of the gas works, or for better paved

streets, or for school houses, or for numerous other matters of like character, it is not probable that any will very soon be found for the building of garbage crematories.

If proper legislation to permit the making of contracts for the cleaning of streets, the removal of garbage, and for other similar work, could be made for a term not exceeding five years, the work would not only be done better, but also at a less aggregate cost than at the present time. Such a law did pass the General Assembly in 1888, but it was, unfortunately, vetoed by the Governor.

ANNULLED CONTRACT.—The most serious matter of the year, in connection with the work of this Bureau, was the failure of the contractor for the 2nd street-cleaning district, to comply with the provisions of his contract.

This district covers the business part of the City, and more than ordinary attention should be given to the work here. Repeated notices of neglect, and directions to prosecute the work with greater forces and to a better purpose, were utterly ignored, and after waiting for over two months, in the daily hope that the contractor would become alive to his duties and responsibilities, the contract was annulled, and, after advertisement, relet to new contractors at the cost and expense of the defaulting contractor, who has since instituted legal proceedings for damages.

The effect of this action upon all the contractors was of the most salutary character, resulting in much more and much better work.

INCREASED COST.—There has been no change in the number of, or in the salaries paid to, the officials of this Bureau, and the total expenditures last year were $1,078.92 less than in the year 1889.

For 1891, the contracts were, as usual, awarded to the lowest bidders after public advertisement, the awards amounting to $551,998.00, an increase of more than 25 per cent.!

It is expected that the contractors will improve their service to the same extent, and failing in this that they will be compelled to do so, if that hope is not realized.

Part of the increase is due to the increase in the number of houses from which ashes, garbage, etc., are to be removed, and to the extension of the streets, etc., to be cleaned, and part to the frequency with which extended portions of the City are required, by the contracts, to be cleaned, and it is hoped that citizens will promptly advise the Department of any neglect of duty by the contractors.

The full specifications under which the work is to be done during 1891 are as follows:

CITY OF PHILADELPHIA.

DEPARTMENT OF PUBLIC WORKS.

BUREAU OF STREET CLEANING.

PROPOSALS

For cleaning streets, inlets and public market-houses, and for the removal of ashes, garbage and dead animals, during the year 1891.

To the Director of the Department of Public Works:

SIR:—The undersigned make the following proposal for the cleaning of streets, inlets and public market-houses, and for the removal of ashes, garbage, and dead animals during the year 1891, in accordance with the annexed specifications, which are hereby made a part of this proposal, in the respective districts and for the sums named below.

It is understood and agreed that this proposal will hold good until an appropriation is made by the City Councils for the work to be done, and that the award to be made will be subject to such appropriation.

First District.—Comprising all that part of the City south of and including South street, from the Delaware to the Schuylkill Rivers, for dollars.
$ If cleaned by * machines,
dollars. $

Second District.—Comprising all that part of the City north of South street and south of Vine street, and including Vine street, from the Delaware to the Schuylkill Rivers, and all that part of the City lying west of the Schuylkill River, south of Market street, and including Market street, for
dollars. $
If cleaned by * machines,
dollars. $

Third District.—Comprising all that part of the City lying between Vine street and Poplar street, and including Poplar street, from the Delaware to the Schuylkill Rivers, and all that part of the City lying west of the Schuylkill River and north of Market street, for dollars.
$ If cleaned by * machines,
dollars. $

Fourth District.—Comprising all that part of the City north of Poplar street and east of Broad streat, and including Broad street, for dollars. $
If cleaned by * machines,
dollars. $

Fifth District—Comprising all that part of the City north of Poplar street and west of Broad street, for
dollars. $ If cleaned by *
machines, $

State increase of, or deduction from, above figures if the garbage removed is burned. dollars.
$ *(Name of machine to be used.)

Name,

Address,

and subscribed before me this
day of 189
[SEAL.]

—

Personally appeared before the subscriber
who, being duly according
to law, do hereby declare and affirm that
the only person
interested in this proposal, or in the contract proposed to be taken; that it is made without any connection with any other person making proposals for the same work, and is in all respects fair and without collusion.

INSTRUCTIONS TO BIDDERS.

(These instructions must be strictly observed.)

1. Bids must be made on blanks furnished by the Bureau of Street Cleaning, and must name a gross sum for the work to be done in a particular district.

2. Parties making bids must fill up the blanks both in writing and in figures, and give the name and address of all parties interested in the bid.

3. Bids must be sworn to by one of the bidders, in accordance with the form at the bottom of the preceding page.

4. Bids must be made separate for the work if done by hand or if done by machinery, and also a separate bid if the bidder desires to burn the garbage removed, in furnaces to be erected by the contractor, subject to the approval of the Director of the Department of Public Works.

5. A proposal bond, as prescribed in the laws governing the City, must be entered for each district bid for, and a certificate of such bond be appended to each proposal.

6. A certified check, to the order of the Treasurer of the City of Philadelphia, for five thousand (5,000) dollars must accompany each bid. This check will be returned at once to the unsuccessful bidders; but will be transferred to the City

Treasurer on account of the 10 per cent. required to be deposited by those to whom the contracts are awarded.

7. Bids will not be considered from any party in default under any previous contract with the City, and no party who is in default will be permitted to have any interest in any contract awarded.

8. Bidders, or their authorized agents, are expected to be present at the opening of the bids.

9. The Director of the Department of Public Works reserves the right to reject any or all bids as may be deemed best for the interest of the City.

LOUIS WAGNER,
Director Department of Public Works.

PHILADELPHIA, DEC. 1, 1890.

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SPECIFICATIONS.

Cleaning Streets, Inlets, and Public Market-Houses.

STREETS.

1. It is the purpose of these specifications that all the public highways (now opened or that may be opened during the year 1891), hereinafter called "streets," of the City shall be kept clean, and the contractor will be required to clean the same as often as may be necessary to secure that end.

2. Where the frequency with which the streets are to be cleaned is mentioned, the number of times named is the *mininum* and not the *maximum* of the work to be done.

3. Whenever the sweeping of streets would cause the dust to rise, they shall first be sprinkled by sprinkling wagons to be approved by the Director of the Department of Public Works, and the sprinkling shall be so done that the dust will not be turned into mud.

4. All hand sweeping shall be done with push-brooms, and all sweeping by machinery with machines approved by the Director of the Department of Public Works.

5. At least three men shall be constantly employed for the purpose of cleaning the streets covered with sheet asphalt surrounding the New City Hall.

6. Streets to be cleaned daily:

All streets between South and Willow streets, east of Second street, and including these streets.

All streets between Walnut and Willow streets, east of Broad street, and including these streets.

South street, from Delaware avenue to Broad street, Eighth street, from Willow street to Green street.

All streets paved with sheet asphalt.

7. Streets to be cleaned at least three times each week:

All streets between South and Walnut streets, east of Broad street, and including Broad street, except those named in paragraph 6; Broad street, from Willow to Columbia avenue; Market and Chestnut streets, from Broad street to Thirty-third street, and Second street, from Willow street to Poplar street.

8. Streets to be cleaned at least twice each week.

All streets between Washington avenue and Poplar street, east of Broad street, and including these streets, except those named in Paragraphs 6 and 7.

All streets between Washington avenue and Willow street, and including these streets, between Broad street and the Schuylkill River.

Green street, west from Broad street.

Broad street, from Washington avenue to Passyunk avenue.

Ridge avenue, from Broad street to Thirty-third street.

Front street, from Oxford to York street.

Kensington avenue, from York street to Lehigh avenue.

Frankford avenue, from Norris street to Lehigh avenue.

Germantown avenue, from Cumberland street to Gorgas lane.

9. Streets to be cleaned at least once each week:

Lehigh avenue, and all streets south of Lehigh avenue and east of the Schuylkill River, except those hereinbefore specified.

All streets between Lehigh and Allegheny avenues, and between Broad street and the Delaware River, paved or macadamized and built upon.

All streets between the Schuylkill River and Forty-third street, and Belmont avenue.

Ridge avenue, from Thirty-third street to Main street, and Main street to Green lane.

All streets in Manayunk and Roxborough, paved and built upon.

All streets in Germantown, paved and built upon.

All streets in Frankford and Bridesburg, paved and built upon.

10. All streets in the Twenty-first, Twenty-second, Twenty-third, Twenty-fourth, Twenty-fifth, Twenty-seventh, Twenty-eighth, Thirty-third, Thirty-fourth and Thirty-fifth Wards not included in the foregoing, paved or macadamized and built upon, shall be cleaned at least twice each month.

11. All streets contiguous to public, private, curbstone, or huckster markets shall be cleaned on each day when such markets are used and immediately after market hours.

12. All streets leading from depots or car stands of passenger railway companies shall be cleaned, for a distance of one thousand feet, at least twice each week.

13. During the time that cellar or other excavations are being made, the streets over which the excavated materials are being hauled shall be cleaned at least twice each week, for two squares from the place of excavating or loading, but any additional expenses for this extra cleaning may be collected from the party making the excavations.

14. All streets not otherwise specified shall be cleaned at least once each month.

15. Where streets are paved or repaired the surface shall be lightly brushed over at each cleaning. The surface sand shall be evenly distributed, the joints filled, and the dirt and surplus sand removed.

Within thirty days after such paving or repairing, or sooner, if ordered by the Director of the Department of Public Works, the sand remaining shall be entirely removed.

16. All streets paved and repaired with stone and pitch-cement joints shall be thoroughly cleaned within ten days after the completion of the paving.

17. All ashes, garbage, rubbish of any kind, or any material prejudicial to public health, thrown into the street, shall be promptly removed.

18. During the months of October and November, the accumulations of leaves in the public highways shall be removed not less than once each week.

19. All accumulations of sweepings, and of mud or rubbish removed from inlets or gutters, shall be removed within three hours from the time such heaps are made, in carts tightly built in such a manner that the contents can be removed without spilling or leaking, and the place where they had been collected shall be swept clean.

20. All gutters kept wet by the flow of filthy water or sewage shall be thoroughly scraped, brushed, and flushed at least twice each week from May 1st to November 1st, and for this work each contractor will be required to keep at least one hundred feet of hose in each district, and brushes or brooms, especially made for work of this kind, shall be used in cleaning the gutters.

All solid matter must be removed from the gutters and inlets before they are flushed.

21. The streets cleaned by the Board of City Trusts or by the Commissioners of Fairmount Park are not covered by these specifications.

22. All street crossings, inlets, gutters approaching the same, and all gutters necessary to drain crossings within one hundred feet of inlets, and streets in front of fire-plugs, for a radius of five feet, must be kept clean of dirt, mud, ice and snow.

23. All bridges, and gutters and footways on the same shall be kept clean of dirt, mud, ice, and snow, and when dangerous to public travel shall be sprinkled with sand or ashes, from which all coarse material has been removed.

Inlets.

24. All inlets must be cleaned at least twice each week in the territory where the streets are required to be cleaned twice each week or oftener.

Elsewhere, inlets must be cleaned at least once each week.

25. Inlets receiving drainage from market-houses or market-stalls shall be cleaned at least twice each week.

26. Immediately after the inlets are cleaned, water shall be run into them, and if they are not properly trapped, that fact must be at once reported to the Bureau of Highways.

Market-Houses.

27. All public market-houses shall be swept once a day, and when the thermometer is above the freezing point they shall be scrubbed with water at least twice a week, immediately after market hours.

Removing Ashes, Garbage and Dead Animals.

Ashes.

1. Ashes, sweepings and cut grass, that may be placed on the sidewalk in receptacles that can be lifted by one man, and in weight, with contents, not exceeding one hundred pounds each, and not exceeding three per week from one building, shall be removed at least once each week.

2. The contents of such receptacles shall be emptied into carts without spilling on the sidewalk, and the receptacle returned to the sidewalk without injury.

3. Kitchen garbage, offal or dead animals shall not be mixed with the ashes.

4. All the carts used for removing ashes shall be tightly built and provided with a canvas cover. They shall be so loaded that their contents cannot be scattered or blown away. While loading, one-half of the top of the cart shall remain covered, and when loaded the whole top shall be covered.

5. If streets are blockaded by ice, snow, or from other causes, the contractor is required to have the ashes and other matter to be removed, carried to the carts on the streets that can be travelled.

6. As provided by ordinance of Councils, approved July 1, 1879, ashes shall be removed from the territory bounded by Vine and South streets and the Delaware and Schuylkill rivers, between the hours of 10 P. M. and 6 A. M.

7. The contractor shall issue cards, to be approved by the Director of the Department of Public Works, giving his name and address, and stating the days for collecting ashes in particular streets or districts.

A copy of such card shall be left at each and every building in the district at least once in ninety days, and a supply of the same shall be kept at the office of the Bureau of Street Cleaning.

Garbage.

1. Kitchen garbage shall be called for and removed from all buildings occupied in whole or in part as dwelling-houses, except boarding-houses, public institutions, restaurants, or hotels, as follows:

During the months of January, February, March, April, November and December, three times each week.

During the months of May, June, July, August, September and October, six times each week.

2. The garbage shall be deposited in covered water-tight vessels, that can be easily and quickly handled and emptied by one man, and placed at points readily accessible to the garbage collectors.

3. Each garbage collector shall supply himself with a large water-tight bucket, make his rounds regularly in the district assigned to him, and frequently call out "Slop!"

4. The garbage to be removed shall be promptly transferred to this bucket, without spilling, and loaded into the garbage cart.

5. Carts for the removal of garbage shall be water-tight, strongly built, and kept thoroughly clean and well painted.

While in motion they shall have their tops entirely covered, and while being loaded, covered not less than one-half.

6. A bell of suitable size shall be attached to each garbage cart, or to the animal hauling the same, for the purpose of giving notice of its approach.

7. All garbage, except from boarding-houses, public institutions, restaurants, and hotels, shall be removed without charge to the householders.

8. The contractor shall issue cards, to be approved by the Director of the Department of Public Works, giving his name and address, and stating the days for collecting garbage in particular streets or districts.

A copy of such card shall be left at each and every building in the districts at least once in thirty days, and a supply shall be kept at the office of the Bureau of Street Cleaning.

Dead Animals.

1. Dead animals, lying on the public highways, must be removed within three hours from the time of discovery, and they shall be properly covered during removal.

General Regulations.

1. Contractors shall, within ten days after the award of the contract, deposit with the City Treasurer ten per cent. of the amount of the contract in cash, and also enter into a bond, as provided by ordinance, to be approved by the City Solicitor, in one-half the amount of their contract.

2. Each contractor shall have telephone connection with the Bureau of Street Cleaning, and shall be prepared to receive orders from said Bureau at any hour during the day or night.

3. Daily reports, in duplicate, on blanks to be furnished by the Bureau of Street Cleaning, shall be made to said Bureau of the streets cleaned, number of loads removed, and the number of men, vehicles and machines employed.

4. All carts or other vehicles used for the removal of street dirt, dead animals, ashes, or garbage, shall be legibly numbered and lettered, with the name and address of the contractor, and shall be constructed and maintained in a manner satisfactory to the Director of the Department of Public Works.

5. Any official or employé using improper language, being under the influence of liquor, or demanding payment for services rendered, except as herein allowed, shall be at once discharged and debarred from further employment on the work.

6. None but full grown men shall be employed on the work.

7. Ashes, dirt or rubbish made in manufacturing or building operations, or by or for any steam engine or steam boiler, except the boilers used for heating private houses with steam, and deposited on any street, shall be removed, but the cost of the removal must be collected from the builder or the person in charge of such business or building operations.

8. Water from the City fire-plugs may be used for the purpose of flushing streets, cleaning market-houses, gutters, and inlets, for trapping of inlets, and for the general work of street cleaning, without charge, but a permit must first be secured from the Bureau of Water, the contractor becoming liable for any damage done to the fire-plugs by his employes.

9. Each district shall include the full width of the streets forming the north and west boundaries of the district, and the entire length of all bridges upon such boundaries.

In case of dispute as to any street or bridge, the decision of the Director of the Department of Public Works shall be final.

10. The name and address of each party in interest in these contracts must be disclosed in the bid and entered in the written contract.

11. No transfer of the bid or assignment of interest, nor any substitution of any one not a bidder, nor any power of attorney to collect moneys due, will be recognized, and any violation of this specification shall be cause for the immediate cancellation of the contract by the Director of the Department

of Public Works, who may readvertise for the work at the expense of the defaulting contractor.

12. Failure to comply with any part of the contract, or of these specifications, shall be the authority of the Director of the Department of Public Works, without notice to the contractor, to employ sufficient force to have the work contracted for properly done, and to pay for the same out of the fund deposited as security by the contractor.

In addition to this payment, such amount as may be deemed an adequate penalty by the Director of the Department of Public Works may be deducted from the amount to be paid the contractor.

13. The Director of the Department of Public Works may at any time, for similar reasons and upon forty-eight hours' notice, annul this contract.

14. Payment for work done shall be made in monthly instalments, except for the months of January, February and March.

During these months one-half of the regular monthly instalments will be paid, but if on or before April 1st the whole district shall be cleaned to the satisfaction of the Director of the Department of Public Works, the amount retained from the payments will be paid.

If the streets are not so cleaned by that day, the amount retained shall remain the property of the City of Philadelphia.

The following is a comparative statement of the operations of the Bureau of Street Cleaning for the years 1888, 1889 and 1890:

The total Work done during the Year 1890, is as follows:

DISTRICTS.	CLEANED.					REMOVED.				Number of Complaints of all Kinds.
	Squares.	Inlets.	Crossings.	Market Houses.	Snow from Fire Plugs.	Number of Dead Animals.	Number of Loads.			
							Dirt.	Ashes.	Garbage.	
First	99,581	31,347	20,249	609	.....	768	48,644	73,655	9 245	209
Second	120,936	48,192	21,906	542	1	1,920	51,214	74,673	9,473	507
Third	81,081	33,836	12,840	210	207	3,255	34,638	89,280	11,349	467
Fourth	207,943	43,045	11,744	.....	.....	5,944	109,983	168,039	23,772	393
Fifth	56,682	21,399	12,393	.....	.....	387	22,352	52,357	11,095	525
Total, 1890	566,223	177,819	79,132	1,361	208	12,274	266,831	458,004	64,934	2,101
Total, 1889	473,829	180,764	27,161	2,471	386	11,393	256,572	413,631	59,593	1,937
Total, 1888	320,455	195,132	205,043	2,218	2,598	16,355	306,722	499,479	88,660	3,395

The following is a comparative summary of the expenditures for street cleaning for the years 1887, 1888, 1889 and 1890:

Years.	Amount.	Decrease.	Increase.
1887	$304,021 00		
1888	441,514 50		$137,493 50
1889	434,067 00	$7,447 50	
1890	432,988 08	1,078 92	
1891 (appropriation)	$563,920 00		

Other interesting tables are attached to the report of the Chief of the Bureau.

Bureau of Surveys.

The receipts and expenditures of this Bureau were largely in excess of those of any previous year.

The following is a comparative summary for the years 1887, 1888, 1889 and 1890:

Comparative Statement of Receipts.

Year.	Receipts of Bureau.	Receipts of District Surveyors.	Total.	Increase.
1887	$22,808 73	$4,891 46	$27,700 19	
1888	26,236 45	28,350 83	54,587 28	$26,887 09
1889	29,914 32	42,060 44	71,974 76	17,387 48
1890	30,018 49	65,177 63	95,196 12	23,221 36

Comparative Statement of Expenditures.

	1887.	1888.	1889.	1890.
Current expenses	$63,704 05	$86,658 23	$132,289 61	$101,540 33
For extensions	569,428 11	482,910 70	560,649 36	949,568 31
Total	$633,132 16	$569,568 93	$692,938 97	$1,051,108 64

DISTRICT SURVEYORS.—The increase in the former is caused by additional survey districts coming under the provisions of the law which requires that all the moneys received by District Surveyors be paid into the City treasury, and paying all these officials and their assistants fixed salaries. Nine survey districts have so far come under this law, either by expiration of the term of office for which the incumbents were elected by the people, or by death or resignation. The remaining four districts will become vacant on April 1st next.

The net profits to the City were $21,210.83. This sum will be increased by the additional four districts, and also by the yearly growth of the work done for property owners.

The following is a summary of the receipts and expenses of the District Surveyors, paid fixed salaries, during the years 1887, 1888, 1889 and 1890:

Summary of Receipts and Expenses of District Surveyors Paid Fixed Salaries.

Districts.	Surveyor.	Cash. Receipts.	Credit for Work done for the City.	Total Credit.	Expenses.				Balance profit to the City.	Profit to the City in 1899.	Increase.	Decrease.
					Salary.	Pay of Assistants	Miscel-laneous.	Total.				
First	Thomas Daly, 1 year	$7,237 97	$580 12	$7,818 09	$3,000 00	$1,805 88	$1,103 68	$5,909 56	$1,908 53	$4,500 65		$2,592 12
Second	Chas. W. Close, 9 mos.	4,484 75	986 86	5,471 61	2,250 00	1,260 00	1,338 52	4,848 52	623 09		$623 09	
Third	Wm. C. Cranmer, 9 "	8,206 72	1,267 31	9,474 03	2,250 00	3,653 16	1,126 54	7,029 70	2,444 33		2,444 33	
Fourth	Wm. W. Thayer, 1 year	4,510 45	2,200 34	6,710 79	3,000 00	2,234 45	1,112 49	6,346 94	363 85		363 85	
Sixth	Joseph Mercer, 9 mos.	7,112 61	925 45	8,038 06	2,250 00	1,005 00	782 90	4,037 90	4,000 16		4,000 16	
Seventh	Wm. K. Carlile, 3 "	1,132 07	803 59	1,935 66	625 00	616 65	328 67	1,570 32	365 34		365 34	
Eighth	C. A. Sundstrom, 1 year	4,351 97	2,714 20	7,066 17	3,000 00	2,780 00	1,223 21	7,003 21	62 96	192 20		129 24
Eleventh	Joseph Johnson, 1 "	9,449 92	2,303 61	11,753 53	3,000 00	2,906 00	1,137 66	7,043 66	4,709 87	3,601 46	1,108 41	
Thirteenth	H. M. Fuller, 1 "	18,691 17	1,235 47	19,926 64	3,000 00	7,858 65	2,335 29	13,193 94	6,732 70	6,513 67	219 03	
	Total, 1890, 9 Districts,	65,177 63	13,016 95	78,194 58	22,375 00	24,119 79	10,488 96	56,983 75	21,210 83	14,807 98	*9,124 21	2,721 36
	Total, 1889, 5 "	42,060 44	6,419 60	48,480 04	12,491 66	14,370 76	6,978 55	33,840 97	14,639 07	10,846 25	3,792 82	
	Total, 1888, 4 "	28,350 83	4,000 16	32,350 99	8,895 96	8,139 50	4,469 28	21,504 74	10,846 25	939 46	9,906 79	
	Total, 1887, 1 "	4,891 46	338 00	5,229 46	2,250 00	1,230 00	810 00	4,290 00	939 46			

*Net increase, $6,402.85

The expenditures for extensions were $388,918.95 more than in the year 1889, chiefly because of the increased construction of larger main sewers, but also by the increased number of bridges completed or under contract.

BRANCH SEWERS BY PRIVATE CONTRACT.—The building of branch sewers has decreased by reason of insufficient appropriation to pay for the City's share of the work.

Because of this want of money more than double the length of "private" sewers were constructed by owners of property in 1890 than in either 1888 or 1889. These "private sewers" are built under a sort of contract or agreement between the Bureau of Surveys and the owner of property, who, desiring to build houses, is unable to secure from the City the needed underground structures.

Under a decision of the Court of Common Pleas of this County, no assessments for sewers that may hereafter be needed, can be made upon properties abutting upon streets in which sewers have been built under this arrangement, and no matter how insufficient or how badly built the present structures may be, any improvements or enlargements must be made out of general taxation.

The amount paid by owners of property, for sewers built by the City is $1.50 per foot front upon each side of the street, the City paying any excess of cost over the $3.00 thus received, and collecting any excess of assessment over the cost. The contractors always take the assessment bills on account of the settlement of their contracts.

It is noticeable that the sewers generally built by property owners are those that cost less than $3.00 per lineal foot, and the result is that the City is not only put in possession of inferior work, but that only those sewers which cost more than the legal assesssment are built by the City.

Because of the frequent insufficiency of appropriation for branch sewers, it would be an improper burden upon persons desiring to improve vacant property by the erection of new houses, to stop entirely this building of "private sewers," but

all such work should be done under regular contracts, prepared by the Law Department, and executed by the Mayor, and the property owner.

Much satisfactory grading and paving of streets, without expense to the City, has been done under "private contracts," and an ordinance similar to those permitting such contracts should be passed for the building of branch sewers.

MAIN SEWERS.—A large portion of the appropriation for main sewers having been made for specific work, the Bureau was enabled to begin promptly in the spring, and to finish most of of that so begun before winter set in. It is important in the interest of good work, and of the convenience of the residents on the streets where such sewers are necessary, that appropriations be always made in that manner.

29,565 lineal feet of main sewers were built at a cost of $675,214.55, and 143,583 lineal feet of branch sewers at a cost of $359,097.70.

The total mileage of sewers is as follows:

YEARS IN WHICH BUILT.	BRANCH SEWERS.		MAIN SEWERS.	
	FEET.	COST.	FEET.	COST.
1887	$101,999	255,674 01	13,750	$235,753 10
1888	159,890	498,553 95	14,705	215,920 42
1889	162,037	432.414 91	25,640	348,206 49
1890	143,583	359,097 70	29,565	675,214 55

YEARS.	BRANCH SEWERS.		MAIN SEWERS.	
	MILES.	COST.	MILES.	COST.
Total sewers built to 1891	328.50	$4,114,261 37	72.18	$4,976,586 05
Built in 1887, 1888, 1889 and 1890	107.48	1,545,740 57	15.84	1,475,094 56

Nearly 33 per cent. of all the branch sewers and over 22 per cent. of all the main sewers have been built during the past four years.

Work has been continued, to the extent of the limited appropriations, upon three branches of the intercepting sewer. 160 new connections of dwellings, factories and other buildings were made during the year, and the total number of such connections is 774.

A number of property owners, refusing to make connections with the intercepting sewer, were cited before a magistrate, and on agreement to comply with the law, and the simple imposition of the costs of the suit, they were permitted to go free. The only case returned to court for trial is that of the Manayunk Paper Company, and it is hoped that conviction in this instance will render future legal proceedings unnecessary.

Work was continued upon all the main sewers in process of construction at the time of the report for 1889, and all but two are finished. They are as follows:

Clearfield street, from Thirteenth street to Connecting railroad.

Gunner's Run, northwest of Indiana and Rosehill streets.

Norris street, from near Germantown avenue to Ninth street.

Norris street, from Hope street to near Germantown avenue.

Norris street, from Susquehanna avenue to Hope street.

Somerset street, from Spring street to Aramingo Canal.

Somerset street, from William street and Delaware River through Richmond coal wharves to Somerset street and westward.

Susquehanna avenue, from the Delaware River to near Girard avenue.

Susquehanna avenue, from near Girard avenue to Norris street.

Tasker street, from Meadow street to Fifth street.

Twenty-fifth street, from Pennsylvania avenue to Parrish street.

Wingohocking, eastward from Penn street.

COHOCKSINK SEWER.—Work on the two sections of the sewer on Norris street, from Hope to Ninth street, will be completed early in 1891, finishing, at a cost of $288,927.00, a

sewer from the Delaware River, on Susquehanna street and on Norris street to Ninth street, a distance of 9700 feet.

This work is of incalculable benefit to the owners of property and to the residents on the line of the Cohocksink sewer and its extensions, from Germantown avenue and Second street to Ninth and Norris streets. This sewer was built to drain a comparatively limited territory, but by gradual extensions and additions it was required to carry the drainage from as far west as Laurel Hill Cemetery, and the natural results of an over-taxed structure, originally badly built, followed: breaks of the most serious kind after nearly every heavy fall of rain. Where the sewer did not break, the overflow from inlets and manholes filled cellars and even the first stories of houses.

It is not out of place to say that this sewer, 11 feet in diameter at Germantown avenue and Second street, in addition to all the branch sewers emptying into it, receives the discharge of a main sewer, 4 feet in diameter, at Third street and Germantown avenue, and is there reduced to 10 feet 6 inches in diameter; it receives a main sewer, 10 feet in diameter, at Thompson and Randolph streets, and is there reduced to 10 feet in diameter; it is then reduced to 9 feet on Montgomery avenue to Ninth street, and there to 8 feet; on Ninth street, below Norris street, it is increased to 9 feet in diameter, and the climax of practical engineering is reached at Ninth and Norris streets, where a sewer 13 feet in diameter is connected with it. The wonder is, not that it broke sometimes, but that it was possible to keep it from breaking all the time. It is proper to add that this work as constructed, was planned as long ago as 1856, in the expectation that appropriations would be made to build the sewer on Norris street. This was not done until 1889, when the sewer was at once begun.

The repair, or rather the rebuilding of the sewer, during the year 1889, was of such a character that no breaks of any kind occurred during last year, and when the work of rebuilding on Randolph street, above Columbia avenue, planned for 1891, is finished, and the new sewer on Norris street, east from Ninth

street, is completed and in full use, it is believed that the periodical breaks of the Cohocksink sewer will be things of the past.

OTHER MAIN SEWERS.—Work upon the following main sewers was begun and completed during the past year to the extent of the appropriations made:

Clearfield street, from Sixth street to Ninth street.

Tenth street, from Germantown avenue to Clearfield street.

Those upon which work was done during the past year, and which will be completed early in 1891, are as follows:

Courtland street, from Old York road to Broad street.

Mill Creek, from Market street to Haverford avenue.

Penn street, from Ridge avenue to Norristown Railroad.

Tasker street, from Fifth street to Thirteenth street.

Westmoreland street, from Clarion street to Aramingo canal.

The completion of the sewer on Somerset street, from the River Delaware west to the Aramingo Canal, gives an outlet to the Hart Creek sewer, and diverts all the drainage of the territory west to Second and Indiana streets, from the open Gunners Run, south of the Philadelphia & Reading Railroad (Richmond branch), direct to the river at William street.

This is the first of several sewers to be built on direct lines to the river, so that the unsightly and unwholesome condition of the Aramingo Canal, used as an open drain, need no longer exist. A sewer on Westmoreland street is in process of construction, and a contract for its completion in 1891 has been authorized.

BRIDGES.—Work was done during the year 1891 upon twelve bridges. Four of the five reported a year ago as under construction—one on K street, one on Frankford avenue, one on Kensington avenue, on the line of the Connecting railroad, and one on the line of Poplar street over the Philadelphia & Reading Railroad, are finished.

Work on the bridge over the river Schuylkill, on the line of Walnut street, is being rapidly pushed. Experiments with coffer dams, of novel construction for such deep water, caused

much delay, but the work is now progressing satisfactorily. All the trestle piers, 111 in number, are completed and ready for the iron work. One of the river piers is finished to low water, and the other and the two shore piers will be finished early in 1891.

A contract for the iron work of the west approach has been made with the Pottsville Bridge Company, and one for the east approach with A. & P. Roberts & Co. No appropriation has as yet been made for the main bridge structure, which, with the general work for completing the bridge, will cost about $400,000. With sufficient appropriation, the bridge could be ready for travel in the summer of 1892.

Bridges have also been built over the Connecting railroad at Pennypack lane, and over the Pennsylvania Railroad on the line of Thirty-fourth street. When the approaches on the north side are finished, this latter bridge will make a new and safe approach to the West Park.

Bridges of minor importance were built over Mill Creek, at Fifty-fourth and Supplee streets, and over Rock Run at Fifth and Ashdale streets, and a wing-wall was built to the bridge at Ridge avenue and Wissahickon Creek.

Two other bridges are under constructions —one on the line of the Connecting railroad at Twenty-second and York streets, and one on the line of McCallum street over Cresheim Creek.

A bridge on the line of the Norristown branch of the Philadelphia & Reading Railroad at Penn street is authorized, and will be built in 1891.

Comparative statement of work upon bridges during the years 1887, 1888, 1889 and 1890.

	1887	1888	1889	1890
Finished	9	2	4	10
Begun	1	1	5	2
Authorized		1	3	1
Planned		1	2	

The following is a comparative statement of the operations of this Bureau in the active construction of work during the years 1887, 1888, 1889 and 1890:

Summary of Bridges, Main, Branch and Private Sewers built during the years 1887, 1888, 1889 and 1890.

	1887.		1888.		1889.		1890.	
	No.	Linear feet.	No.	Linear feet.	No.	Linear feet.	No.	Linear feet.
Bridges	9		2		4		10	
Intercepting sewer (section)	2		1					
Intercepting sewer connections					5		3	5,473.00
Wissahickon Valley sewer (section)	2	17,213.62	2	13,710.28	2	25,640.53		
Storm water conduit, Falls Village	1							
Main sewers	6		16		15		20	24,096.00
Branch sewers	130	84,709.00	250	149,765.83	254	151,752.00	188	122,463.00
Private sewers	63	17,290.00	40	10,124.00	51	10,285.00	69	21,120.00
Total	204	*119,212.62	309	†173,600.11	327	‡187,677.53	280	§173,152.00

* 1887, equal to 22.578 miles. † 1888, equal to 32.879 miles. ‡ 1889, equal to 35.544 miles. § 1890, equal to 32.793 miles.

READING TERMINAL RAILROAD.—The Chief Engineer and Surveyor makes a lengthy report upon the subject of a depressed roadbed from Ninth and Green streets to Twelfth and Market streets, for the proposed Reading Terminal Railroad; but as that company has adopted a plan for the construction of an elevated road, which plan will probably have the approval of Councils, this admirable paper will be of use only as an evidence of what might have been.

REGISTRY BRANCH.—The work of the Registry branch of the Bureau of Surveys is shown by the following summary of its operations:

	1887.	1888.	1889.	1890.
Number of certificates registered owners issued	11,175	10,375	8,158	7,771
Number issued for use of the Law Department	400	209	337	477
Receipts from certificates of registered owners	$2,803 25	$2,617 00	$2,039 50	$1,948 00
Number of original lots plotted	9,039	8,503	11,868	12,478
Number of transfers registered	19,774	19,564	21,370	21,554
Number of plans made for use of City departments, bureaus, etc.	36	57	157	268
Number of examinations of registry plan books made by the public	17,700	18,717	19,547	20,521
Number of descriptions of property filed for registry	21,944	18,717	22,034	32,027
Number of titles perfected	1,512	1,665	2,091	1,705
Number of certificates of legal opening of streets, issued to bureaus, etc.	879	2 739	3,465	4,842
Number of certificates of registered owners in municipal lien cases for Law Department	526	412	1,383	2,468

The replacing of the worn-out record books, and the proper arrangement of the 525,690 descriptions of transfers of titles received since 1865, when the Registry Bureau was established, is progressing satisfactorily and will, when completed, be of great service to all requiring information upon titles to, and transfers of, real estate.

OTHER WORK.—Some matters of less importance in the operations of the Bureau of Surveys are named in the report of the Chief Engineer and Surveyor. One is the general introduction of an improved inlet to take the place of the unsightly openings now disfiguring and endangering our street corners; the other the systematic testing of the cements used in the construction of sewers. Until the past year, such tests were never made, and the rejection of large quantities brought to the work, as well as the knowledge that all cements would be subject to proper tests, undoubtedly brought about the use of better material.

The Chief Engineer and Surveyor deserves commendation for the promptness with which he put in practical operation the suggestions of the new inlets, the testing of the cements and also the filing of the descriptions of property transfers, which were being rapidly destroyed by continued use and by reason of the unsatisfactory shape in which they had been kept.

REORGANIZATION OF BUREAU.—The duties of the Bureau of Surveys are of a three-fold character: first, the surveying of properties and the marking of land lines; second, the filing and registering of transfers of real estate; and, third, the establishing of lines and grades and the construction of sewers and bridges.

None of these are dependent one upon the other, and they need not necessarily be under the care of the same officials. A man may be a thorough surveyor and be but indifferently successful in planning and executing engineering works of greater or less magnitude.

The work of the Registry branch of the Bureau of Surveys is of a clerical character, and neither the technical knowledge of a surveyor nor the planning of an engineer is required in its management. Draughtsmen and clerks only are needed there.

The City is divided into thirteen survey districts, and the surveyors of these districts constitute, with the Chief Engineer and Surveyor as President, a Board of Surveyors, which passes

not only upon questions of surveys and land lines, but upon all engineering operations.

The result is divided responsibility and consequent unsatisfactory work. Sewers are even now being built which empty into others of a less diameter, just completed; and when inquiry is made as to the reason for such work, the reply is that the Surveyor of a particular district has so planned it, and that the other members of the Board do not wish to interfere with his work. Equally unsatisfactory action is had in the actual construction of public works planned, all of which would be remedied if these matters were placed under one responsible head.

In view of the fact that the five years for which the Chief Engineer and Surveyor was elected by Councils in March 1887, will expire on April 1st, 1892, and that after that date the appointment will be made by the Director of the Department of Public Works, it would be proper for the Councils of the City to consider the expediency of separating the incongruous and often conflicting duties of this Bureau into their natural divisions, and to establish, in addition to the Bureau of Surveys, a Registry Bureau and a Bureau of Engineering. By proper reorganization of districts and of the office staff, few if any more officers would be required, and the possible increase of salaries to be paid the chiefs of the new bureaus would be more than justified by the better work.

Under the law, Councils have the power to reorganize any of the (former) departments, now bureaus, of the City government; and the reorganization above suggested could be put into practical operation without interfering with the duties of the Board of Surveyors, so far as they are fixed by Acts of Assembly, relative to street and property lines.

With such a sub-division of duties in the Bureau of Surveys, the several branches of the Department of Public Works will then be established in accordance with the legitimate work appertaining to each.

The reason this reorganization was not recommended in previous reports was because the Chief Engineer and Surveyor was elected but a few days before the Department of Public Works was organized.

Bureau of Water.

The most notable feature of the report of the Bureau of Water is the startling increase in the quantity of water pumped.

Considered from either the standpoint of the total pumpage or the quantity per capita, this subject should have immediate consideration by Councils.

Compared with the report of ten years ago, we have the following:

	Total pumpage.	Per Capita per day.
1890,	51,698,508,699 gals.	131 gals.
1880,	21,120,792,386 "	68 "
Increase,	30,577,716,313 "	63 "

WASTED WATER.—No one will pretend to believe that this represents water actually consumed, for either household or manufacturing purposes, and that in 1890 there should be required 131 gallons per day, or 63 gallons per day more than in 1880, for every man, woman and child in Philadelphia. On the contrary, everybody must be satisfied that these figures represent a flagrant waste of water.

An ample supply of water should be furnished for all necessary uses, for all the conveniences of modern life, and for manufacturing enterprises of any and of all kinds, but a wilful and careless waste of any property, public or private, must be condemned.

The remedy for this evil can certainly be found, and Councils should, by proper legislation, put the Department in a position to protect the taxpayers of our City, even against themselves and against their own wastefulness.

Unless some action is taken at an early day to keep the use of water within reasonable bonds, it will be practically impossi-

ble to keep up the daily supply in time of greatest consumption, much less to secure funds for the costly and necessary structures by which to furnish water of better quality.

METERS.—To check, to even a limited extent, the great waste evidenced by the foregoing figures, the Department has introduced, during the past year, 270 water meters, the total now in use being 522.

The rents received from these meters amounted to $49,168.82, whilst the assessments, per schedule rates, would have been but 14,328.39.

If meters were attached to the supply mains of all large consumers, economy in the use of water would be the rule, where it is now the exception. The quantity used would be materially less, but the receipts by the City would be much greater than now, justifying a reduction in the price charged—60 cents per 1000 cubic feet.

ILLEGAL CONNECTIONS.—During the year, the Inspectors found that many plumbers and other persons had made unauthorized connections with the City's mains. Several offenders were cited before a Magistrate and fined, whilst other cases were dismissed upon payments of the costs and the proper charges for the additional connections made.

A reinspection of the First Ward is now being made. This work will be continued throughout the City as rapidly as the current business of the Bureau will permit.

The facts developed, as far as the work has gone, justify the belief that a general reassessment would increase the receipts from water rents at least ten per cent.

INCREASED RECEIPTS, ETC.—The increase in receipts, whilst large, has not kept pace with the increase of water consumed, the latter being 145 per cent., and the former only 60 per cent., follows:

1890	$2,381,037 70
1880	1,484,375 06
Increase	$895,680 64

The report also shows that the pumpage of 1890 is sixty per cent. and the amount of pipe laid thirty-three per cent. greater than in 1887. The receipts are but $350,603.09 (fifteen per cent.) greater, but the current expenditures are $19,004.13 less.

The following is a comparative summary of the operations for the years 1887, 1888, 1889 and 1890:

	1887.	1888.	1889.	1890.
Receipts from water rents	$1,721,488 83	$1,793,432 38	$1,848,542 49	$1,958,551 95
" " fractional rents	115 939 21	113,550 16	143,394 73	171,901 15
" " water-pipes	106,602 48	133,667 85	149,611 63	141,884 27
" " City Solicitor's office	29,504 04	22,846 97	33,043 09	38,367 73
" " penalties	24,453 03	23,584 86	24,247 95	26,270 94
" " delinquent rents	19,040 87	13,995 04	23,407 23	25,472 39
" " Ch'f Engineer's office	7,287 61	7,742 45	11,363 70	9,730 83
" " searches	3,412 75	4,158 25	5,056 25	5,235 75
" " delinquent penalties	2,705 79	1,948 54	3,332 78	3,622 69
Total	$2,030,434 61	$2,114,926 50	$2,241,999 85	$2,381,037 70
	Gallons.	Gallons.	Gallons.	Gallons.
Pumped to reservoirs	32,426,779,765	37,068,763,428	42,518,919,781	51,698,508,699
Equal to gallons pumped 100 ft. high	51,289,948,331	59,483,831,199	69,034,118,434	84,501,451,686

NOTE.—The "pumped to reservoirs, etc.," includes 1,424,612,221 gallons of repumpage to higher levels at Mount Airy, Roxborough and East Park Reservoir. This deducted from the total pumped gives 50,273,896,478 gallons as the total consumption.

The cost of pumpage is calculated on the total pumpage and the consumption per capita on the smaller quantity.

	1887. Gallons.	1888. Gallons.	1889. Gallons.	1890. Gallons.
Pumped by water power	10,105,736,633	11,241,113,108	11,413,836,469	12,362,987,130
Pumped by steam power	22,321,043,132	25,827,650,320	31,105,083,312	39,335,521,569
Largest quantity pumped in 24 hours	118,604,079	138,674,777	148,966,334	170,600,577
Smallest quantity pumped in 24 hours	61,232,735	53,636,138	47,642,722	61,956,522

Year.	Average consumption in gallons per capita per day estimating the population at*	Increase of	Increase per capita per day.	Cost per 1,000,000 gallons pumped 100 feet high.	Reduction in cost of pumpage per 100,000,000 gallons.
	Gallons.	Gallons.	Gallons.		
1887	89	3,767,813,196	9	$3 99	14 cents.
1888	100	4,641,983,663	11	4 49	†50 cents.
1889	110	5,450,156,353	10	3 87	62 cents.
1890	131	9,179,588,918	21	3 05	82 cents.

* 1887— 995,000.
1888—1,020,083.
1889—1,050,000.
1890—1,046,964. U. S. Census.

† Increase in cost of pumpage.

Expenditures.

	1887.	1888.	1889.	1890.
Current expenses	$731,501 50	$702,776 39	$708,847 53	$712,497 37
For extensions	295,440 09	491,131 01	605,658 57	280,866 92
Total	$1,026,941 59	$1,193,907 40	$1,314,506 10	$993,364 29

The cost of pumping one million gallons, lifted 100 feet high, was $3 05, or..... 82 cents less than in the previous year and..... $2.46 less than in 1880.

Twenty-five per cent of the total pumpage was by water power, the turbine wheels using..... 370,889,613 900 gallons.
To pump..... 12,362,987,130 "

Only 3,181,761,520 gallons, or 6 per cent. of the total pumpage, was from the Delaware River.

No pumping was done at the Kensington Station after January, 1890. The engine formerly in use there is now in operation at the Spring Garden Station.

PUMPING CAPACITY.—There has been no increase in the pumping capacity, which is, theoretically, 185,290,000 gallons in 24 hours. At the Spring Garden Station, the theoretical

capacity was exceeded almost daily during the months of July, August, September and October.

This condition of affairs is, of course, undesirable, but partial relief will come by the erection, at the Spring Garden Station, of a pump with a capacity of 20,000,000 gallons daily, which has been authorized by the appropriation for 1891.

The old Cornish engine at Roxborough Station, which has not been in use for many years, has been sold for old iron, and will be removed during 1891. A new engine of greater capacity and of modern construction is needed at this place.

The following statement gives the number and type of engines, and their several aggregate capacities at the various stations.

Pumping Station.	Designated number of Engine or Turbine.	Type of Engine.	Designed Capacity in Million Gallons per day.	Total.
Spring Garden. Old Station	6	Simpson Compound Rotary	10,000,000	
"	7	Marine Compound Rotary	20,000,000	
"	8	Worthington Duplex	10,000,000	
"	11	Gaskill	20,000,000	
"	12	Worthington Duplex	6,000,000	
New Station	9	" "	15,000,000	
"	10	" "	15,000,000	96,000,000
Belmont	1	Worthington Duplex	5,000,000	
"	2	" "	5,000,000	
"	3	" "	8,000,000	18,000,000
Roxborough	1	Cornish Overhead Beam	2,250,000	
"	2	Worthington Duplex	5,000,000	
"	3	" "	7,500,000	14,750,000
Roxborough Auxiliary,	1	Knowles' Pump	500,000	
" "	2	" "		500,000
Mt. Airy	1	Davidson Pump	1,000,000	
"	2	" "	1,000,000	2,000,000
Chestnut Hill	1	Knowles' Pump	250,000	
" "	2	Worthington Duplex	500,000	750,000
Frankford	1	Mairne Compound Rotary	10,000,000	
"	2	Corliss Compound Rotary	10,000,000	20,000,000
Fairmount. New House	1	Turbine Wheels	2,000,000	
"	3	" "	5,330,000	
"	4	" "	5,330,000	
"	5	" "	5,330,000	
Old House	7	" "	5,100,000	
"	8	" "	5,100,000	
"	9	" "	5,100,000	33,290,000
Total				185,290,000

PIPE LAYING, ETC.—

The number of permits issued during the year was.....	8,330
The number of premises supplied with water is.....	181,084
The number without water is.....	13,504
The total pipe laid is.....959 miles 2813 feet	
Of which 159,176 feet or.....30 miles 776 feet	
was laid during the past year, and during the preceding four years	
563,789 feet equal to.....106 miles 3011 feet.	

Included in the work of the past year was a 48-inch pumping main, from the Spring Garden Station to the East Park Reservoir, and the completion of the 48-inch main, on York street, to the Kensington District.

The 48-inch pumping main from Fairmount Pumping Station to the Corinthian Reservoir, in use for over 25 years, broke and was promptly repaired.

The inspection of all the pipes now used by this Bureau, as well as those used by the Bureau of Gas, is of the most exacting character, and resulted, in 1890, in the rejection of 4,350 pieces, out of 23,829 pieces of water-pipe inspected.

The appropriation for service pipe was, as usual, insufficient for the demand, and in anticipation of its exhaustion an ordinance was passed on June 19th, 1890, permitting property owners needing pipe in their building or other operations to buy the pipe and pay for laying the same. To prevent possible loss to the City, they were required to pay, in addition, 50 cents per foot front of the property where such pipe was laid, that sum being the average profit on the pipe laid by the City.

Under this ordinance, a large amount of pipe was laid, increasing the total laid 12,005 feet over the length laid in 1889; but the amount received for frontage charges was $7,727.36 less. This sum was, however, more than offset by the reduction in the expenditures by the City for purchase and laying of pipe.

The pipe furnished by owners of property was laid by the City's employés, and was subjected to the regular inspection.

It is a pity that the City is compelled to adopt so many makeshifts because of these continued and repeated deficiencies in funds.

The following is a comparative statement of the total pipe laid, and of other work done during the past four years:

YEAR.	PIPE LAID.			* PIPE RELAID.	FIRE HYDRANTS PLACED IN POSITION.			SUBSTITUTED FOR DEFECTIVE HYDRANTS.			Fire Hydrants in use.	Water Attachments.
	Feet.	EQUAL TO.										
		Miles.	Feet.	Feet.	New Style	Old Style.	Total.	New Style	Old Style.	Total.		
1887	122,790	23	1,350	7,858	429	.....	429	150	72	222	6,715	8,532
1888	133,552	25	1,552	19,026	559	21	580	187	102	289	6,929	8,788
1889	147,171	27	4,611	21,577	513	8	521	213	69	282	7,433	9,544
1890	159,176	30	776	33,242	619	3	622	243	25	268	7,749	10,081

Total pipe laid 959 miles 2810 feet.

* Adds nothing to feet in ground.

CONSTRUCTION AND REPAIR SHOP.—The operations of the construction and repair shop have grown with the increased work of the Bureau. The report of the Superintendent gives a detailed statement of the new appliances manufactured and of the repairs made.

The balance to "credit" for this year is $5,635.61, which, however, represents but a small portion of the benefit which the shop is to the City; the output is of better quality and is more readily secured than from private establishments, and the saving in time is frequently greater than the actual cash profits.

OTHER WORK.—All the work at the several pumping stations was of the usual routine character incident to large operations.

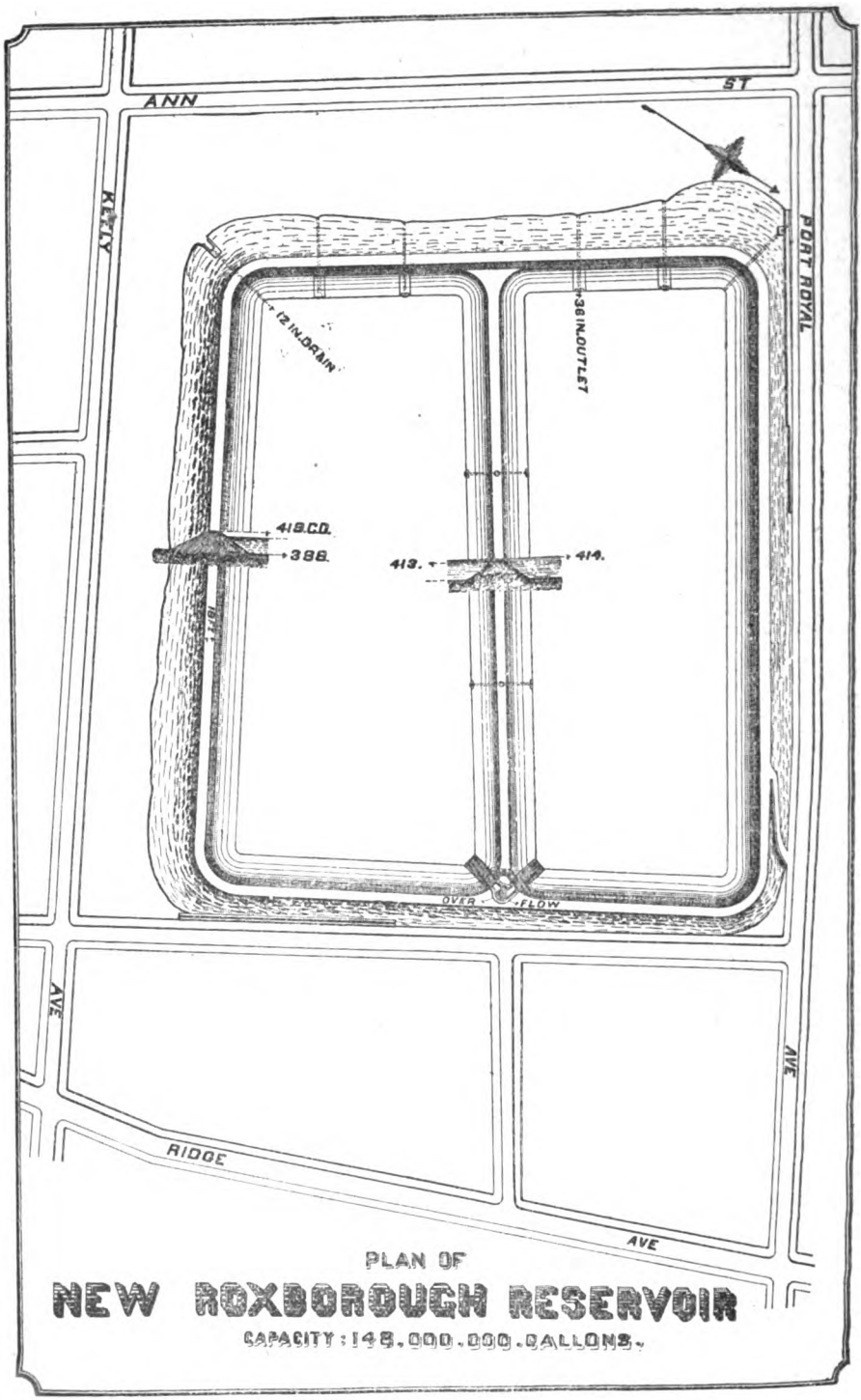
The dam at Fairmount was thoroughly overhauled, rotten timbers removed, cribs refilled and replaced, and the whole structure placed in good condition. This work had been delayed for several years: first for want of funds, and then because of the extraordinary high water in the river.

Electric light plants were installed at the Roxborough and Frankford Stations, to replace the lighting by coal oil.

RESERVOIRS.—The new reservoir at Roxborough is under contract and in process of construction. When completed, in 1892, it will secure to the people of Falls of Schuylkill, Manayunk, Roxborough, Chestnut Hill, Mt. Airy and Germantown a full supply of subsided water.

It is located on Port Royal Road, west of Ridge avenue, 9 miles from the City Hall, at an elevation of 419 feet above city datum. It covers 35 acres, and its two sections have a capacity of 148,000,000 gallons.

The following is a copy of the plan of this reservoir:



Enough ground is reserved for the construction of filter beds, whenever money is appropriated for that purpose.

The building of another reservoir, to be located on Indian Queen lane, from which the whole northwestern part of the City, comprising the Fifteenth, Twenty-eighth, Twenty-ninth, Thirty-second and portions of the Twentieth and Thirty-third Wards, is to be supplied with subsided water, is now being considered by the Committee on Water. Favorable action is hoped for, so that a limit may be placed to the time during which this important and growing portion of Philadelphia is to be supplied with water by direct pumpage from the Schuylkill River, or the City put to the annually increasing cost of repumpage from the East Park Reservoir.

The quantity of water thus repumped during 1890 was 988,997,176 gallons.

The following is a statement of the location, date of completion, elevation and capacity of the City's reservoirs:

Name of Reservoir.	Location.	Date of completion.	Height above City datum.	Capacity in gallons.
Fairmount.				
Reservoir No. 1	East Fairmount Park	1815	94	26,350,800
" " 2		1821		
" " 3		1827		
" " 4, Section 1		1835		
" " 4 " 2		1836		
" " 4 " 3		1836		
Lehigh.				
Section 1	Sixth and Lehigh avenue	1852 and 1871	114	26,394,000
" 2				
" 3				
Spring Garden	Twenty-sixth and Master streets	1844	120	12,000,000
Corinthian	Corinthian avenue and Poplar street	1852	120	37,341,400
East Park.				
Section 1	East Fairmount Park	1887	133	62,737,632
" 2		1888		306,400,622
" 3		1889		304,736,360
Frankford	Oxford Turnpike and Comley street	1877	167	36,046,000
Belmont	West Fairmount Park	1870	212	39,758,000
Mount Airy	Allen's lane and Mower street, Germantown	1851	363	4,546,000
Roxborough	Ridge and Shawmont avenues	1866	366	12,838,000
Manatawna tanks—2	Manatawna and Ridge avenues	1878	442	100,000
Chestnut Hill tank	Hartwell avenue and Chestnut Hill Railroad, Chestnut Hill	1860	481	40,000
Total				869,288,814

EXTENSIONS.—The recommendations made a year ago have been partly met by the appropriation for the new engine at the Spring Garden Station, the new reservoir at Roxborough, and the laying of new and large mains in West Philadelphia, in Germantown, for the supply of the Twenty-sixth and Thirtieth Wards and for the northwestern part of the City, all of which work is under contract and in process of execution.

The others are here repeated:

For more pumping engines, especially at Frankford Station and at Roxborough Station.

For a new reservoir on Indian Queen Lane and, at an early day, additions to the Wentz Farm and Belmont Reservoirs.

For additional large mains in various parts of the City, and, after sufficient money has been provided for an adequate supply of water, its qualities should be increased by the construction of filter beds.

The profits from water, showing in 1890 a balance of $1,668,-540.33 over current expenses, if set apart for the above works, would be ample in a few years not only to complete them but to bring water by gravity from distant mountain streams.

The amount expended in 1890 for "extensions" was, however, only $280,866.92, the balance of the moneys earned passing into the general funds of the City, thereby reducing the tax rate nearly thirty cents per $100 of valuation for taxation.

The total receipts from the Bureau of Water during 1887, 1888, 1889 and 1890 were		$8,768,398.66
Current expenditures,	$2,855,622.79	
For extensions,	1,673,096.59	
Total,		4,528,719,38
Net profits in four years		$4,239,679.28

Showing such results, this branch of the City's service deserves more funds for new work of such vital importance to the people of Philadelphia. It is folly for those who have the

power to levy taxes, or for those whose privilege it is to pay them, to complain of an inadequate supply of water or of a supply of poor water, and to criticise the executive branches of the City's government. If Councils will furnish the money, the Department will supply the water.

NEW WATER SUPPLY.—The hydrographic branch of the Bureau of Water continues its collection of the statistics of rainfall at eight regular and eleven volunteer stations. The data gathered, and the surveys and inspections heretofore made by the City's engineers, will enable the Department to submit, within any reasonable time, plans for the future permanent water supply of our City. But so long as the time of Councils is taken up by a series of water schemes, whose greater or less intrinsic merit is always overshadowed because of diverting large sums of money from the City treasury, without adequate return, the Department can only continue its present work of increasing the pumping and storage and subsiding capacity.

The time will come when it will be found that all that is needed to be done can be done by the City, without the intervention of either capitalists or of promoters of joint stock companies.

The total rain-fall in 1890, as marked at the station located at Thirty-second and Spruce streets, was 34.68 inches, sixteen inches less than during 1889.

Notwithstanding this decrease, the flow of water in the Schuylkill River was ample for all purposes.

The gauges at Fairmount dam show that there
flowed to waste over the flash boards of the dam....184,603,271,645 gallons.
The largest quantity being in March..... 39,928,443,009 "
And the smallest in July..... 6,155,686,009 "
In addition to this.....370,889,613,900 "
were used in the pumping by the turbine wheels.

These figures do not differ materially from the average flow of many years, and show that the Schuylkill River is ample in volume for the City's water supply.

Whenever money is found for a supply taken from points farther removed from the causes of pollution, locations for impounding reservoirs can be found in the watersheds of the river and of the water courses subsidiary to it. The water there impounded must then be brought in aqueducts, having no connection with the courses of these streams, to the reservoirs now in use or to be built, and from there distributed to consumers, without expense for pumping.

Repeated analyses of the water, made by different experts, and without previous knowledge on their part as to where the water sent them came from, show no material deterioration in its quality. They also prove, what has always been claimed, that the water at the Fairmount and Spring Garden Pumping Stations, is better than that pumped at Flat Rock.

This is due to subsidence in the river and in Fairmount Pool, between these points, and because a very large proportion of the sewage of Manayunk and Falls of Schuylkill is carried to the river below Fairmount Dam, by the intercepting sewer and its connections.

The report of the Chief of the Bureau on these points deserves careful consideration.

Flat Rock Dam.—The Schuylkill Navigation Company claims that all the terms of their agreement with the City, made on June 14th, 1824, have been complied with, and that the leases of water-power made by them all contain the clause referring to the non-pollution of the water of the River Schuylkill, between Flat Rock Dam and Fairmount.

On August 16th, word was received from the Roxborough Pumping Station that the employes of the Navigation Company had opened the sluices of Flat Rock Dam, and that in a very few hours the pool from which a very large portion of the City is supplied with water would be emptied.

It being Saturday, no officers of either the Navigation Company, or of the Railroad Company, lessees, could be found, and no amicable arrangement for preventing the serious calamity

of a failure in the water supply of more than 90,000 people, seemed possible.

After much search, a Judge of our Court of Common Pleas was found, who promptly granted an injunction for five days, and perpetual until hearing, restraining the Navigation Company from its work.

Armed with the writ, and with a detail of police officers in reserve, the officers of the Department went to Flat Rock Dam and persuaded the chief engineer of the company, who was superintending the work of the alleged repairs, to close the sluices, upon condition that the City would pay any additional expense incurred by his company by reason of the stoppage of the work.

Before the flow of water was stopped, the river became so low that pumping was stopped from 4 P. M. until midnight.

The repairs were subsequently made without interfering with the water supply, and without any expense to the City.

This incident shows the importance to the City of securing the ownership of the present dam, or of building another nearer the pumping station.

We are now at the mercy of the floods, and of adverse, even if not antagonistic, ownership. Absolute control of a dam, and of the pool of water formed by such a dam, is as vital here as at Fairmount, where the Belmont, Spring Garden and Fairmount Pumping Stations are dependent for their water supply upon the dam purchased by the City from the Navigation Company nearly seventy years ago.

New Work in 1891.

The improvements and extensions planned for 1891, and for which appropriations have been made by Councils, may be summarized as follows:

Bureau of Gas.

At the 26th Ward Works.—Rebuilding a stack of 3's with a stack of 6's of the Fleming half-regenerative system, thereby increasing the manufacturing capacity of the stack from 400,000

cubic feet to 1,400,000 cubic feet per day, and an exhauster, engine and boiler.

At the 9th and Diamond streets Holder Station.—Adding a third lift to each of the holders, thereby increasing their capacity of 1,000,000 cubic feet to 1,500,000 cubic feet each, and a new exhauster, engine and boilers.

New mains as follows:

A 12-inch main on Thirty-fourth street, from Market street to Walnut street.

A 12-inch main on Fortieth street, from Market street to Walnut street.

A 12-inch main on Montgomery avenue, from Sixteenth street to Twenty-seventh street.

A 20-inch main on Twenty-second street, from York street to Venango street.

A 20-inch main on Mifflin street, from Broad street to Sixteenth street.

A 30-inch main on Sixteenth street, from Columbia avenue to York street.

Bureau of Highways.

Repaving, to the extent of the appropriation of $500,000, such streets, not occupied by passenger railway tracks as may be designated by ordinances of Councils.

No appropriation has been made for repaving streets occupied by passenger railway tracks.

Bureau of Lighting.

Erect additional public lights, gasoline, gas and electric arc, at such points as may be designated by ordinance of Councils, to the extent of the appropriation made for that class of work, say 1,000 gasoline lamps, 1,000 gas lamps and 300 electric lights.

Bureau of Surveys.

Continue work on the Walnut street bridge, on the river piers and on the iron work of the east and west approaches and on the main sewers.

Bureau of Water.

At the Spring Garden Pumping Station: erect a 20,000,000 gallon pumping engine.

Continue work on the new Roxborough Reservoir.

Lay new mains as follows:

A 20-inch main on Montgomery avenue, from Twenty-seventh to Twenty-fourth street; Twenty-fourth street, from Montgomery avenue to Norris street; Norris street, from Twenty-fourth to Broad street.

A 20-inch main on Haverford avenue, from Thirty-fifth street to Lancaster avenue.

A 20-inch main on Wissahickon avenue, from Allens lane to Rittenhouse street.

A 16-inch main from Rittenhouse to School street, and on Rittenhouse street from Wissahickon avenue to Pulaski avenue.

A 30-inch main on Bainbridge street, from Broad street to Front street.

A 36-inch main on Twenty-seventh street, from Thompson street to Ridge avenue; on Ridge avenue, from Twenty-seventh to Twenty-ninth street; Twenty-ninth street, from Ridge avenue to York street.

A 36-inch main on Fifty-second street, from Walnut street to Baltimore avenue, and a 30-inch from Baltimore avenue to Woodland avenue.

A 48-inch main from Thirty-third and Master streets to Twenty-fifth and Spring Garden streets, to supply the territory below South street from the East Park Reservoir.

SUGGESTIONS.

The following suggestions of new work and extensions, and for additional legislation, or for the modification of ordinances now in force, are submitted for your consideration:

Director's Office.

There should be more general and less special legislation by Councils.

At present, not a public light can be erected, not a gas, water or drain pipe laid, not a street graded, paved or

repaved, not a sewer or a bridge built, without the passage of a special ordinance for each particular piece of work.

All these things could be done, and, with all due respect to Councils, done better, by the executive branches of the City government than by the legislative. Councils should pass general ordinances regulating all these subjects, imposing whatever restrictions and making such regulations as may be deemed wise, and then the Department can do the work to the extent of the moneys appropriated, and do it promptly.

Bureau of Gas.

The supply of gas is insufficient in West Philadelphia, and a new holder station should be established at the lowest point in that district, on the river Schuylkill on the Almshouse property.

This would require the erection of a holder, the building of an exhaust engine and boiler house, with the requisite machinery.

When this holder is finished, a large supply main must connect it with the holders of the Ninth Ward Works, and large distributing mains must be laid throughout the Twenty-fourth, Twenty-seventh and Thirty-fourth Wards.

Appropriations should be made for rebuilding the old stacks at the Twenty-sixth Ward Works, and also for the erection, at that point, of a water-gas plant, with a view to the early abandoning of the works at Market street and the Schuylkill River, for purposes other than as a holder station.

All gas now furnished free to the several City departments should be paid for, and the Bureau of Gas should pay for all water furnished it by the Bureau of Water.

Bureau of Highways.

The ordinance regulating the grading, paving and curbing of sidewalks should be revised, as indicated in the report of that Bureau.

Streets should be paved and repaved for greater distances than at present. Patch-work, except in crazy quilts, is generally unsightly and always bad.

Annual appropriations should be made for the repaving of streets occupied by passenger railway tracks, until the companies owning the tracks will do this work themselves.

Even at the risk of reiteration: if these companies are liable for this work, they will eventually be compelled to pay for its cost, with legal interest, and if they are not liable, the City is liable, and should do the work.

Board of Highway Supervisors.

Require all wires to be put under ground, and compel the removal of those now strung overhead.

Grant no underground privileges without an equivalent in money or in public lighting.

Bureau of Lighting.

The City to build and operate her own electric light plants at the earliest day possible, and to own, at once, the poles on which public arc lights are placed.

Remove all lamp-posts not now used because of the erection of electric lights.

Revise the location of public lamps now erected.

Locate lamps under general instead of by special legislation.

Make contracts for lighting for longer than one year.

Bureau of Street Cleaning.

Make contracts for street cleaning, etc., for a longer period than one year, and request the Legislature to pass the Act of Assembly now pending, giving authority to make such contracts.

Bureau of Surveys.

Reorganize the Bureau by dividing it into a Bureau of Engineering, a Bureau of Surveys and a Registry Bureau.

Build sewers, main or branch, and lay drain pipe, under general instead of under special ordinances, or designate main sewers to be built in the appropriation ordinance, so that work on such structures can be begun early in the Spring and completed before Winter sets in.

Bureau of Water.

Adopt ordinances to restrain the waste of water.

Require the use of meters, with a view to the reduction of water rents.

Secure the dam at Flat Rock or build one at Roxborough Station.

Make appropriations for more pumping engines, more reservoirs and for the laying of large mains.

Authorize the Department to prepare plans for a permanent supply of water, other than by pumpage from the rivers Delaware and Schuylkill within the territorial limits of the City of Philadelphia.

Very many of the foregoing suggestions, if they commend themselves to Councils, and to you, could be put into operation at once. The others are dependent upon future appropriations.

All of them are believed to be in the direction of improving the public service in the branches for which the Department of Public Works is responsible.

CONCLUSION.

The foregoing report is a fair abstract of the work of the Department during the year 1891; for the detailed statements, reference is made to the reports of the Chiefs of the several Bureaus, hereto attached.

It is hoped that the documents submitted will have more than a perfunctory examination. Their careful perusal will well repay anyone desiring familiarity with this branch of our City government.

In your inaugural address, four years ago, you expressed the "hope that by careful and judicious management, and by economy," satisfactory results would be secured in the management of the gas works, which had just been transferred to the City by the Board of Trustees.

You stated that the streets of Philadelphia were "in a disgraceful condition;" that they were "both unclean and badly paved," and that there was "no Department of the City government in which more determination and vigor" was required than in the Department of Highways.

You referred to the fact that the supply of water was ample, but that, by reason of limited storage capacity, "the condition of the water after a freshet" rendered it "almost unfit for use." You said that "to remedy this evil we must have subsiding basins," and that "the subject of filtration is one that should be discussed and carefully investigated."

WORK OF THE DEPARTMENT.—The management of the gas works, the care of the highways and the water supply are all a part of the many duties devolving upon the Department of Public Works, and it cannot be out of place to submit, at the conclusion of your administration, a summary of the work done and planned during the past four years.

By this the officers of the Department, from the Director to the lowest subordinate, are willing to be judged as to capacity, industry and integrity for, and in, the work to which they have given their best thoughts and most persistent labors.

By this the tax and rent-payers of Philadelphia will be able to determine if the many millions of money, received as earnings from the Bureaus of Gas and Water, and as taxes levied upon, and paid by them, and appropriated for public works, have been honestly collected, and whether the results are commensurate with the amounts expended; and by this the impartial critic will decide whether the promises of better gas, better streets and better water, made in your inaugural address, have been realized to the extent of the means placed at the disposal of the Department.

The comparisons here submitted are not made in a spirit of criticism, nor of fault-finding with the previous management of affairs, but only for the purpose of showing the results accomplished in pursuance of the plans outlined and directed by you.

BETTER GAS.—The daily manufacturing capacity of the gas works has been increased 7,000,000, and the holder capacity 3,000,000 cubic feet. The gas made, averages twenty candle-power, an increase of two candles.

135 miles of pipe, of all sizes, were laid, over 13.7 per cent. as much as were laid in the previous fifty-one years of the existence of the works.

The most serious difficulty in supplying satisfactory gas—manufacturing and holder capacity having been secured—has been partially met by laying more than 33 miles of pipe over 6 inches in diameter, against a total of 134¼ miles of such pipe laid previous to 1887.

The make of gas per pound of coal carbonized, has been increased from 4.54 to 4.77 feet, and the number of men employed has been reduced from 2,257 to 1546.

By the introduction of modern appliances and by economies in men and in the expenditure of materials, the cost of making and distributing the gas has been reduced from $1.17 to eighty-four cents per 1000 feet.

In 1886 it cost	$3,499,388.89	to make and distribute	2,946,407,000 cu. ft. of gas,
and			
In 1890 it cost	2,806,551.42	to make and distribute	3,311,588,000 cu. ft. of gas.
A decrease in cost of	$692,837.47	and an increase in output of	365,181,000 cu. ft. of gas.

The gas works, as a whole, have been kept in the best state of repair, and all the improvements made have been of the most substantial character.

The total receipts for 1888, 1889 and 1890 were		$11,193,252.82
Current expenditures	$8,161,866.19	
For extensions,	817,667.48	
Total expenditures,		8,979,533.67
Cash profits for three years,		$2,213,719.15

To this must be added $2,413,528.13, the value of the gas furnished free to the several City Departments.

The receipts were less per 1000 cubic feet of gas, because the price had been reduced from $1.60 to $1.50.

The results obtained "by careful and judicious management and by economy" are certainly satisfactory.

BETTER AND CLEANER STREETS.—The streets of Philadelphia were truly "in a disgraceful condition"—badly paved, and therefore dirty. They are to-day cleaner than those in any other city in this country.

In 1888, the Bureau of Street Cleaning was organized, and the work of cleaning streets and inlets and of removing ashes, garbage and dead animals, was transferred from the Bureau of Highways to the new Bureau.

The need of "determination and vigor," to which you referred, was met by the new officers, and their zeal and energy have given us satisfactory returns for the large sums of money expended annually for this important and difficult branch of the public service.

The disgrace of dirty streets is being rapidly removed, and Philadelphia can confidently look forward to an early return of the days when she was the cleanest City in the world.

An equally satisfactory report in the matter of paving cannot yet be made; the streets are still "badly paved," but not to the extent that they were four years ago.

There are in our City 725 miles of paved streets, of which over 126 miles were paved or repaved with belgian block, sheet asphalt, vitrified brick or other material not cobble or rubble stone, during the past four years. Ten miles of this work was done in 1887, and nearly 45 miles in 1890.

Unfortunately, all the principal streets in that part of our City used for business purposes are occupied by passenger railway tracks. The contest, as to the liability of the companies owning these tracks, for replacing the cobble-stones with paving material more in accord with the demands of modern civilization is still in the Courts undecided.

The disgrace of badly-paved streets is an ever-present one, but it has been greatly reduced in extent by the repaving done under the appropriations made for this purpose. The work has been well done, but not until the legal questions surrounding this subject are finally determined will it be possible to give the people of our City well-paved streets.

No new paving is done with either cobble or rubble stone, and the limit of paving of this character is positively defined by the extent of the streets paved in former years.

The question of well-paved streets is hence one of appropriation of funds for repaving, and that is a question for Councils and not for the officers of this Department.

STREETS REPAVED WITH IMPROVED PAVEMENT.—As an evidence of the work done during the past four years, the following list of streets repaved with improved pavement is inserted:

† Front street, from Laurel street to Dickinson street.

Second street, from Callowhill street to South street.

† Third street, from Arch street to Spruce street.

Fourth street, from Vine street to Chestnut street.

* Crown street and York avenue, from Callowhill street to Buttonwood street.

Fifth street, from Race street to Chestnut street.

Sixth street, from Race street to Chestnut street.

* Marshall street, from Vine street to Girard avenue.

Seventh street, from South street to Columbia avenue. (From Spruce street to Columbia avenue this street was repaved by the Passenger Railway Company occupying it.)

Eighth street, from Callowhill street to Locust street.

Ninth street, from Spruce street to Spring Garden street. (This street was repaved by the Passenger Railway Company occupying it.)

Tenth street, from Race street to Walnut street.

Eleventh street, from Arch street to Walnut street.

Twelfth street, from Race street to Walnut street.

Thirteenth street, from Arch street to Locust street.

Fifteenth street, from Market street to Locust street.

Sixteenth street, from Market street to Locust street.

Seventeenth street, from Arch street to Locust street.

Nineteenth street, from Market street to Locust street.

* Twenty-first street, from Arch street to Fitzwater street.

Twenty-fifth street, from Biddle street to Green street.

* Thirty-ninth street, *Filbert street, *Saunders avenue, Lancaster avenue, again *Thirty-ninth street, *Parrish street and Fortieth street, making a continuous pavement from Woodland avenue to Elm avenue (the whole length of the street).

† Broad street, from Passyunk avenue to Germantown avenue (a distance of $5\frac{3}{4}$ miles).

* Tasker street, from Front street to Fifth street.

* Federal street, from Seventh street to Twenty-eighth street (the full length of the street not occupied by passenger railway tracks.)

Washington avenue, from Swanson street to Sixth street.

Carpenter street, from Seventh street to Sixteenth street.

* Queen street, from Second street to Sixth street.

Catharine street, from Eighth street to Broad street.

* Fitzwater street from Broad street to Grays Ferry avenue.

Bainbridge street, from Delaware avenue to Fifth street.

South street, from Delaware avenue to Fourth street, and from Broad street to Eighteenth street.

Spruce street, from Delaware avenue to Seventh street.

† Dock street, from Delaware avenue to Third street (the whole length of the street).

Walnut street, from Delaware avenue to Fifth street.

Sansom street, from Sixth street to Twelfth street.

†Chestnut street, from Delaware avenue to Eighteenth street.

†Market street, from Delaware avenue to Thirty-third street.

Filbert street, from Seventh street to Eleventh street.

Arch street, from Delaware avenue to Broad street.

† Cherry street, from Third street to Twenty-fourth street (the whole length of the street).

Race street, from Delaware avenue to Fifth street.

Callowhill street, from Delaware avenue to Fourth street.

* Noble street, from Delaware avenue to Marshall street.

* Hamilton street, from Thirty-first street to Lancaster avenue (the whole length of the street).

* Buttonwood street, from Second street to Seventeenth street.

† Spring Garden street, from Broad street to Thirty-third street.

* Mount Vernon street, from Tenth street to Twenty-third street (the whole length of the street).

* Parrish street, from Nineteenth street to Twenty-fourth street.

* Poplar street, from Delaware avenue to Seventh street.

† Girard avenue, from Morton street, near Gunner's Run, to Broad street, and from Thirty-first street to Lancaster avenue.

* Oxford street, from Seventh street to Twenty-eighth street.

* Hanover street, from Beach street to Frankford avenue.

* East Susquehanna avenue, from Cedar street to Coral street.

* Coral street, from East Susquehanna avenue to Diamond street.

* Diamond street, from Front street to Thirty-fourth street (the whole length of the street).

* East Susquehanna avenue, from Beach street to Girard avenue.

* Somerset street, from Philadelphia and Trenton Railroad to Frankford avenue.

The streets marked thus * are not occupied by passenger railway tracks.

On streets marked thus † some paving with improved pavement was done previous to 1887.

The list of streets newly paved is too long to be printed here.

The highway work of the past four years, other than paving or repaving, has been marvellous in extent and amount.

OTHER WORK ON STREETS.—

1,192,427.39 cubic yards of grading represent the extent of newly opened streets;
161,038.84 square " " footways were paved or repaved;
2,006,544.71 " " " paved streets were repaired; and
60,834.82 cubic " " broken stone were used in the repair of macadamized roads;
675,672.00 lineal feet of curb stone was reset;
142,951.78 " " " crossing stone,
101,592.00 " " " gutter stone and
13,768,56 " " " tramway stone were laid.

THE RECEIPTS OF THE BUREAU OF HIGHWAYS, principally from horse car licenses and from permits to open streets for house connections, etc., amounted to $256,735.60.

In 1890 they were	$71,514.32	
In 1886	58,390.01	
An increase of	$13,124.31,	nearly 23%.

The amount expended for repaving passenger railway streets ($481,336.82) will be repaid by the companies occupying these streets, if the decision of the lower Court as to their liability for this work is sustained by the Supreme Court.

The expenditures for all salaries and work other than extensions, were	$1,387,051.56
For extensions (new work)	2,671,003.40
Total	$4,058,054.96

This sum was altogether insufficient for the work that should, and still more for the work that could, have been done, and the most active efforts of the officers of the Bureau of Highways will fail in the attempt to remove the disgrace of badly-paved streets if the moneys appropriated for repaving are insufficient for the work.

BETTER WATER.—The supply of water has been increased by the completion of the Gaskill (Holly) pump, 20,000,000 gallons, and by the transfer of the Worthington pump from the Kensington Station to the Spring Garden Station, 6,000,000 gallons; total, 26,000,000 gallons in twenty-four hours.

The water in the river Delaware was so much contaminated by the discharge from Gunner's run that no pumping was done at the Kensington Station except in cases of emergency. The abandoning of the station has, therefore, removed this menace to public health, and the transfer of the pumping machinery to the Spring Garden Station has practically increased the capacity of the works to the extent named.

The total pumping capacity four years ago was	166,290,000	gallons in 24 hours
Less the capacity of the Kensington Pumping Station	6,000,000	"
	160,290,000	"
It is now	186,290,000	"
An increase of	26,000,000	"

By September next this will be increased 20,000,000 gallons per day by the completion of a new pump, for which a contract has been made with the Southwark Foundry and Machine Company.

The important matter of "SUBSIDING BASINS," or RESERVOIRS, has had careful attention. Four years ago the total storage capacity was	195,414,200	gallons,
or within	24,813,623	"
of the consumption of September 14, 1890, and within	43,774,451	"
of the average daily consumption of that year.		
The storage capacity now is	869,288,814	gallons,
An increase of	673,874,614	"
or more than 350 per cent.		

Instead of having less than thirty hours' supply of water, we now have nearly six days' supply.

The new reservoir at Roxborough, in process of construction, will, before 1892, add to this 148,000,000 gallons, within 47,000,000 gallons of the total reservoir capacity in 1887.

The cost of lifting 1,000,000 gallons 100 feet high has been reduced from $4.13 to $3.05, more than 25 per cent.

In 1887 it cost
$731,501.50 to pump 32,426,779,765 gallons of water and to lay 23 miles of pipe, whilst in 1890 it cost
712,497.37 to pump 51,698,508,699 gallons of water and to lay 30 miles of pipe, an increase in pumpage of 60 per cent., and of pipe laying of 33 per cent., with a decrease in expenditures of $19,004.13.

The receipts in 1890 were	$2,381,037 70
and in 1886	1,933,328 34
An increase of	$447,709 36

The annual requests for care in the use of water, to prevent a possible water famine, are things of the past, notwithstanding the increase in the average daily consumption per capita, from 80 gallons in 1886 to 131 gallons in 1890.

The improvement of the water by filtration, as suggested by you, has been discussed and investigated, but no appropriation for the installation of a filtering plant has as yet been made by Councils.

The total receipts from the Bureau of Water during 1887, 1888, 1889 and 1890, were		$8,768,398 66
Current expenditures	$2,855,622 79	
For extensions	1,673,096 59	
Total		4,528,719 38
Net profits in four years		$4,239,679 28

The question of the City's water supply has certainly had the attention which its importance demands, and the work done has been of great pecuniary profit to the City, and has added immensely to the quantity, and improved greatly the quality of the water supplied to the people of Philadelphia.

The lighting of the City's streets, and the construction of sewers and bridges, were not specially named by you, but the importance and extent of the work of the Bureaus of Lighting

and of Surveys, during the past four years, justify special reference to these matters in this place.

BETTER LIGHTING.—The Bureau of Lighting has under its care 27,791 public lamps as follows:

Gas lamps	19,338
Gasoline lamps	7,160
Electric arc lights	1,293
In addition to these the Board of City Trusts has electric arc lights	50
And the Bureau of Charities has gas lamps	172
A total of	28,013 public lamps.

In 1886 there were:

Gas lamps	15,919
Gasoline lamps	4,652
Electric arc lights,	354
Total,	20,925
An increase of	7,088 public lamps.

The question of the erection, by the City, of electric lighting plants, has been considered, but for want of funds, no active steps in that direction have been taken.

BETTER DRAINAGE.—The work of building sewers has assumed proportions scarcely hoped for a few years since. The many and pressing demands for main sewers had generally been postponed because there was no money for work of this character, but during the past four years 15.84 miles of main sewers were built.

This included the sewer on Norris street, to relieve the over taxed Cohocksink sewer; the Twenty-fifth street sewer, from Parrish streets to Pennsylvania avenue, to relieve the sewer on Parrish, Twenty-seventh, and Brown streets; the Somerset street sewer, as an outlet for the Hart Creek sewer, and work on the Mill Creek sewer, completing it from Woodland avenue and Forty-fifth street, to Forty-seventh and Brown streets.

Important extensions were built to the sewer on Gunner's Run, on Tasker street, on Snyder avenue, on Reed street, on Bainbridge street, on Twenty-fourth street, on Clearfield street on Wingohocking creek, and on many others.

The most important of all these works is undoubtedly the completion of the intercepting sewer, and the yearly extensions of its connections. This sewer not only covers from sight and smell the drainage of a large portion of our City, but it also discharges it into the river below the point from which the City's water supply is taken.

Some approximate idea of the work on main sewers can be formed from the statement that previous to the year 1887 only..... 56.34 miles of main sewers had been built, but that during the years 1887, 1888, 1889 and 1890..... 15.84 miles were constructed.

Their importance to the health of the City can only be appreciated by those who were compelled to live, or to transact business, within reach of the foul and unwholesome exhalations of the filthy streams which formerly discharged their noxious vapors into the open air.

Under the term "branch sewers" are included all drains of less than four feet in diameter. With these are made house and street connections, and they discharge into the main sewers which carry the sewage to the rivers.

The total length of branch sewers built previous to 1888 was .....222.02 miles, and there was built since that date.....107.48 miles.

More Bridges.—Twenty-eight bridges of all kinds were finished, or are now in process of construction. The most important of these are the bridges over the Schuylkill River at Market street and at Walnut street; the latter will be finished in 1892.

The smaller bridges were built chiefly over the tracks of the Pennsylvania and Reading Railroad Companies, to remove grade crossings. This work is of much importance and should be pushed even more rapidly than it has been during the past four years.

The reorganization of the survey districts, by which the Surveyors became salaried officials, paying all fees received to the City, is nearly completed. This change has transformed a branch of the public service, formerly a source of expense, into a source of profit to the City Treasury.

RECEIPTS AND EXPENDITURES.—The appropriations, expenditures and receipts of the Department for the year 1890, are set out in the following table in detail by Bureaus, and also in totals for the years 1887, 1888 and 1889.

The current expenses for the past four years, which include all and every outgo, except for new work amounted to	$19,548,065.16
Whilst the actual cash receipts, principally for gas and water, were	24,305,548.12
These figures show that, except for new work, the Department of Public Works has paid its own way, and has turned into the City Treasury a cash balance of	4,757,482.96

This may appear strange to those who have always thought that this was a money-spending rather than a money-earning branch of the City government, but the figures show beyond question that the profits from the City's gas and water works are sufficient to keep in repair, to clean and to light the public highways and bridges; to keep in repair and clean the drains and sewers, and to pay the salaries and wages of the two thousand five hundred men on the pay-rolls of the Department of Public Works.

The excess of receipts over expenditures amounting to	$4,757,482.96
and	3,021,591.80
additional, received from loans and through taxation, has been appropriated and spent for new work.	
There is available for such work under contract but not completed in 1890	1,225,763.12
These figures prove that the maintenance of the public works of Philadelphia, during the years 1887, 1888, 1889 and 1890, and the improvements, additions and extensions made during the same time in the gas works, on the highways, in the lighting, in the building of bridges and sewers, and in the water works, costing	$7,779,074.76
have cost the people of Philadelphia, as taxpayers, just	$3,021,591.80

Startling, but true!

The following summary of the totals of the foregoing larger table is inserted to show the correctness of the above conclusions :

	Receipts.	Current Expenses.	Surplus.
1887	$5,937,376 23	$5,308,664 10	$628,712 13
1888	6 109 016 05	5,000,632 68	1,108,383 37
1889	6,046,621 03	4,633,413 95	1,413,207 08
1890	6,212,534 81	4,605,354 43	1.607,180 38
	$24,305,548 12	$19,548,065 16	$4,757,482 96

The expenditures for "Extensions," or new work, were as follows:

	Expenditures.	Surplus from Receipts.	Amount from Taxes.
1887	$1,273,774 00	$628,712 13	$645,061 87
1888	1,741,094 54	1,108,383 37	632,711 17
1889	2,148,517 70	1,413,207 08	735,310 62
1890	2,615,688 52	1,607,180 38	1,008.508 14
	$7,779,074 76	$4,757,482 96	$3,021,591 80

RESULTS ACCOMPLISHED AND NECESSARY APPROPRIATIONS.—The results accomplished have been large, greatly in excess of what could have been possible a few years since, but the improvements made have not been equal to the demands. The uninformed, or the unreasonable citizen, cannot, or will not, understand why he is not supplied with everything that he desires in the way of public improvements whenever he makes his wishes known to the Department, and he quickly becomes satisfied that its management of the City's work is a failure.

He overlooks the fact that it is impossible to do even public work without funds, and that the power to take his money, and that of the other tax-payers, for such work is vested solely in City Councils.

After the money has been secured by the annual tax levy, its expenditure is still subject to appropriation by Councils, and the Department can only do the work as authorized and directed through the ordinances they pass.

The officers of the Department of Public Works realize more fully than anyone else can possibly do, the insufficiency of their work to meet the needs of the public, but they claim, most positively and emphatically, that the City and the citizens have, during the past four years, received more and better work for the amount of money expended than ever before.

All the money supplied has been spent honestly, intelligently and promptly, upon the work for which it was appropriated, and very much more could and would have been expended if it had been given us.

LAW SUITS.—The extensive operations of the Department sometimes brought it into conflict with private citizens, and still more frequently with dissatisfied or delinquent contractors. Unable to convince the officers of the Department of the justice of their causes, the delinquents resorted to the Courts for redress, or were summoned there by the City.

The suits brought were sometime against the officers personally, the suitors claiming from the Director, as a private individual, in one case $20,000.00 and in another $50,000.00.

It is needless to say that they never would have been able to collect these sums, even had they secured verdicts for them, but it is a satisfaction to report that all the suits brought by the Department and tried, and those brought against the Department, or its officers, have been decided in favor of the City or the officers, either in the lower courts or on appeal to the Supreme Court. It is possible that we were not always right, but the Law Department persuaded the Courts and juries that we were.

APPROPRIATIONS FOR 1891.—A copy of the ordinance making appropriations to this Department for the year 1891, is attached to this report. The following is an abstract of that ordinance, with a statement of balances available from previous years for work ordered, and for which contracts are executed.

Bureau.	Annual appropriation for the year 1891.	Balance available from previous years.	Total.
Director's Office	$15,520 00		$15,520 00
City Ice Boats	37,400 00		37,400 00
Bureau of Gas	2,694,368 00	$7,550 59	2,701,918 59
Bureau of Highways	903,424 00	151,353 04	1,054,777 04
Bureau of Lighting	580,100 00		580,100 00
Bureau of Street Cleaning	563,920 00		563,920 00
Bureau of Surveys	1,015,345 00	714,406 52	1,729,751 52
Bureau of Water	1,261,603 00	352,080 48	1,613,683 48
Total	$7,071,680 00	$1,225,390 63	$8,297,070 63

Having reached the last of the last report which it shall be my duty and privilege, as Director of the Department of Public Works, to make to you, as Mayor of the City of Philadelphia, words fail me to express my feelings, even if such expressions could find a proper place in an official report.

When, four years ago, you selected me for the position I now hold, I entered upon its new and untried duties with the determination to do no discredit to you and to bring no dishonor upon myself.

If my conduct, official and personal, has your approval, I am content, satisfied that your judgment will finally be approved by all fair-minded people.

I brought to the service of the City all my powers of body and mind, so that I might, to some degree, help to make your administration, the first under the amended City Charter, a successful one.

The four years have been altogether too short for the work of reorganizing the independent and conflicting Departments which, since 1854, had filled the place assigned to the new Department of Public Works, and to meet, to some limited extent, the impatient desires of the people for better things; but if, as the poet says,

"We live in deeds, not years; in thoughts, not breaths;
In feelings not in figures on a dial,"

if

"We should count time by heart throbs"

then I have had an experience, short in duration as time goes, but covering years of honest desires, laudable ambitions and continued labor.

Honest desires to deal fairly with all, laudable ambitions to improve the physical condition of Philadelphia, and continued labor to perform, not all that was expected of me, but only all that it was possible for me to do.

Criticisms of my plans and of their execution have been as plentiful as they were frequently unreasonable and not well founded, but none, I believe, have ever been made of my honest intentions.

With neither the time nor the inclination to discuss my work with everybody who fancied that he understood it better than I did, or to explain my plans except to those entitled to such explanations, I worked on, satisfied that those who knew best what was being done would most approve the results.

I feel that you and the City Councils find no serious fault with what has been done, and I am persuaded that when the citizens generally realize the extent of the operations of the past four years, when they understand, in some detail, what has been accomplished, and, still more, what was not done, in spite of the ever present pressure and inducements to do, they will confirm such approval.

Not claiming infallibility in either judgment or execution, and realizing, better even than my critics can do, my deficiencies and shortcomings, I nevertheless demand that I shall be judged by my work, and that it shall be judged by the rules generally applied to such work, and by men competent, by knowledge and experience, to pass such judgment.

To my assistants and subordinates, Chiefs of Bureaus and others, I tender my acknowledgments for the support they have given me in my efforts to secure for the City satisfactory and

honest service. Without such support, comparatively little of what has been done could have been accomplished.

To you, sir, are due my heartfelt thanks for your continued kindness, your unwearied aid, your ready counsel during all these years of labor and of contentions.

Without the knowledge that you were always ready to advise in time of difficulty, to instruct in plans and in their execution, to praise honest effort and to commend and approve results, the onerous, and often unpleasant, duties of my place would have been more difficult of discharge.

I wish you, in anticipation of your retirement from the office of Mayor to private life, many years of continued health and happiness.

Very truly yours,

Director.

APPENDIX.

AN ORDINANCE

To make an appropriation to the Department of Public Works, for the year 1891.

SECTION 1. *The Select and Common Councils of the City of Philadelphia do ordain*, That the sum of seven million seventy-one thousand six hundred and eighty (7,071,680) dollars be, and the same is hereby appropriated to the Department of Public Works for the year 1891, as follows:

Director's Office.

Of the amount appropriated to this Department, the sum of fifteen thousand five hundred and twenty (15,520) dollars is for expenses of office, as follows:

Item 1. For salaries: Director of Department of Public Works, seven thousand five hundred (7500) dollars; chief clerk, two thousand (2000) dollars; clerk, one thousand (1000) dollars; stenographer and clerk, nine hundred (900) dollars; stenographer and type writer, nine hundred (900) dollars; messenger, seven hundred and twenty (720) dollars; total, thirteen thousand and twenty (13,020) dollars.

Item 2. For keep of horse and carriage hire, five hundred (500) dollars.

Item 3. For printing, stationery and incidentals, two thousand (2000) dollars.

City Ice Boats.

SECT. 2. Of the amount appropriated to this Department, the sum of thirty-seven thousand four hundred (37,400) dollars is for the expenses of the City Ice Boats, as follows:

Item 1. For repairs and equipment of boats and machinery, ten thousand (10,000) dollars.

Item 2. For fuel, ten thousand (10,000) dollars.

Item 3. For salary of superintendent, one thousand six hundred and fifty (1650) dollars; clerk, four hundred (400) dollars; engineer, one thousand and eighty (1080) dollars; and wages, nine thousand five hundred and seventy (9570) dollars; total, twelve thousand seven hundred (12,700) dollars:

Item 4. For provisions, two thousand five hundred (2500) dollars.

Item 5. For insurance, one thousand two hundred (1200) dollars.

Item 6. For stationery, advertising, incidentals and office rent, one thousand (1000) dollars: *Provided*, that warrants may be countersigned on Items 1, 2, 3 and 4, for bills of 1890.

Bureau of Gas.

SECT. 3. Of the amount appropriated to this Department, the sum of two million six hundred and ninety-four thousand three hundred and sixty-eight (2,694,368) dollars is for the expenses of the Bureau of Gas, as follows:

Item 1. For salary of chief of bureau, five thousand five hundred (5500) dollars; assistant to the chief and general storekeeper, three thousand (3000) dollars; general superintendent of distribution and general bookkeeper and controller, each two thousand five hundred (2500) dollars, five thousand (5000) dollars; chief clerk (main office), paymaster and chief clerk at works, and superintendent of stables, coke and hauling, each two thousand (2000) dollars, six thousand (6000) dollars; registrar and chief meter inspector and three superintendents of works, each one thousand eight hundred (1800) dollars, seven thousand two hundred (7200) dollars; general clerk (main office), one superintendent of works and registrar, miscellaneous clerk, architect and draughtsman and general foreman of distribution, each one thousand five hundred (1500) dollars, seven thousand five hundred (7500) dollars;

chief transfer clerk, one thousand three hundred and twenty (1320) dollars; time and meter clerk, two superintendents (Spring Garden and Germantown offices) and electrician, each one thousand two hundred (1200) dollars, four thousand eight hundred (4800) dollars; chief weigher and coal clerk, one thousand one hundred and forty (1140) dollars; assistant transfer clerk, suspense clerk, two inspectors of fittings, application clerk, assistant to chief meter inspector (Spring Garden office), superintendent of shops and clerk and time-keeper (Twenty-fifth Ward works), each one thousand and eighty (1080) dollars, eight thousand six hundred and forty (8640) dollars; assistant to chief meter inspector (main office), foreman of meter and repair shops and foreman coke yard (Ninth Ward Works), each one thousand (1000) dollars, three thousand (3000) dollars; six assistant foremen of distribution and superintendent (Frankford office), each nine hundred and sixty (960) dollars, six thousand seven hundred and twenty (6720) dollars; three bill clerks, removal clerk, two foremen coke yards (Twenty-fifth and Twenty-six Ward works), carpenter and messenger, two detectives and clerk of shops, and clerk to general storekeeper, each nine hundred (900) dollars, nine thousand nine hundred (9900) dollars; four inspectors of fittings and one fireman, each eight hundred and forty (840) dollars, four thousand two hundred (4200) dollars; sixty meter inspectors, superintendent holder-station and six meter provers, each seven hundred and eighty (780) dollars, fifty-two thousand two hundred and sixty (52,260) dollars; forty-five out-ordermen and superintendent of holder-station, each seven hundred and twenty (720) dollars, thirty-three thousand one hundred and twenty (33,120) dollars; two chemists, each five hundred (500) dollars, one thousand (1000) dollars; six telegraph operators, each three hundred and sixty (360) dollars, two thousand one hundred and sixty (2160) dollars; for cleaning main office, five hundred (500) dollars, and two Sunday watchmen (main office) each one hundred and four (104) dollars, two hundred and eight

(208) dollars; in all one hundred and sixty-three thousand one hundred and sixty-eight (163,168) dollars.

Item 2. For wages of stokers and helpers, mechanics, laborers and other employés engaged in the manufacture of gas, laying of service pipe, maintenance of buildings and the collection and delivery of coke, seven hundred thousand (700,000) dollars.

Item 3. For cannel and gas coal, eight hundred thousand (800,000) dollars.

Item 4. For material, supplies, repairs and improvements at works, two hundred and eighty-five thousand (285,000) dollars.

Item 5. For printing, advertising, stationery and other incidentals, thirteen thousand (13,000) dollars.

Item 6. For gas manufactured by the Philadelphia Gas Improvement Company, and delivered into the holders of the City at the Twenty-fifth Ward Gas Works, in accordance with contract dated August 3, 1888, at the rate of thirty-seven (37) cents per one thousand (1000) cubic feet, four hundred thousand (400,000) dollars.

Item 7. For the purchase and laying (including material and labor accounts) of pipes for the distribution of gas, one hundred and twenty-five thousand (125,000) dollars.

Item 7½. For refunding to parties money expended in laying gas-pipe, eight thousand two hundred (8200) dollars: *Provided*, That the amount paid under this item shall in no case exceed the amount paid by the City of Philadelphia for service pipe and laying the same.

Item 8. For extensions, two hundred thousand (200,000) dollars: *Provided*, That the items for extensions, known as Items 8 and 8½ in the annual appropriation for 1890 shall not merge: *And provided*, That the City Controller shall approve such bills for work, labor or material done, made or furnished prior to 1891, as shall have been approved by the Director of the Department of Public Works, the aggregate amount thereof not exceeding sixty thousand (60,000) dollars.

Bureau of Highways.

SECTION 4. Of amount appropriated to this Department, the sum of nine hundred and three thousand four hundred and twenty-four (903,424) dollars is for the expenses of the Bureau of Highways, as follows:

Item 1. For salaries: Chief of bureau, three thousand five hundred (3500) dollars; five assistants and one superintendent of bridges, each one thousand eight hundred (1800) dollars; chief clerk, two thousand (2000) dollars; chief clerk's assistant, contract clerk, bill clerk, and assistant clerk and stenographer, each one thousand (1000) dollars; license clerk, eleven hundred and seventy (1170) dollars; reference and complaint clerk, eight hundred (800) dollars; ten inspectors, nine hundred (900) dollars each; inspector of repairs to sewers, twelve hundred (1200) dollars; office boy and messenger, five hundred (500) dollars; two yard watchmen, each six hundred (600) dollars; total, thirty-four thousand one hundred and seventy, 34,170) dollars.

Item 2. For paving intersections of streets and unassessable property, one hundred and fifty thousand (150,000) dollars.

Item 3. For repairs to paved streets, to include repaving around lamp posts, fire-plugs and breaks for other municipal purposes in footways, one hundred thousand (100,000) dollars.

Item 4. For repairing and maintaining unpaved streets, macadamized streets, roads, trunks, drains and bridges not exceeding eight feet span, and constructing new trunks and drains, purchasing material for and resurfacing macadamized roads, and putting cinders and gravel on country roads, forty-five thousand (45,000) dollars.

Item 4½. For surfacing Sixtieth street, from end of present surfacing south of Market street southward, in the Twenty-seventh Ward, eight thousand (8000) dollars.

Item 5. For repairing, altering and extending sewers and inlets, and trapping and retrapping inlets and cleaning sewers, twenty thousand (20,000) dollars.

Item 6. For grading streets and roads, one hundred thousand (100,000) dollars.

Item 7. For general repairs to bridges, twenty-five thousand (25,000) dollars.

Item 8. For clerk hire and incidentals, five hundred (500) dollars, and for other expenses of the Board of Highway Supervisors, three thousand (3000) dollars; total, three thousand five hundred (3500) dollars.

Item 9. For printing, advertising and stationery, five thousand (5000) dollars.

Item 10. For insurance on bridges, three hundred and seventy (370) dollars.

Item 11. For incidentals and office and yard expenses, three thousand seven hundred (3700) dollars.

Item 12. For repairing meadow banks, to include repairs to the banks of Hollanders Creek, in the First and Twenty-sixth Wards, one thousand (1000) dollars.

Item 13. For salaries of two watchmen on Market Street Bridge, four on Callowhill Street Bridge, and two on Girard Avenue Bridge, at six hundred and forty-eight (648) dollars each, and forty (40) dollars each for uniforms; four watchmen on Penrose Ferry Bridge, six on South Street Bridge, at six hundred and forty eight (648) dollars each; two on Bridesburg Bridge, two on Falls Bridge and two on Gray's Ferry Bridge, at six hundred (600) dollars each; one on Orthodox Street Bridge over Frankford Creek, at four hundred and fifty (450) dollars, and two engineers on Penrose Ferry Bridge, at nine hundred (900) dollars each; total, seventeen thousand eight hundred and thirty-four (17,834) dollars.

Item 14. For grading, paving and repaving footways, curbing and resetting curbs, two thousand (2000) dollars.

Item 15. For crossing gutter and tramway stones: *Provided*, That in repairing tramway streets, where, from one intersection to the next a majority of the tramway stones are broken or worn out, the Director of the Department of Public Works may substitute from curb to curb of said streets granite block pave-

ment with pitch cemented joints: *And provided*, That in repairing gutters where the present gutterstones from one intersection to the next are unfitted for the purpose, the Director of the Department of Public Works may pave said gutters with granite blocks and pitch cemented joints, and payment for the above-mentioned labor and material shall be made from this item, forty thousand (40,000) dollars.

Item 16. For carriage hire and keep of horses for the chief of the Bureau of Highways, the assistants, superintendent of bridges, inspector of repairs to sewers, and one inspector each in the second, third, fourth and fifth districts, four hundred (400) dollars each; total, four thousand eight hundred (4800) dollars.

Item 17. For sprinkling the macadamized portions of South Broad street, two hundred and fifty (250) dollars.

Item 18. For oil, coal and engineers' stores for bridges, one thousand two hundred (1200) dollars.

Item 19. For grade, curb and gutter stakes for paving and preliminary estimates, one hundred (100) dollars.

Item 20. For emergencies, seven thousand (7000) dollars.

Item 21. For stone and iron cross gutters, two thousand (2000) dollars.

Item 22. For inspectors of new work, at the rate of seventy-five (75) dollars per month while actually employed, ten thousand (10,000) dollars.

Item 23. For repaving with improved pavement streets not occupied by passenger railways: *Provided*, That the streets shall be first designated by ordinance of Councils, three hundred thousand (300,000) dollars.

Item 24. For opening waterways and repairing meadow banks in the Twenty-seventh ward, seven thousand five hundred (7500) dollars.

Item 25. For repaving with Belgian blocks Washington avenue, from Sixth to Twelfth street, from curb to track on

east side: *Provided*, Said sum shall complete the work: *And, provided also*, That this item shall not merge December 31, 1891, fifteen thousand (15,000) dollars: *Provided*, That any balance remaining to the credit of Items 2 and 6 of the appropriation for the year 1890 shall not merge; *And, provided*, That in repaving streets payment for which is to be taken from Items 15 or 23, the Director of the Department of Public Works is hereby authorized to construct sewers, lay or relay gas or water-pipes in any of the said streets, wherever the same may be necessary, said sewers to be built in accordance with the ordinance of May 12, 1886, and February 16, 1869, regulating the construction of sewers, any excess over and above the assessments provided for in ordinance of April 3, 1868, to be charged to Item 21, Section 7, of the ordinance making an appropriation to the Department of Public Works for the year 1891, and the cost of laying and relaying gas-pipes shall be charged to Item 7, Section 3, and of the laying and relaying water-pipes, to Item 8, Section 8, of the same ordinance, and that he may cause any specified work chargeable to Item 12, Repairs of Meadow Banks, and Item 20, Emergencies, to be done by day's labor; and that the City Controller shall approve bills for work, labor or material done, made or furnished prior to 1891, the aggregate amount thereof not to exceed ten thousand (10,000) dollars, the same to be taken from the several items to which they are properly chargeable.

Bureau of Lighting.

SECT. 5. Of the amount appropriated to this Department the sum of five hundred and eighty thousand one hundred (580,100) dollars is for the expenses of the Bureau of Lighting, as follows:

Item 1. For salaries: Chief of bureau, eighteen hundred (1800) dollars; clerk, one thousand (1000) dollars; five district superintendents, nine hundred (900) dollars each, four

thousand five hundred (4500) dollars; total, seven thousand three hundred (7300) dollars.

Item 2. For keep of horses and wagons for chief of bureau and five district superintendents, four hundred (400) dollars each; total, two thousand four hundred (2400) dollars.

Item 3. For wages of lamplighters, foreman, messenger, lamp repairers, driver and laborer, one hundred and thirty-four thousand (134,000) dollars.

Item 4. For matches, lamp glass, fittings and other material, four thousand five hundred (4500) dollars.

Item 5. For printing, advertising and other incidentals, six hundred (600) dollars.

Items 6. For electric lighting, two hundred and twenty-four thousand three hundred (224,300) dollars.

Item 7. For furnishing naphtha to and lighting all and every night extinguishing, cleansing and repairing, six thousand nine hundred and seventy (6970) lamps of the "Maloney Company Patent," now erected at twenty-one (21) dollars each, and two hundred and fifty (250) lamps for six months (to be changed to gas lamps), one hundred and forty-seven thousand nine hundred and ninety-five (147,995) dollars; for furnishing naphtha to and lighting all and every night extinguishing, cleansing and repairing one thousand (1000) new lamps of the "Maloney Company Patent" to be erected during the year 1891, for eight (8) months, at fourteen (14) dollars each, fourteen thousand (14,000) dollars; for renewals and removals, two thousand and five (2005) dollars; total, one hundred and sixty-four thousand (164,000) dollars: *Provided*, That no gasoline lamps shall be located on any street where gas mains are laid.

Item 8. For lighting Northern Liberties district, eight thousand (8000) dollars.

Item 9. For extensions, including new gas lamps, twelve thousand (12,000) dollars; and for electric lights, twenty-three thousand (23,000) dollars; total, thirty-five thousand (35,000) dollars.

Bureau of Street Cleaning.

SECT. 6. Of the amount appropriated to this Department, the sum of five hundred and sixty-three thousand nine hundred and twenty (563,920) dollars is for the expenses of the Bureau of Street Cleaning, as follows:

Item 1. For salary of chief of Bureau, two thousand five hundred (2500) dollars; five inspectors, each one thousand (1000) dollars, five thousand (5000) dollars; one clerk, one thousand (1000) dollars; messenger, seven hundred and twenty (720) dollars; in all, nine thousand two hundred and twenty (9220) dollars.

Item 2. For keep of horses and wagons for chief of Bureau and five inspectors, four hundred (400) dollars each, two thousand four hundred (2400) dollars.

Item 3. For printing, stationery and incidentals, three hundred (300) dollars.

Item 4. For cleaning streets, inlets and public market houses, and for the removal of ashes, garbage and dead animals, five hundred and fifty-two thousand (552,000) dollars.

Bureau of Surveys.

SECT. 7. Of the amount appropriated to this Department, the sum of one million fifteen thousand three hundred and forty-five (1,015,345) dollars is for the expenses of the Bureru of Surveys, as follows:

Item 1. For salaries of the chief engineer and surveyor, four thousand (4000) dollars; principal assistant, two thousand two hundred and fifty (2250) dollars; assistant, one thousand eight hundred (1800) dollars; recording clerk, one thousand

six hundred and fifty (1650) dollars; draughtsman, one thousand five hundred (1500) dollars; sewer registrar, one thousand five hundred (1500) dollars; one draughtsman, one thousand four hundred (1400) dollars; two draughtsmen, one thousand (1000) dollars each, two thousand (2000) dollars; sewer clerk, one thousand (1000) dollars; stenographer and type-writer, eight hundred and fifty (850) dollars; rodman, seven hundred and twenty (720) dollars; janitor, six hundred (600) dollars; registrar, two thousand (2000) dollars; registry clerk, one thousand one hundred (1100) dollars; search clerk, one thousand (1000) dollars; four draughtsmen, one thousand (1000) dollars each, four thousand (4000) dollars; and three draughtsmen, nine hundred (900) dollars each, two thousand seven hundred (2700) dollars; in all, thirty thousand and seventy (30,070) dollars.

Item 2. For stationery, record books, draughting material and instruments, two thousand five hundred (2500) dollars.

Item 3. For cleaning offices, carriage hire, advertising and incidentals, one thousand five hundred (1500) dollars, and for making and recording observations of rain and stream gauges, three hundred (300) dollars; in all, one thousand eight hundred (1800) dollars.

Item 4. For salaries of three surveyors and regulators, one quarter, one hundred and twenty-five (125) dollars each, three hundred and seventy-five (375) dollars; for salaries of nine surveyors and regulators at three thousand (3000) dollars each, twenty-seven thousand (27,000) dollars; for salaries of four surveyors and regulators, from and after April 1, 1891, at two thousand two hundred and fifty (2250) dollars each, nine thousand (9000) dollars; and for wages of employees, expenses, rent, furniture, tools and instruments, carriage hire and horse keep and incidentals: in the First District, three thousand six hundred (3600) dollars; in the Second District, three thousand six hundred (3600) dollars; in the Third District, six thousand five hundred (6500) dollars; in the Fourth District, four thousand

three hundred (4300) dollars; in the Fifth District, six thousand (6000) dollars; in the Sixth District, four thousand one hundred (4100) dollars; in the Seventh District, five thousand five hundred (5500) dollars; in the Eighth District, six thousand five hundred (6500) dollars; in the Ninth District, six thousand (6000) dollars; in the Tenth District, six thousand eight hundred and fifty (6850) dollars; in the Eleventh District, five thousand two hundred (5200) dollars; in the Twelfth District, six thousand (6000) dollars; and in the Thirteenth District, seven thousand (7000) dollars; in all, one hundred and seven thousand five hundred and twenty-five (107,525) dollars: *Provided*, That the fees earned in each district shall amount to the salaries over and above the expenses of the office, and that work done for any department, bureau, board or commission of the City shall be taken to be fees earned within the meaning hereof.

Item 5. For preparing liens for municipal claims, four hundred (400) dollars.

Item 6. For corner stones and replacing landmarks, one thousand (1000) dollars.

Item 7. For examination of bridges and sewers, one thousand (1000) dollars.

Item 8. For new surveys and work ordered by Councils, not otherwise provided for, five hundred (500) dollars.

Item 9. For renewing plans and descriptions and rebinding plan books in the Registry Bureau, one thousand (1000) dollars.

Item 10. For rearranging indexes and descriptions in the Registry Bureau, one thousand five hundred (1500) dollars.

Item 11. For removing objectionable footway gutters, five hundred (500) dollars.

Item 12. For carriage hire and keep of horse for the chief engineer and assistant, eight hundred (800) dollars.

Item 13. For expenses attending the preparation of plans of the port, and for the increase of its landing accommodations, two thousand (2000) dollars.

Item 14. For establishing standard levels and measures in various parts of the city, testing work on plans, and inspecting surveys and plans, two hundred and fifty (250) dollars.

Item 15. For salaries of two inspectors of drain connections at twelve hundred (1200) dollars each, two thousand four hundred (2400) dollars: *Provided*, They do not engage in any other business during the business hours of the day.

Item 16. For salary of one supervisor of the intercepting sewer, nine hundred (900) dollars.

Item 17. For engraving and printing maps of the City, two hundred (200) dollars.

Item 18. For the examination and reconstruction of old sewers, with manholes, ventilators and ventilation connections, twenty-five thousand (25,000) dollars.

Item 19. For the construction of main sewers, four hundred and seventy-five thousand (475,000) dollars.

Item 20. For the Aramingo Canal system, seventy-five thousand (75,000) dollars.

Item 21. For the construction of branch sewers, inlets and manholes, one hundred and twenty-five thousand (125,000) dollars: *Provided*, That the amounts assessable for the construction of sewers in front of City properties shall be paid out of this item.

Item 22. For connections with the intercepting sewer, fifty thousand (50,000) dollars.

Item. 23. For new bridges, seventy-five thousand (75,000) dollars.

Item 24. For a bridge over Penn street on the line of the Philadelphia & Norristown Railroad, in the Twenty-eighth Ward, thirty-six thousand (36,000) dollars: *Provided*, That the bridge shall cost at least forty-five thousand (45,000) dollars, and in no event shall it cost the City more than the amount hereby appropriated; the bridge to be built under the direction of and according to plans prepared by the Depart-

ment of Public Works: *Provided*, That the City Controller shall approve bills for labor and material done or furnished prior to 1891, the aggregate amount thereof not to exceed two thousand (2000) dollars, the same to be taken from the appropriate item: *Provided*, That balances remaining to the credit of Items 26, 26½, 27, 28, 29, 30, 34 and 35 of the appropiation for the year 1890 shall not merge.

Bureau of Water.

SECT. 8. That of the amount appropriated to this Department, the sum of one million two hundred and sixty-one thousand six hundred and three (1,261,603) dollars is for the expenses of the Bureau of Water, as follows:

Item 1. For salary of chief of Bureau, six thousand (6000) dollars; chief clerk, two thousand (2000) dollars; assistant clerk, one thousand and eighty (1080) dollars; correspondence clerk, nine hundred (900) dollars; time clerk, nine hundred (900) dollars; messenger, six hundred and fifty (650) dollars; draughtsman, one thousand eight hundred (1800) dollars; draughtsman, one thousand (1000) dollars; draughtsman, nine hundred (900) dollars; draughtsman, eight hundred (800) dollars; general superintendent, three thousand five hundred (3500) dollars; clerk and paymaster, one thousand one hundred (1100) dollars; assistant clerk, eight hundred and fifty (850) dollars; assistant to chief, two thousand (2000) dollars; clerk, one thousand (1000) dollars; assistant clerk, nine hundred (900) dollars; pipe inspector, one thousand three hundred and fifty (1350) dollars; pipe clerk, eight hundred and fifty (850) dollars; assistant to chief, one thousand four hundred (1400) dollars; search clerk, one thousand one hundred (1100) dollars; assistant search clerk, nine hundred (900) dollars; assistant clerk, eight hundred and fifty (850) dollars; chief inspector, one thousand one hundred (1100) dollars; nineteen (19) inspectors, each, nine hundred (900) dollars; permit clerk, one thousand and

eighty (1080) dollars; assistant permit clerk, one thousand (1000) dollars; purveyor, fourth district, one thousand six hundred (1600) dollars; five (5) purveyors, 1st, 2d, 3d, 5th and 6th districts, each, one thousand four hundred and eighty (1480) dollars; six (6) purveyors' clerks, each, seven hundred and twenty (720) dollars; seven (7) general foremen, each nine hundred and thirty-nine (939) dollars; five (5) foremen of repairs, each, seven hundred and eighty (780) dollars; superintendent of shop, one thousand five hundred (1500) dollars; clerk to superintendent of shop, nine hundred (900) dollars; ten (10) engineers, each one thousand (1000) dollars; two (2) engineers (with houses), each, eight hundred and ten (810) dollars; one engineer, seven hundred and fifty (750) dollars; helper, seven hundred and fifty (750) dollars; two oilers, acting as assistant engineers, each, eight hundred and ten (810) dollars; twenty (20) oilers, each, eight hundred (800) dollars; thirty (30) firemen, each, seven hundred and fifty (750) dollars; six (6) firemen, for eight (8) months, each at the rate of seven hundred and fifty (750) dollars per year; sixteen (16) coal passers, each, six hundred and seventy-five (675) dollars; two (2) storekeepers, each, seven hundred (700) dollars; foreman of machinists, one thousand five hundred (1500) dollars; foremen, bricklayers and carpenters, each, one thousand (1000) dollars; foremen of stonemasons, painters, riggers, each nine hundred (900) dollars; foreman of laborers, eight hundred and forty (840) dollars; twenty-five watchmen, each, six hundred and seventy-five (675) dollars; four policemen, each, six hundred and seventy-five (675) dollars, with an additional sum of forty (40) dollars each for the purchase of uniforms; janitor at main office, six hundred and seventy-five (675) dollars; six (6) janitors, each, six hundred (600) dollars; river watchman, nine hundred (900) dollars; lineman, seven hundred and twenty (720) dollars; telephone operator (night), six hundred (600) dollars; two (2) telephone operators (day), each three hundred and sixty (360) dollars; electrician, one thousand and fifty (1050) dollars; general storekeeper, nine hundred

(900) dollars; total, one hundred and eighty-four thousand three hundred and three (184,303) dollars.

Item 2. For general supplies, including fuel, oil and small stores, one hundred and sixty thousand (160,000) dollars.

Item 3. For repairs to machinery, including the conveyance of workmen incident thereto, fifty thousand (50,000) dollars.

Item 4. For the maintenance and repairs to buildings, grounds and reservoirs, sixty thousand (60,000) dollars.

Item 5. For repairs and improvement of the distribution, including the purchase of materials and cost of labor in connection therewith, and expenses incident thereto, ninety thousand (90,000) dollars.

Item 6. For supplies, including fuel and labor, at the City construction and repair shops, seventy-five thousand (75,000) dollars.

Item 7. For general, incidental and contingent expenses, including keep of horses for chief of Bureau, general superintendent and assistant, each four hundred (400) dollars, fourteen thousand (14,000) dollars.

Item 8. For the purchase of material and cost of labor in connection with the laying of service pipe and expenses incident thereto, one hundred and twenty-five thousand (125,000) dollars.

Item 8½. For refunding to parties money expended in laying water-pipe, three thousand three hundred (3300) dollars: *Provided*, That the amount paid under this item shall in no case exceed the amount paid by the City of Philadelphia for service pipe and laying the same.

Item 9. For extensions, five hundred thousand (500,000) dollars: *Provided*, That nothing in this ordinance shall prevent the Director of the Department of Public Works from laying water-pipe, making repairs by day's work, or the employment of any additional service, when the exigencies require: *Provided also*, That the City Controller shall approve bills for

work, labor or material done, made or furnished prior to 1891 to Bureau of Water, the aggregate amount thereof not to exceed twenty-five thousand (25,000) dollars.

SECT. 9. When the Director of the Department of Public Works is obliged to employ labor to do work under neglected or annulled contracts, then payment shall be made from the item against which such contracts are charged, and the amount so paid charged against the contractor on the amount set aside for such neglected or annulled contracts.

SECT. 10. Warrants shall be drawn as follows:

For the employés of the City Ice Boats, one warrant, payable monthly.

For the Bureau of Gas: For the employés of the main office, meter and pipe inspector's departments, service gang, and Spring Garden office, one warrant; for the employés in the distribution department and holder-stations at Ninth and Diamond, Ninth and Mifflin and Twenty-fifth and Callowhill streets, one warrant; for the employés at the Ninth Ward Works, one warrant; for the employés at the Twenty-fifth Ward Works, one warrant; for the employés at the Twenty-sixth Ward Works, one warrant; for the employés on the Germantown, Frankford and Manayunk rolls, one warrant; employés of the Bureau of Gas are to be paid semi-monthly.

For the employés in the Bureau of Lighting, one warrant, payable semi-monthly.

For the Bureau of Water: For the employés of the hydrographic corps roll, one warrant, payment once every two months; for the employés at the pumping-stations, one warrant for each station, payment monthly.

The following employés in the Bureau of Water to be paid semi-monthly: For the employés in the Purveyors' districts, one warrant for each district; for the employés of the City construction and repair shop, one warrant; for the employés upon the improvement for distribution and contingent roll, one

warrant; for the employés upon the buildings, grounds and reservoirs roll, one warrant.

Warrants for the Director's office shall be drawn by the Director of the Department of Public Works; for the City Ice Boats, by the Superintendent of the City Ice Boats; all others by the chiefs of the respective bureaus, and approved by the Director of the Department of Public Works.

SECT. 11. All ordinances or parts of ordinances inconsistent herewith be, and the same are hereby repealed.

Approved the twenty-ninth day of December, A. D. 1890.

EDWIN H. FITLER,

Mayor of Philadelphia.

ANNUAL REPORT

OF THE

BUREAU OF WATER,

DEPARTMENT OF PUBLIC WORKS,

FOR THE YEAR 1890.

OFFICERS

OF THE

BUREAU OF WATER.

Chief,

JOHN L. OGDEN.

Assistants,

ALLEN J. FULLER, WILLIAM WHITBY.

Draughtsmen:

John E. Codman, James G. Davis, James J. Jefferson.

Chief Clerk—JOB T. HICKMAN.
Assistant Clerks—J. G. Dixon, Kennedy McNeal.
Correspondence Clerk—P. DeHaven.
Search Clerk—Thomas Spence.
Assistant Search Clerk—H. J. Johnson.
Assistant Clerk—William J. Duffy.
Time Clerk—William J. Innes.
Pipe Inspector—Theodore S. S. Baker.
Messenger—Haines Lewis.

Telephone Operators:

Mattie Whittingham, Calvin Craner.

General Superintendent,

FRANK L. HAND.

Clerk to General Superintendent—John A. Hayes.
Assistant Clerk to General Superintendent—John B. Wright.

Engineers at Pumping Stations:

FAIRMOUNT—*Engineers*, William H. Cubbler, John W. Bronson.
SPRING GARDEN—*Engineers*, David Pyke, H. A. Gideon, Abraham Stott, John L. McGinnis.

Telephone Operator—Fannie Shields.

BELMONT—*Engineers*, William Kiner, Thomas Seddon.
ROXBOROUGH—*Engineers*, Joshua Bartley, Archibald Weir.
MOUNT AIRY—*Engineers*, Lewis Culp, William Fletcher.
CHESTNUT HILL—*Engineer*, Henry W. Everly.
FRANKFORD—*Engineers*, Charles Douglas, William Maxwell.
KENSINGTON—*Oilers*, Peter J. Tuttle, Moses Holden.

Works-General.

Foreman Carpenter—Henry Guest.
Foreman Bricklayer—Frank A. Mooney.
Foreman Stonemason—Crawford Lukens.
Foreman Rigger—James Forrest.
Foreman Painter—Charles Ravenor.
Foreman Laborer—Matthew J. Richmond.
General Storekeeper—S. C. Buchanan.
Electrician—Henry P. Morgan.
Superintendent of Shop—W. F. Courtney.
Clerk to Superintendent of Shop—W. H. Winter.

Purveyors:

First District, John H. Holmes.
Clerk, William J. Mackey.
General Foreman, James Humes. *Foreman of Repairs*, **W. W. Wellington.**
Office, 1120 Wharton street.

Second District, David A. Craig.
Clerk, Charles H. Green.
General Foreman, Michael Young. *Foreman of Repairs*, **Edw. Homan.**
Office, 918 Cherry street.

Third District, Charles J. Lowry.
Clerk, J. A. Spanagle.
General Foreman, Elias Abrams. *Foreman of Repairs*, **Wm. Magee.**
Office, 1420 Frankford avenue.

Fourth District, John Montgomery.
Clerk, Arthur B. Cook.
General Foremen, George W. Showaker, James H. Forbes.
Foreman of Repairs, **James Hutchinson.**
Office, Twenty-sixth and Master streets.

Fifth District, Henry Dawson.
Clerk, **F. J. Cornman.** *General Foreman*, **Charles Frank.**
Office, Lyceum Building, Roxborough.

Sixth District, George H. Laut.
Clerk, **Jonathan Bonsall.** *General Foreman*, **Samuel Loeb.**
Office, Town Hall, Germantown.

ANNUAL REPORT

OF THE

BUREAU OF WATER.

DEPARTMENT OF PUBLIC WORKS,

FOR THE YEAR 1890.

Philadelphia, January 27, 1891.

GENERAL LOUIS WAGNER,

Director of the Department of Public Works.

SIR:—The following report of the operations of the Bureau for the year 1890 is respectfully submitted.

Receipts.

The statement of the receipts from water rents, etc., has been furnished by the Receiver of Taxes.

Total Receipts, Bureau of Water, for the Year 1890.

MONTHS.	Searches.	Delinquent Rents.	Delinquent Penalties.	Rents, 1890.	Penalties, 1890.	Fractional Rents.	Water Pipe.	Bureau of Water Dep'rtment of Public Works.	Totals.
January	$388 25	$1483 75	$199 60	.....	.....	$9,334 98	$10,007 46	$858 10	$22,272 14
February	396 75	1119 50	166 02	$264,771 85	.....	11,207 01	9,037 80	497 65	287,196 58
March	535 00	1852 32	234 99	352,746 05	.....	10,136 83	9,501 34	813 46	375,819 99
April	531 75	3428 90	432 27	1,077,629 17	.....	13,458 40	7,817 36	163 56	1,103,461 41
May	544 00	569 00	85 05	56,462 88	$2,808 25	19,410 74	10,513 57	247 19	90,640 68
June	450 25	5676 00	851 43	73,658 35	3,663 65	10,223 62	6,708 38	267 78	101,499 46
July	400 00	1953 08	293 00	14,577 75	2,072 99	26,395 62	15,620 52	632 62	61,945 58
August	313 50	3149 00	470 58	19,805 50	2,970 18	14,919 85	13,819 42	352 15	55,800 18
September	352 00	1072 50	160 90	25,472 40	3,818 12	9,900 66	15,870 54	348 55	56,995 67
October	482 25	2578 84	343 98	52,642 45	7,858 74	16,457 19	16,528 62	217 96	97,110 03
November	421 75	1783 00	263 79	13,913 00	2,057 10	19,165 07	13,064 81	558 58	51,227 10
December	420 25	806 50	121 08	6,872 55	1,021 91	11,291 18	13,394 45	4,773 23	38,701 15
Totals	$5,235 75	$25,472 39	$3,622 69	$1,958,551 95	$26,270 94	$171,901 15	$141,884 27	$9,730 83	$2,342,669 97

Receipts through the office of the City Solicitor, 1890	38,367 73
Total receipts of the Bureau of Water for the year 1890	$2,381,037 70
Receipts as previously estimated	.....

Items of Receipts under head of Fractional Rents.

YEAR.	Rents.	Meter rents	Ferrules	Repairs.	Totals.
1890	$66,224 25	$68,296 40	$33,407 25	$3,973 25	$171,901 15
1889	67,309 01	39,689 47	32,593 25	3,803 00	143,394 73
Increase	.....	$28,606 93	$814 00	$170 25	$28,506 42
Decrease	$1,084 76	.....	.....	.....	.....

Revenue for Ten Years, 1881 to 1890, inclusive.

YEARS.	Delinquent Water Rents.	Delinquent Penalties.	Water Rents.	Penalties.	Fractional Rents.	Water-Pipe.	Searches.	Chief's Office.	City Solicitor's Office.	Totals.
1881	$84,591 40	$12,627 66	$1,256,662 00	$19,234 38	$53,451 56	$47,489 11	.....	$5,549 01	$29,936 22	$1,509,541 34
1882	78,543 01	11,479 18	1,295,419 87	18,016 23	49,529 90	34,979 52	.....	7,515 88	21,421 05	1,516,904 64
1883	69,995 84	10,310 00	1,380,882 17	23,280 44	67,088 10	45,853 09	.....	8,515 11	21,144 41	1,627,069 16
1884	19,837 72	2,492 97	1,566,027 57	22,797 76	77,557 10	71,542 00	$461 50	10,670 89	21,098 20	1,792,486 01
1885	11,267 25	1,561 03	1,567,031 94	22,298 78	101,643 88	92,182 18	1,988 75	9,197 00	18,993 23	1,826,164 04
1886	15,049 50	1,964 42	1,637,296 69	21,377 89	97,219 62	122,743 91	2,960 00	10,121 36	24,594 95	1,933,328 34
1887	19,040 87	2,705 79	1,721,188 83	24,453 03	115,939 21	106,602 48	3,112 75	7,287 61	29,504 04	2,030,434 61
1888	13,995 04	1,948 54	1,793,432 38	23,584 86	113,550 16	123,667 85	4,158 25	7,742 45	22,846 97	2,114,926 50
1889	23,407 23	3,332 78	1,848,542 49	24,247 95	143,394 73	149,611 63	5,056 25	11,363 70	33,043 09	2,241,999 85
1890	25,472 39	3,622 69	1,958,551 95	26,270 94	171,901 15	141,884 27	5,235 75	9,730 83	38,367 73	2,381,037,70
Totals	$361,200 25	$52,045 06	$16,025,335 89	$225,562 26	$991,275 71	$946,556 04	$23,273 25	$87,693 84	$260,949 89	$18,973,892 19

Comparative Statement.

1890	$25,472 39	$3,622 69	$1,958,551 95	$26,270 94	$171,901 15	$141,884 27	$5,235 75	$9,730 83	$38,367 73	$2,381,037 70
1889	23,407 23	3,332 78	1,848,542 49	24,247 95	143,394 73	149,611 63	5,056 25	11,363 70	33,043 09	2,241,999 85
Increase	$2,065 16	$289 91	$110,009 46	$2,022 99	$28,506 42	.....	$179 50	.....	$5,324 64	$139,037 85
Decrease	.....	.....	.....	.....	.....	$7,727 36	.....	$1,632 87	.....	.....

Fractional Rents 1890.

Months.	Rent.	Ferrules.	Repairs.	Meters.	Totals.
January	$3,571 87	$376 00	$144 00	$5,243 11	$9,334 98
February	6,208 39	424 00	92 00	4,482 62	11,207 01
March	7,516 59	2,008 00	224 00	388 24	10,136 83
April	9,563 47	3,130 50	352 00	412 43	13,458 40
May	7,831 80	2,944 00	375 25	8,259 69	19,410 74
June	6,660 87	3,186 75	376 00		10,223 62
July	5,085 29	3,239 00	356 00	17,715 33	26,395 62
August	4,028 94	3,508 00	290 00	7,092 91	14,919 85
September	4,378 28	4,307 00	364 00	851 38	9,900 66
October	3,620 07	3,344 00	488 00	9,005 12	16,457 19
November	2,463 09	6,079 00	704 00	9,918 98	19,165 07
December	5,295 59	861 00	208 00	4,926 59	11,291 18
Total	$66,224 25	$33,407 25	$3,973 25	$68,296 40	$171,901 15

The revenue, which includes $38,367.73 collected by the City Solicitor from liened water-pipe claims, amounts to $2,381,037.70, which is an increase of $139,037.85 over the previous year.

For a list of the receipts from the office of the Chief of the Bureau, see Appendix A.

Expenditures.

The net appropriation to this Bureau for the year was $1,313,253.00, of which $600,000.00 was for extensions.

The sum of $57,775.11 was available from the previous year from moneys due on uncompleted contracts, making a total amount of $1,371,028.11.

The expenditures were:

For current expenses	$712,497 37
For extensions	255,294 74
For extensions out loan	25,572 18
Total	$993,364 29
Amount not merging	352,080 48
Amount merging	25,583 34
The amount due on unpaid bills is approximately	$10,500 00

The insufficient appropriation to Item 8 caused much trouble to builders, which was partially relieved by the passage of an ordinance dated June 19, authorizing them to purchase and lay water-pipes and pay fifty cents per foot instead of one dollar, the amount charged when the City does the work.

An ordinance, approved July 1, appropriated a lot of ground in the Twenty-first Ward upon which to build a reservoir. The bond of the City was approved on December 10 and filed on December 12.

On June 9, the sum of $400,000.00 was appropriated for the commencement of the work.

On November 7, after due advertisement, a contract was awarded for building the banks, but owing to the lateness of the season very little work has been done.

For expenditures in detail see Appendix B.

Appropriations and Expenditures.

Appropriation, December 28, 1889.			Amount appropria'd	Amount expended.	Amount merging.	Amount not merging.
Item 1. For salaries:						
Office, Chief of Bureau, etc	$97,858 00			$93,879 89		
Pumping Stations	79,195 00			79,033 30		
	$177,053 00					
Transferred to Item 5	$ 500					
Transferred to Item 8	1,000	$1,500 00	$175,553 00	$175,413 10	$139 90	
Item 2. For general supplies, including fuel, oil and small stores		$145,000 00				
Transferred to Item 5	$1,000					
Transferred to Item 8	5,000	6,000 00	139,000 00	138,968 31	31 69	
Item 3. For repairs to machinery, including the conveyance of workmen incident thereto			50,000 00	49,919 78	80 22	
Item 4. For maintenance and repairs to buildings, grounds and reservoirs			50,000 00	49,672 34	327 66	
Item 5. For repairs and improvement of the distribution, including the purchase of material and cost of labor in connection therewith and expenses incident thereto		$85,000 00				
Transferred to from Item 1	$ 500 00					
" " 2	1,000 00					
" " 6	1,000 00					
" " 9	204 09					
From other Bureaus	2,295 91					
	$5,000 00		90,000 00	89,952 34	47 66	
Item 6. Supplies and labor at City shop		$75,000 00				
Transferred to Item 5	1,000 00		74,000 00	73,925 84	74 16	

Appropriations and Expenditures—Continued.

General Appropriation.		Amount appropria'd	Amount expended.	Amount merging.	Am'nt not merging.
Item 7. For general, incidental and contingent expenses, including keep of horse for chief of bureau, general superintendent and assistant to chief, each $400	$14,000 00				
Transferred to from other bureaus	700 00	$14,700 00	$14,667 76	$32 24	
Item 8. For the purchase of material and cost of labor in connection with laying of service pipes and expenses incident thereto	$100,000 00				
Transferred to, from Item 1 ..... $1000 00					
From Item 2 5000 00					
Other bureaus 14,000 00					
	$20,000 00	120,000 00	119,977 90	22 10	
Item 9. Extensions.....	$200,000 00				
Balance from books 1889	8,859 67	208,859 67	206,379 30	1,399 89	$1,080 48
Item 9. Appropriation for 1889, for 48" main from East Park Reservoir to Lehigh Basin, balance from books of 1889 ...	$49,119 53				
Transferred to Item 5...	204 09	48,915 44	48,915 44		
Item 9½. For a new reservoir at Roxborough.....		400,000 00	25,572 18	23,427 82	351,000 00

PUMPAGE.

The total number of gallons pumped was as follows:

Fairmount Station	12,362,987,130	
Spring Garden Station	27,036,016,353	
Belmont Station	4,651,210,091	
Roxborough Station	2,952,650,279	
Chestnut Hill Station	89,271,100	
Frankford Station	3,161,124,783	
Kensington Station	20,636,742	
Total		50,273,896,478
Supplementary Lift. Roxborough	16,194,294	
Supplementary Lift. Mount Airy	419,420,751	
Supplementary Lift. East Park	988,997,176	
Total		1,424,612,221
A grand total of		51,698,508,699

Total Gallons Pumped During 1890.

Month.	Water Power.	Steam Power.	Totals.	Average Gallons per Day.
January	1,150,340,245	2,533,707,727	3,684,047,972	118,840,257
February	1,047,321,293	2,406,069,562	3,453,390,855	123,335,387
March	1,133,176,675	2,444,310,030	3,577,486,705	115,402,796
April	1,135,250,594	2,919,807,355	4,055,058,449	135,168,614
May	1,177,417,977	2,992,581,923	4,169,999,900	134,516,126
June	1,090,580,237	3,474,012,026	4,554,592,263	151,819,742
July	863,192,638	4,000,788,381	4,863,981,019	156,902,613
August	761,375,629	4,079,449,185	4,840,824,814	156,155,689
September	914,719,467	3,924,425,166	4,839,144,635	161,304,821
October	1,036,269,165	3,722,829,338	4,759,098,503	153,519,306
November	1,093,317,438	3,450,929,215	4,544,246,653	151,474,888
December	970,025,772	3,386,611,161	4,356,636,933	140,536,675
Totals	12,362,987,130	39,335,521,569	51,698,508,699	141,639,749

The following table shows the gallons of water pumped, the cost per million gallons, and the daily consumption per capita during the ten years from 1881 to 1890, inclusive:

Pumpage Tables for the Years 1881 to 1890, inclusive.

Year.	No. of gallons pumped to Reservoirs.	No. of gallons pumped 100 feet high.	Cost per million gallons pumped 100 ft. high.	Gallons per capita per day.	Estimated population.
1881	22,721,014,838	34,238,528,111	$6 88	71	869,000
1882	24,691,440,430	37,873,302,258	6 66	76	890,000
1883	25,284,957,251	37,949,320,701	6 51	75	911,000
1884	25,495,179,353	39,001,865,294	5 54	74	932,000
1885	25,165,020,072	39,308,901,886	4 70	72	953,000
1886	28,658,966,569	46,255,361,203	4 13	80	975,000
1887	32,426,779,765	51,289,948,331	3 99	89	995,000
1888	37,068,763,428	59,483,831,199	4 49	100	1,020,000
1889	42,518,919,781	69,034,118,434	3 87	110	1,050,000
1890	51,698,508,699	84,501,451,686	3 05	132	*1,046,964

*U. S. Census.

The increase in the gallons consumed was 7,754,976,697, or over fourteen per cent., which is the same as during the two preceding years.

About twenty-five per cent. of the pumpage was by water power, and seventy-five per cent. by steam; that by steam increased twenty-two per cent., and by water power eight per cent.

Of the total consumption only six per cent. was drawn from the Delaware River.

The daily average consumption was 141,639,749 gallons, an increase over 1889 of twenty-one per cent.

The maximum pumpage in one day was 170,600,577 on September 14, and the minimum 61,956,522 on March 3.

The cost of pumpage has been reduced to $3.05 per million gallons raised 100 feet high.

The engine at Kensington Station was in service during 69 hours in January, during which time it pumped 20,636,742 gallons.

This engine house was abandoned as a pumping station and the machinery removed to and erected at the Spring Garden Works, where it did good service during the balance of the year.

The following table shows the quantity of water pumped at Fairmount since 1880. The increase is due to improvements in some of the pumps and wheels.

The greatest pumpage in one day was 41,494,536 gallons. With some additional changes this can be increased to fifty millions with very little addition to the quantity of water required for power.

Table.

Year.	Gallons per 100 Feet.	Repairs.	Cost per Million Gallons.
1881	7,575,326,689	$2,197 72	$2 21
1882	9,377,468,635	2,733 95	1 74
1883	9,757,096,729	2,992 62	1 45
1884	8,575,107,594	2,795 33	1 35
1885	6,847,346,991	7,893 91	2 33
1886	7,282,553,795	9,895 87	2 23
1887	10,105,736,663	5,582 83	1 18
1888	11,241,113,103	6,958 00	1 44
1889	11,413,836,469	4,800 44	1 24
1890	12,362,987,130	4,900 00	91

The following table shows the gallons of water pumped by each wheel, the hours stopped and the cause:

Fairmount Pumping Station, 1890.

Wheels.	Total Pumpage.	Hours pumped.	Hours shut down. High water.	Hours shut down. Low water.	Hours shut down. Muddy water.	Hours shut down. Full basin.	Hours shut down. Repairs.
1	857,673,600	8.515	29	172	.....	10	34
3	2,069,424,200	7.515	31	6	.....	30	1,178
4	2,350,743,186	8.552	71	65	33	.....	72
5	2,130,812,994	8.302½	75	239	33	39	71½
7	1,691,401,400	7.293	56½	1,029	.....	33	315½
8	1,726,079,550	7.409	62½	987	.....	40	261½
9	1,536,852,200	6.606	18½	1,122	.....	40	973½
	12,362,987,130	54.192½	343½	3,620	66	192	2,906

A comparison of the above table with a similar one of the previous year is interesting. During 1889 the wheels were stopped 4,533½ hours on account of full basins. In 1890 they were shut down for the same reason only 192 hours. This is owing to the connection with the East Park Reservoir.

Wheels Nos. 1 and 3 pump into Fairmount basin alone; all of the others into the East Park Reservoir, from which the water is drawn into the Corinthian avenue and Lehigh avenue basins.

During 1889 the wheels were stopped 893 hours for high water, while in 1890 but 343½ hours. On account of low water they were stopped 3,620 hours as against 166½ hours in 1889. During 1890 the rain-fall and flow of the river was much less than during the previous year.

Rain-Fall.

The rain-fall observations have been continued by our own employés and volunteer observers. The total rain-fall at Thirty-second and Spruce streets was 34.68 inches, nearly

sixteen inches less than during 1889. The greatest fall of water was during the storm of March 22 and 23, when 0.32 inches fell in eight minutes.

For report in detail see Appendix F.

Flow of the Schuylkill.

The flow of the river was less than during the previous year. There were 194 days when no water was wasted over the dam at Fairmount, and 171 days during which a total of 88 feet 5 inches was wasted, or less than half of the amount wasted during 1889, when 195 feet 10 inches went over. The highest flood was 29 inches. March was the month of greatest flow, and November the month of the least.

The following is an estimate of the waste over the flash boards of Fairmount dam and the flow of the river:

January	8,165,132,704	gallons.
February	20,995,212,191	"
March	39,928,443,009	"
April	6,564,948,430	"
May	24,446,177,609	"
June	7,635,519,848	"
July	6,155,863,009	"
August	13,769,471,533	"
September	8,904,529,540	"
October	39,342,241,860	"
November	2,703,534,118	"
December	5,992,197,794	"
Total	184,603,271,645	"
Gallons pumped, steam	37,910,909,348	
Gallons pumped, water	12,362,987,130	
Used for power	370,889,613,900	
Leakage	2,555,000,000	
Total	608,321,782,023	gallons.

An average daily flow of 1,666,635,019 gallons.

Quality of the Water.

In December, two samples of water were taken at each of the following stations: Roxborough, from Flat Rock Dam; Spring Garden and Fairmount, from the Fairmount Pool, and

sent to Professor N. Wiley Thomas, at Girard College for analysis. They were numbered as follows: those taken at Roxborough, Nos. 1 and 4; at Spring Garden, Nos. 2 and 5, and Fairmount, Nos. 3 and 6.

The following is a copy of Professor Thomas' report.

"1504 CENTENNIAL AVENUE,

"*Philadelphia, January 10, 1891.*

"MY DEAR SIR:—I have the honor to submit herewith the results of the chemical analyses of the several samples of water received some time since from the Bureau of Water.

"The samples were all clear, and in the best condition. The organic matter found was not inconsiderable, but there can be no doubt that it is of vegetable origin, and therefore not to be regarded with the same suspicion that it otherwise would be.

"In no case does the albuminoid ammonia reach 0.015, so that it is not necessary to direct special attention to it.

"There does not appear to be any conspicuous difference in the samples, except that 1 and 4 show the most undecomposed, and 2 and 3 the most oxidized organic matter; 5 and 6 appear to be the best.

"The chlorine is in every case low.

"Very truly yours,

(Signed) "N. WILEY THOMAS.

"JOHN L. OGDEN, ESQ.,

"Chief of Bureau of Water."

	PARTS PER 100,000.				GRAINS PER GALLON.		
No.	Fr. Ammo.	Alb. Ammo.	Nc. Acid.	Ns. Acid.	Ox'n. req. to ox. org. subs.	Chl.	To. Slds.
1	0.0026	0.0128	0.400	0.00007	0.254	0.35	10.01
2	0.0052	0.0125	0.550	0.00003	0.147	0.40	11.17
3	0.0013	0.0110	0.650	0.00005	0.147	0.38	9.45
4	0.0066	0.0130	0.400	0.00009	0.139	0.40	10.65
5	0.0010	0.0090	0.200	0.00005	0.220	0.38	9.18
6	0.0010	0.0110	0.300	0.00005	0.155	0.35	9.17

These analyses show that there is very little difference chemically between the water drawn above Manayunk and that below; lower Fairmount Pool being somewhat better than Flat Rock Dam.

Fairmount Pool can be improved by making provision for draining Pencoyd and West Manayunk into the intercepting sewer.

It is suggested that a sewer be built along the west bank above the northern boundary of the Park for the use of these villages and the sewage pumped across the river through a pipe of suitable size laid on one of the bridges.

The following estimate provides for an egg-shaped sewer 18 inches wide and 27 inches deep with a grade of 1 in 1000, connected with a well at the west end of City avenue bridge, from which the sewage is pumped by a suitable engine or water power through a 12-inch pipe placed on the lower chord of the bridge to the intercepting sewer near the river drive at the east approach.

The lift from the bottom of the well to the lower chord of the bridge will be about forty-five feet. It is proposed to pass the sewage through a filth-house containing screens before being pumped, so that all solid matter may be extracted and burned.

The estimate includes the purchase of a dam having an elevation of seventy feet above the end of the sewer to be used for flushing and probably for driving a turbine, and pumping across the river.

Approximate Estimate.

For purchase of 1½ acres of land, repairing dam, and laying 6-inch pipe	$ 4,800 00
12,000 lineal feet of sewer, at $2.50	30,000 00
Well, filth-house and engine-house	4,000 00
Engine, boilers, etc., or turbine and pump	3,500 00
Pipe on bridge and connections with pump and intercepting sewer	3,500 00
Engineering, inspection, etc	2,500 00
Contingencies	1,700 00
Total	$50,000 00

The East Park Reservoir, holding more than 370,000,000 gallons, supplies nearly all that part of the City north of South street, when the water in the river is muddy and the pumps are stopped at Fairmount, except Germantown, Manayunk and Frankford.

If all of the water were used out of this reservoir, the supply would not last more than one week. If the river continues muddy for a longer period, pumping must be resumed and the water distributed is necessarily objectionable in color.

This condition exists to a greater degree in the other parts of the City, with the exception of Frankford.

Germantown, Manayunk and the lower wards have practily no benefit from subsidence; the basins furnishing water to these localities hold but two or three days' supply, and pumping must be continuous.

Belmont basin holds only four or five days' supply for West Philadelphia.

In order to furnish clear water at all times additional subsiding basins are necessary, or the water must be filtered. One such basin has been begun at Roxborough; another has been recommended and a site selected for the direct pumpage district, and a third for West Philadelphia must be provided in the near future.

Pumping Stations.

The following are some of the most important improvements and changes at the pumping stations.

At Fairmount the dam was put in good condition. The crib work that had been carried away during the previous year was brought back and sunk in place. About 1000 perch of stone were used to fill the pockets in it and other sections, and new deck timbers replaced those which were decayed.

No. 3 turbine was furnished with a glass suspension bearing.

At Spring Garden the pumping mains have been supported with stone masonry which has been the means of stopping the

leaks, and has enabled us to put the grounds in order. Owing to the digging up of the mains to repair leaky joints the terraces have been in an unsightly condition for years.

A Worthington engine was brought from the Kensington station and set up in the old engine house. It was of great service during the summer

At Roxborough a serious break occurred. The high pressure piston of No. 2 Worthington engine broke and the district would have been out of water before a new one could have been made. It happened that the cylinders of one of the engines at another station were of the same size and the broken piston was replaced in a few days with one taken from Belmont.

The Cornish engine was sold and the purchaser is now taking it down; this will leave room for a new engine which is needed as a reserve for use in case of accident to the others.

A gauge showing the height of water on the Flat Rock dam has been set up and the state of water reported daily, as at Fairmount.

Electric light plants have been established at Roxborough and Frankford stations.

New fences were placed around the Roxborough and Mount Airy basins, and the roadways of East Park and Lehigh avenue basins curbed and graded for paving with vitrified bricks.

At Mount Airy, granite curbs were set along the street lines, and a granolithic pavement laid.

For work in detail see Appendix C.

Distribution.

One hundred and fifty-nine thousand one hundred and seventy-six, or thirty miles and 776 feet of pipes from six to forty-eight inches in diameter have been laid during the year, making the total now in use about 959 miles and 2813 feet.

Six hundred and twenty-two fire hydrants have been placed in new locations, making a total number of 7749.

The forty-eight inch supply main, from the East Park reservoir to Sixth and York streets, was completed and water passed through on April 29th. The completion of this main enabled us to abandon the Kensington works as a pumping station.

A forty-eight inch pumping main, from Spring Garden works to the East Park reservoir, has been completed and 1698 feet of forty-eight inch pipe laid south from the same reservoir, the commencement of a supply main to the lower part of the city.

On August 25th a serious break occurred in the forty-eight inch pumping main running from Fairmount to the Corinthian avenue basin. These pipes have been in use twenty-five years and were the first pipes of that size laid in the city.

Pipe Inspection.

The following table shows the work done by the Pipe Inspectors during the year:

Pipes and Specials.	Inspected.	Rejected.	Total Accepted.
4-inch pipes	118	18	100
6-inch pipes	15,089	3,047	12,042
8-inch pipes	108	8	100
10-inch pipes	353	53	300
12-inch pipes	1,129	129	1,000
16-inch pipes	60	10	50
30-inch pipes	125	25	100
36-inch pipes	95	12	83
48-inch pipes	1,086	86	1,000
Small specials	5,537	955	4,582
Large specials	129	7	122
Total pieces	23,829	4,350	19,479

Meters.

Two hundred and seventy meters have been set in new locations. The total number in use on December 31st, was five hundred and twenty-two.

For report in detail, see Appendix D.

Construction and Repair Shops.

The following table shows the principal work performed at the shop, from 1879 to 1890, inclusive:

Year.	Fire Hydrants.	Stop Valves.	Frames and Covers.	Ferrules.
1879	276	198	60	715
1880	314	149	212	3,649
1881	435	237	372	3,085
1882	596	336	596	3,506
1883	729	328	423	4,799
1884	198	367	588	4,966
1885	451	667	653	7,155
1886	626	953	927	8,480
1887	606	549	466	8,041
1888	627	701	1,125	10,005
1889	969	844	729	11,747
1890	759	953	800	11,250

For work in detail, see report of Mr. W. F. Courtney, Appendix E.

Hydrographic Work.

Observations of the rain-fall on the water sheds and the stream flow of the Perkiomen, Tohickon and Neshaminy creeks have been continued during the year. The rain-fall and stream flow were much less than during 1889, but greater than the average of the past seven years.

The rain-fall shown by the automatic recording gauge at Thirty-second and Spruce streets was 34.68 inches, nearly 16 per cent. less than during 1889.

Some experiments are in progress at this station with rain gauges of different diameters set at different heights above the ground. The results show a difference in favor of the lower elevations.

For tables showing results of stream flow observations and other details of hydrographic work, see Appendix F.

Permits and Inspections.

During the year, 8330 permits for house connections were issued.

The re-inspection of the First Ward is in progress, but the results cannot be tabulated in time for this report.

Respectfully,

JOHN L. OGDEN,

Chief of Bureau.

APPENDIX A.

Receipts through the Office of Bureau of Water, Department of Public Works, for the year 1890.

January	2	Southwark Foundry	Fire Connection	$165 20
	18	John Leright	For repairing fire hydrant	68 24
	22	Cramp's Eng. & S. B. Co	For repairing fire hydrant	2 85
	24	Louis Wanner, Jr	For repairing fire connection	13 52
	27	Henry Snyder	For rent at Fairmount	600 00
	31	Daniel A. Rumely	Repairing main	8 29
February	3	Joshua Hollingsworth	Amount of overdrawn warrant, No. 95	29 04
	7	R. B. Swain & Co	Fire connection	67 96
	10	A. Purvis & Son	Old material	91 69
	17	Baldwin Locomotive Works	Fire connection	74 43
	17	Baldwin Locomotive Works	Fire connection	88 09
	24	Claus Spreckles	Supply connection	79 85
	24	Claus Spreckles	Supply connection	66 59
March	1	William Root	Rent farm No. 4	102 50
	7	Goodfellow & Eddleman	Stone	5 00
	7	John W. Harris	Rent farm No. 2	100 00
	7	A. M. Harris	Rent farm No. 1	100 00
	10	Kedward & Thorpe	Repairing fire connection	56 95
	10	Jewish Hospital	Supply connection	49 82
	13	Wood & McGill	Fire connection	84 21
	18	Howard Yocum	Stone	21 25
	18	Germantown Electric L. Co.	Supply connection	67 98
	22	Allison Manufacturing Co	Fire connection	99 50
	24	S. L. Allen & Co	Fire connection	68 29
	29	Charles Theisweser	Supply connection	57 96
April	8	P. & R. R. R. Co	Rep. supply connection	10 87
	14	George W. Wills	Rent Farm No. 3	76 25
	16	Long Bros. & Co	Fire connection	47 66
	17	H. C. Eyre	Repairing main	28 78

890, BY WARDS.

23	24	25	26	27	28	29	30	31	32	33	34	Total.
			1									4
	4	1	2	2	10	1			3	2		44
2	1	3	2		11	3	1	1	2	2	2	79
3	6	10	8	2	13	10	4	12	4	17		230
13	231	10	63	194	609	245	9	4	332	45	4	2,401
4	53	4	10	6	12	37	4	3	17	29	2	845
100	782	393	802	388	1,688	384	77	128	287	838	129	7,262
	16				5							70
	1				2	1			3			16
1	1	3	5		6	4	1	2	3		1	77
48	87	46	86	64	166	31	7	10	32	132	48	1,314
11	34	13	7		11	18					10	188
				1								1
2	31	17	18	17	7	21	8	20	14	6	10	577
6				4			1					31
		1			11	1			2	1		27
163	829	334	781	461	1,568	379	20	111	432	995	268	8,954
	2	1		2		1						10
1		1			16	5		2	2	1		59
				2	3				1			12
	1				3							38
7					1					7		39
180	791	523	790	410	1,698	332	80	127	255	918	181	8,330
	1		1			1						11
1					1							9
				1		1						5
	1				1	1					1	18
								4				32

Receipts through the Office of Bureau of Water, Department of Public Works, for the year 1890—(Continued).

May 1...	Quaker City Croquet Club...	Rent 22nd and Brown streets	$10 00
16...	Phila. Traction Co.....	Relaying main.....	172 46
17...	Merritt & Thornton.....	Repairing main.....	10 48
23...	Thomas Gain.....	Stone.....	10 00
28...	Holmesburg Water Co.....	1 No. 1 fire Hydt. & 6 in. stop	44 25
June 3...	Merritt & Thornton.....	Stone.....	3 00
3...	American T. & T. Co.....	Removing fire hydrant.....	17 88
6...	Francis W, McDowell.....	Fire connection.....	71 38
6...	John H. Boyer.....	Old fence Mt. Airy.....	15 00
10...	A. Harmer.....	Stone.....	10 00
14...	Merritt & Thornton.....	Repairing main.....	10 87
14...	Col. Wm. B. Mann.....	Old style stop.....	1 72
17...	Allison Man'f. Co.....	Rep. fire connection.....	106 46
27...	Germantown Poor House.....	Rep. supply main.....	31 47
July 10...	Henry Snyder.....	Rent at Fairmount.....	600 00
28...	Sullivan Bros.....	Making attachments.....	21 82
29...	William Carter.....	Stone.....	7 80
Aug. 6...	Baldwin Locomotive Works.	Repairing private stop.....	6 50
11...	C. A. Bradenbright.....	Fire connection.....	57 10
12...	Sullivan Bros.....	Relaying main.....	93 18
15...	Folwell Mf'g. Co.....	Supply connection.....	51 87
16...	Baldwin Locomotive Works..	Removing fire hydrant.....	8 90
16...	Philadelphia Traction Co.....	Removing fire hydrant.....	42 03
August 22...	Cold Storage Warehouse Co..	Relaying main.....	48 66
22...	J. A. Cregan.....	Penalty for use of fire plug....	5 00
23...	P. W. & B. R. R. Co.....	Removing fire connection....	38 91
September 2...	William Root.....	Rent farm No. 4.....	102 50
9...	Charles A. Porter.....	Lowering main.....	47 50
9...	W. B. Bement & Co.....	Supply connection.....	25 33
10...	H. M. Harris.....	Rent farm No. 1.....	100 00
11...	Stinson Bros. & Kurlbaum...	Fire connection.....	67 33
24 ..	Philadelphia & R. R.R. Co...	Removing fire hydrant.....	5 89
October 3...	Sullivan Bros.....	Relaying main.....	108 65
6...	A. Guiges.....	Supply connection.....	11 20

Receipts through the Office of Bureau of Water, Department of Public Works, for the year 1890—(Continued).

October 13	Harrison, Frazier & Co	Repairing private stop	$4 00
18	E. E. Davis	Old fence	15 00
23	Athletic Club S. N	Removing fire hydrant	15 39
25	Southern Steamship Co	Fire connection	63 72
November 12	Philadelphia Traction Co	Removing stops	18 81
12	Philadelphia Traction Co	Removing stops	19 84
12	Philadelphia Traction Co	Removing stops	25 11
13	Sullivan Bros	Relaying main	59 29
15	Penn Mutual Life Ins. Co	Supply connection	24 97
15	Aramingo Mills Co	Replacing stop on fire connection	7 02
17	Edwin H. Price	Ashes	10 00
17	Girard Trust	Supply connection	47 06
28	John B. Stetson & Co	Supply connection	6 12
28	Refund of Overdrawn Warrant No. 2571		40
28	Granville B. Haines	Supply connection	27 47
29	John Bonhage	Repairing main	21 42
29	P. Deehan	Repairing main	93 81
29	P. Deenan	Repairing main	197 26
December 8	Joseph Ladley	Stone	83 60
10	Gilbert & Bacon	Motor connection	47 31
10	University of Pennsylvania	Removing fire hydrant	42 63
10	Bijou Theatre	Fire connection	69 70
11	Patrick J. Ryan	Relaying private pipe	64 61
12	Jos. McClure & Son	Old engine, Roxborough	825 00
15	Bussenius & Cunliffe	Scrap iron	1,942 18
17	Bussenius & Cunliffe	Scrap iron	534 48
20	Kugler, Brickley & Fields	Removing fire hydrant	10 93
29	John W. Harris	Rent Farm No. 2	100 00
29	Israel Fleishman	Fire connection	68 94
30	L. O. Howell	Supply connection	18 04
30	J. B. Winpenny	Fire connection	52 75
30	Martin Burke	Old material	500 00
30	A. Purves & Son	Old material	413 06
		Total	$9,730 83

APPENDIX B.

REPORT OF CHIEF CLERK.

BUREAU OF WATER.

Philadelphia, January 24, 1891.

MR. JOHN L. ODGEN,

Chief of Bureau of Water.

SIR:—I have the honor to submit herewith a detailed statement of the expenditures of this Bureau for the year 1890.

Respectfully,

J. T. HICKMAN,

Chief Clerk.

Detailed Expenditures of the Bureau for 1890.

General Appropriation.	Amount appropria'd	Amount expended.	Amount merging.	Amount not merg'g.
An Ordinance to make an appropriation to the Bureau of Water, approved Dec. 28, 1889.....$896,553 00				
Balance from books of 1889, 57,979 20				
Increased by transfer..... 16,995 91				
Extra appropriation..... 400,000 00				
Net appropriation.....$1,371,028 11				
Item 1, Salaries.....$177,053 00				
Diminished by transfer to Item 5..... $500 00				
To Item 8..... 1,000 00				
$1,500 00				
Net appropriation to Item.....	$175,553 00			
For salary of Chief of Bureau.....	6,000 00	$6,000 00		
Chief clerk.....	2,000 00	2,000 00		
Assistant clerk	1,080 00	1,080 00		
Correspondence clerk.....	900 00	900 00		
Time clerk.....	900 00	900 00		
Messenger.....	650 00	650 00		
Draughtsmen.....	3,700 00	3,450 00		
General superintendent.	3,500 00	3,500 00		
Clerks to general superintendent	1,750 00	1,750 00		
Assistants to chief.....	3,200 00	3,200 00		
Pipe inspector and clerk.....	2,050 00	2,050 00		
Search clerk.....	1,100 00	1,100 00		
Assistant clerks	3,650 00	3,650 00		
Chief inspector.....	1,100 00	1,100 00		
Inspectors.....	17,100 00	17,031 30		
Permit clerks	2,080 00	2,080 00		
Purveyors.....	9,000 00	9,000 00		
Clerk to purveyors.....	4,320 00	4,308 00		
General foreman.....	6,573 00	6,573 00		
Foreman, repairs.....	3,900 00	3,900 00		
Superintendent of shop.	1,500 00	1,500 00		
Clerk to superintendent of shop.....	900 00	900 00		
Watchmen office, reservoir and yards.....	16,875 00	16,478 73		
Storekeepers.....	1,400 00	1,400 00		
Foreman of bricklayers.	1,000 00	1,000 00		
" " carpenters...	1,000 00	1,000 00		
" " stone masons	900 00	900 00		
Foreman of painters.....	900 00	900 00		
" " riggers.....	900 00	900 00		
" " laborers....	840 00	840 00		
Policeman, $40 each for uniforms.....	2,860 00	2,850 93		
Janitor main office	675 00	675 00		
Janitors.....	3,600 00	3,579 03		
River watchman.....	850 00	850 00		
Lineman.....	720 00	720 00		
Telephone operators.....	960 00	960 00		
Electrician	900 00	900 00		
General storekeeper.....	900 00	900 00		
SALARIES AT PUMPING STATIONS.				
Fairmount engineers and oilers.....	6,087 50	5,962 50		
Spring Garden engineers, oilers, firemen and coal passers.....	27,452 50	27,052 11		

Detailed Expenditures of the Bureau for 1890.

General Appropriation.		Amount appropria'd	Amount expended.	Amount merging.	Amount not merg'g
Item 1, continued.					
Belmont engineers, oilers, firemen and coal passers		$9,100 00	$9,086 29		
Roxborough engineers, oilers, firemen and coal passers		8,820 00	8,628 75		
Mt. Airy engineers and coal passers		2,970 00	2,970 00		
Chestnut Hill engineers and helper		1,500 00	1,500 00		
Frankford engineers, oilers, firemen and coal passers		7,850 00	7,697 46		
Kensington oilers and firemen		1,040 00	1,040 00		
Totals		$177,053 00	$175,413 10	189 90	
Item 2. For general supplies including fuel, oil and small stores	$145,000 00				
Diminished by transfer to Item 5	$1,000 00				
To Item 8	5,000 00	$6,000 00			
Net appropriation to Item		139,000 00			
Deficiencies of 1889:					
Coal			5 75		
Axle grease			14 77		
COAL FOR OFFICES.					
6 tons stove, at $5.75	$34 50				
9 tons stove, at $4.79	43 11				
15 tons stove, at $4.25	71 25				
25 tons stove, at $4.53	113 25				
27 tons stove, at $5.71	154 17				
			416 28		
COAL FOR SHOP.					
4.15 tons nut, at $4.33	$20 61				
54.11 tons bit., at $3.59	195 76				
347.16 tons pea, at $2.80	973 79				
			1,190 16		
COAL FOR STATIONS.					
3,022.10 tons pea, Spring Garden, at $2.35	$7,102 87				
34,283.10 tons pea, Spring Garden, at $2.03	69,595 51				
10,037.02 tons pea, Belmont, at $2.03	20,375 32				
276.11 tons pea, Roxborough at $2.35	649 89				
9,337.01 tons pea, Roxborough, at $2.03	18,954 22				
1,152.15 tons pea, Chestnut Hill, at $2.40	2,766 60				
3,835.19 tons pea, Frankford at $2.15	8,247 30				
			127,691 71		
Cement			2,615 10		
Coke			443 45		
Hauling Coal: Roxborough to Rox. Auxiliary, 92½ tons, at 41¾ cts.	$38 60				

Detailed Expenditures of the Bureau for 1890.

General Appropriation.		Amount appropria'd	Amount expended.	Amount merging.	Amount not merg'd
Item 2, continued.					
Chestnut Hill to Mt. Airy, 52.11 tons, at 43 cts.....	22 60				
Chestnut Hill to Mt. Airy, 895.16 tons, at 41¾ cts.....	373 96				
		.....	$435 16		
Lamps.....		.....	60 00		
OIL.					
100 gals. Arctic, at 14 cts.....	$14 00				
192$\frac{5}{6}$ gals. black, at 8 cts.....	15 40				
62 gals. castor, at $1.00.....	62 00				
5,268 gals. cylinder, at 45 cts..	2370 62				
1,941½ gals. engine, at 35 cts..	679 53				
215 gals. gasoline, at 14 cts.....	30 10				
1,225 gals. gasoline, at 13 cts...	159 25				
615½ gals. head-light, at 10 cts.	61 55				
252½ gals. lard, at 53 cts.....	278 52				
1,039 gals. lard, at 51 cts.....	529 89				
308⅓ gals. linseed, at 57 cts...	175 71				
878½ gals. yellow, at 9½ cts..	83 47				
		.....	4,460 04		
Packing.....		.....	10 01		
Paints, &c.....		.....	29 05		
Stop valves:					
1—12-in. x 6-in.—3 way.....	$83 00				
2—10-in. x 6-in.—3 way, at $66.00.....	132 00				
4—6-in.—4 way, at $62.00.....	248 00				
24—6-in.—3 way, at $28.50...	684 00				
		.....	1,147 00		
Soap.....		.....	69 83		
Soda.....		.....	3 75		
Tallow, 650 lbs., at 6½ cts.....		.....	42 25		
Towing.....		.....	124 00		
Wood, 28 cords, at $7.50.....		.....	210 00		
Totals.....		.....	$138,968 31	31 69	
Item 3. For repairs to machinery, and the conveyance of workmen incident thereto		$50,000 00			
Deficiencies of 1889:					
Freight...	$2 83				
Repairs to boilers.....	35 80				
		.....	$38 63		
Armature.....		.....	60 00		
Belting.....		.....	89 75		
Brass fittings.....		.....	1,237 34		
Castings.....		.....	19 60		
Chandlery.....		.....	921 56		
Fire brick, Spring Garden.....	$323 50				
Belmont.....	85 50				
		.....	409 00		
Freight.....		.....	5 32		
Gum Goods.....		.....	1,088 72		
" Valves.....		.....	1,515 70		
Hardware.....		.....	369 01		
Iron Castings:					
3,225 lbs. at $1.80	$58 05				
15,975⅛ " at 2¼ cts.....	359 45				

Detailed Expenditures of the Bureau for 1890.

General Expenditures.		Amount appropria'd	Amount expended.	Amount merging.	Amount not merg'g
Item 3, continued.					
63,300 " at 2½ cts.	1,582 50				
			2,000 00		
Iron fittings			825 74		
Lumber			664 40		
Repairs to boilers:					
Fairmount	$92 48				
Spring Garden	2,976 33				
Belmont	256 80				
Roxborough	112 70				
Chestnut Hill	211 41				
			3,649 72		
Repairs to engines:					
Fairmount	$190 00				
Spring Garden	260 79				
Frankford	39 95				
Kensington	94 50				
			585 24		
Repairs to pipe covering:					
Spring Garden	$342 41				
Belmont	139 29				
			481 70		
Shaft forgings			376 39		
Solution, Spring Garden	$650 00				
Belmont	425 00				
			1,075 00		
Stone			114 00		
Transportation			442 20		
Wages:					
Horse, cart and driver	$6 00				
Painters	643 50				
Stone masons	3,172 50				
Carpenters	3,261 00				
Laborers	$1,273 14				
Bricklayers	7,715 40				
Machinists	14,879 22				
			33,950 76		
Totals			$49,919 78	$80 22	
Item 4. Maintenance and repairs to buildings, grounds and reservoirs		$50,000 00			
Deficiencies of 1889:					
Bricks	$393 14				
Electric supplies	21 00				
Hauling ashes	43 20				
Repairs to wagon	15 25				
			472 89		
Bricks			1,117 64		
Brick pavements			582 00		
Brushes			33 55		
Bumper			87 97		
Carts; 3, at $84.00			252 00		
Chandlery			873 03		
Cleaning cesspool			38 00		
Door mats			13 50		
Electric plants, Roxborough and Frankford stations			1,975 00		
Electric supplies			1,185 71		
Forage			940 90		
Grade Stakes			5 90		
Gum goods			855 42		
Hardware			1,649 91		

Detailed Expenditures of the Bureau for 1890.

General Appropriations.		Amount appropria'd	Amount expended.	Amount merging.	Amount not merg'g
Item 4, continued.					
Harness			$82 14		
Hauling			480 00		
Hauling ashes, 2795.10 tons, at 23¾ cts.			663 37		
Horses, 4, at $220			880 00		
Horse blankets			29 25		
Horses, carts and drivers			503 00		
Horse shoeing			126 81		
Ice			343 94		
Iron fittings			938 04		
Lighter			1,000 00		
Lime			79 56		
Lumber			2,407 72		
Linseed oil			59 13		
Paints			1,256 71		
Paper hanging			35 00		
Plants			155 75		
Repairs to carts	$10 00				
Repairs to electric plants	143 50				
Repairs to harness	36 55				
Repairs to meters	226 35				
Repairs to roofs	1507 85				
Repairs to siding	72 96				
Repairs to wagons	58 55				
			2,055 76		
Sand			234 25		
Stone			316 04		
Tin			540 00		
Tin-roofing			532 95		
Tolls			106 65		
Towing			180 00		
Window shades			25 65		
Wages:					
Bricklayers	$37 75				
Watchmen	161 50				
Stone masons	165 00				
Horses, carts and drivers	198 00				
Helpers	3062 07				
Painters	3934 50				
Carpenters	4966 50				
Laborers	14,031 88				
			26,557 20		
Totals			$49,672 34	$327 66	
Item 5.—For repairs and improvement of the distribution, including the purchase of material and cost of labor in connection therewith, and expenses incident thereto	$85,000 00				
Transferred to					
From Item 1	$500 00				
From Item 2	1000 00				
From Item 6	1000 00				
From Item 10	204 09				
Other Bureaus	2295 91				
	5000 00				
Net appropriation to Item		$90,000 00			
Deficiencies 1889:					
Plumbing	$7 41				
Measuring over pipe	109 17				
			116 58		

Detailed Expenditures of the Bureau for 1890.

General Appropriations.		Amount appropria'd	Amount expended.	Amount merging.	Amount not merg'g
Item 5, continued.					
Brass castings			$1,073 62		
Carts, 3 @ $84 00			252 00		
Chandlery			482 00		
Corporation cocks 1458½in. @ $60 00			874 80		
Flag stone			21 00		
Forage			736 90		
Freight			5 50		
Gum goods			439 34		
Hardware			432 21		
Hauling			96 00		
Harness			82 14		
Horses, 6, at $220			1,320 00		
Horse sandals			12 50		
Horse shoeing			6 00		
Incidentals, metor inspector			87 35		
Iron fittings			995 71		
Iron Pipe:					
206—10-inch, 136,018 lbs, at $1.29	$1,754 63				
179—12-inch, 162,851 lbs., at $1.29	2,100 78				
1,141—6-inch, 419,090 lbs., at $1.27	5,322 43				
1,382—6-inch, 545,796 lbs., at $1.31	7,149 92				
			16,327 76		
Iron specials, 55,643 lbs., at $2.36	$1,313 15				
Specials, 274,861 lbs., at $2.31	6,349 30				
			7,662 45		
Lumber			983 36		
Plumbing			8 24		
Repairs to wagons			2 25		
Stone			581 29		
Towing			328 50		
Traveling expenses, pipe inspectors			74 65		
Wagons			783 00		
Wages:					
Improvement	$6.585 00				
First District	5,753 24				
Second District	6,753 77				
Third District	8,989 65				
Fourth District	15,590 17				
Fifth District	4,399 25				
Sixth District	8,086 11				
			56,167 19		
Totals			$89,952 34	$47 66	
Item 6. For supplies including fuel and labor, at the City construction and repair shops	$75,000 00				
Transferred to item	1,000 00				
Net appropriation to item		$7,400 00			
Bar iron and steel			2,180 85		
Boring Machine			4,020 00		
Brass castings:					
20,563¼ lbs. yellow, at 11½ cts.	$2,303 10				

Detailed Expenditures of the Bureau for 1890.

General Appropriations.			Amount appropria'd	Amount expended.	Amount merging.	Amount not merg'g
Item 6, continued.						
21,367 lbs. red, at 13⅜ cts.....	2,905 90					
				$5,209 00		
Brass fittings				8 00		
Chandlery				491 51		
Coal, 15 tons nut, at $4 92				73 80		
Copper ingot, 24½ lbs. at 15 cts.				3 68		
Expansion metal, 5,320 lbs. at 24 cts.		$1,276 80				
CR.						
2,950 lbs. brass scrap, at 9 cts.	$265 50					
6,500 lbs. brass turnings, at 8 cts.	520 00	785 50				
				491 30		
Gum goods				515 32		
" valves, 465 at.	$5 00	$2,325 00				
300 at.	2 25	675 00				
				3,000 00		
Hardware				2,630 86		
Incidentals				19 12		
Lead coating, 8,754 lbs at 4 cts.				350 16		
Leather belting				78 18		
Lime				10 69		
Listing				24 75		
Lumber				1,355 13		
Machine work				67 75		
Milling machine				1,550 00		
Portable drill				158 00		
Repairs to lathe				8 75		
Shop castings:						
139 lbs. at 1⅝ cts.		$2 58				
9,535 " 1⅞ "		171 63				
101,963 " 2¼ "		2,294 19				
145,096 " 1 13/16 "		2,307 02				
242,892 " 2⅛ "		5,100 73				
522,589½ " 2½ "		13,064 79				
				22,940 94		
Wages				28,738 05		
Totals				$73,925 84		$74 16
Item 7, for general incidental and contingent expenses, including keep of horse for Chief of Bureau, General Superintendent, and Assistant to Chief, each four hundred (400) dollars.		$14,000 00				
Transferred to from other Bureaus		700 00				
Net appropriation to item			$14,700 00			
Advertising				270 15		
Chairs and desks				101 00		
Carriage hire, (water committee visits of inspection)				248 50		
Dinners, (water committee upon visits of inspection)				806 00		
Frames				16 00		
Ground rent, 918 Cherry street				26 66		
Incidentals				166 97		

Detailed Expenditures of the Bureau for 1890.

General Appropriations.		Amount appropria'd	Amount expended.	Amount merging.	Amount not merg'g
Item 7, continued.					
Incidentals, hydrographic			$170 65		
Keep of horses, chief, general superintendent and assistant			1,200 60		
Lamps			48 00		
Maps			102 00		
Paper hanging			20 75		
Plants			35 00		
Professional services, V. S.			25 50		
Repairs to harness			16 40		
Rent of shop, Fifth District			100 00		
Serving daily papers			30 20		
Services extra type writer			30 00		
Stationery, Printing, &c			6,029 52		
Subscription			4 50		
Telephone rental			1,265 00		
Towels			42 00		
Transportation			57 00		
Traveling expenses, pipe clerk			32 75		
Type writer			65 00		
Type writer supplies			7 50		
Washing Towels			84 00		
Writing duplicates			1,182 71		
Wages contingent	$924 00				
Wages hydrographic	1,560 00				
			2,484 00		
Totals			$14,667 76	$32 24	
Item 8. For the purchase of material and cost of labor in connection with the laying of service pipe and expenses incident thereto	$100,000 00				
Transferred to from Item 1.	$1,000 00				
From Item 2...	5,000 00				
From other bureaus	14,000 00	20,000 00			
Net appropriation to Item		$120,000 00			
Brass fittings			1,591 24		
Brushes			3 93		
Chandlery			789 67		
Carts, 2 @ $84 00			168 00		
Copper boiler			12 00		
Corporation cocks:					
200, 1-in., at $1.15	$230 00				
400, ¾-in., at .80	320 00				
500, ⅝-in., at .66	330 00				
7542, ½-in., at .60	4525 20				
			5,405 20		
Freight			23 60		
Forage			623 88		
Gum goods			881 93		
Hardware			2,046 06		
Harness			452 95		
Hauling pipe			484 28		
Hoists			125 00		
Horses, 6, at $220.00			1,320 00		
Horses' medicine			12 00		
Horses' shoeing			138 50		

Detailed Expenditures of the Bureau for 1890.

General Appropriations.		Amount appropria'd	Amount expended.	Amount merging.	Amount not merg'g
Item 8, continued.					
Iron pipe:					
100, 4-in., 21,850 lbs, at $1.36	$297 16				
3865, 6-in., 1,417,405 lbs, at 1.27	18,001 00				
3544, 6-in., 1,302,055 lbs, at 1.31	17,056 95				
100, 8-in., 49,021 lbs, at 1.29	632 37				
94, 10-in., 53,332 lbs, at 1.29	809 31				
721, 12-in., 658,313 lbs, at 1.29	8,492 29				
Iron specials:					
284.054 lbs, at $2.31	6,561 66				
86,792 lbs, at 2.36	2,048 29				
Extra work:					
128½ hours at .60	77 10				
			$53,976 13		
Lumber			2,350 80		
Measuring over pipe			1,515 19		
Professional services, V. S			62 00		
Powder and dynamite			275 40		
Rent of shop, 5th District			25 00		
Repairs to harness	$112 90				
Repairs to pavement	3 75				
Repairs to tools	22 12				
Repairs to toolhouse	46 50				
Repairs to wagons	15 50				
			200 77		
Spars			49 00		
Stop-valves, 28, 6-in., 3 way at $28.50			855 00		
Travelling expenses, pipe inspectors			138 30		
Wagons			783 00		
Water Meters:					
2—4-in. at $302 00	$604 00				
4—3-in. at 151 50	606 00				
			1,210 00		
Wharfage			48 75		
Wages, First District	$5,282 81				
Second "	10,719 49				
Third "	7,306 18				
Fourth "	7,618 37				
Fifth "	3,278 31				
Sixth "	7,736 66				
Improvement	2,468 50				
			44,410 32		
Totals			$119,977 90		$22 10
Item 9, Extensions	$200,000 00				
Balance from books of 1889	8,850 67				
Net appropriation to item		$208,859 67			
Asphalt walks			2,807 50		
Batteaux, 6 at $48 00			288 00		
Chandlery			437 08		
Clay			22 00		
Curbing granite:					
2,519¼ feet straight, at $1.76	$4,434 75				

Detailed Expenditures of the Bureau for 1890.

General Appropriations.		Amount appropria'd	Amount expended.	Amount merging.	Amount not merg'g
Item 9, continued.					
733¾ feet circular, at $2.31	1,694 18				
		.....	$6,128 98		
Excavating pipe trench:					
4,363 cubic yards, at 35 cts.	$1,527 05				
1,102 " at 37 cts.	407 74				
		.....	1,934 79		
7,120 cubic yards, at 68 cts.	$4,841 60				
701 " at 80 cts.	560 80				
	$5,402 40				
Less 20 per cent. not paid,	1,080 48				
		.....	4,321 92		
Freight		.....	18 36		
Gum goods		.....	96 33		
Hauling		.....	994 50		
Hoisting engine		.....	1,230 00		
Horses, carts and drivers		.....	933 00		
Iron pipe:					
383—6-in. 212,892 lbs. at $1.31	$2,788 89				
50—16-in. 66,857 lbs. at $1.30	869 14				
50—20-in. 85,518 lbs. at $1.30	1,111 73				
200—48-in. 1,476,594 lbs. at $1.33	19,638 71				
800—48-in. 5,962,033 lbs. at $1.29	76,910 23				
		.....	101,318 70		
Iron specials:					
10,863 lbs. at 2½ cts.	$271 58				
10,545 " " 2 35/100 "	248 86				
17,692 " " 2 21/100 "	408 68				
38,646 " " 4¼ "	1,642 47				
128¼ hours extra work at 60 cts.	76 95				
		.....	2,648 54		
Lead, 314,009 lbs. at 4 14/100 cts.		.....	12,999 96		
Lumber		.....	4,497 75		
New boilers		.....	8,859 67		
Overflow basin		.....	1,809 00		
Powder and dynamite		.....	167 00		
Repairs to instruments		.....	54 65		
" " meters		.....	40 50		
Services of diver		.....	350 00		
Stone		.....	835 96		
Tolls		.....	170 15		
Towing		.....	760 00		
Travelling expenses, pipe inspectors		.....	519 68		
Use of lighter		.....	245 00		
Water meters:					
12, 2-in., at $76.00	$912 00				
14, 3-in., at 151.50	2121 00				
20, 4-in., at 302.00	6040 00				
1, 6-in.	604 00				
		.....	9,677 00		
20, 2-in., at $49.50	$990 00				
20, 3-in., at 99.00	1980 00				
30, 4-in., at 198.00	5940 00				
2, 6-in., at 450 00	900 00				
		.....	9,810 00		

Detailed Expenditures of the Bureau for 1890.

General Appropriations.		Amount appropria'd	Amount expended.	Amount merging.	Amount not merg'g
Item 9, continued.					
Wages:					
Pipe inspectors	$348 00				
Third district	6,541 62				
Fourth district	14,761 04				
Fifth district	2,539 31				
Sixth district	1,722 78				
Buildings, grounds and reservoirs	6,500 58				
		.....	$32,403 33		
Totals		.....	$206,379 30	$1,399 89	$1,080 48
Item 9½—For a new reservoir at Roxborough, ordinance June 9th 1890		$400,000 00			
Incidentals		.....	3 66		
Iron pipe:					
1429, 6-in., 521,712 lbs. at $1\frac{33}{100}$ cts.	$6834 43				
100, 12-in., 93,084 lbs. at $1\frac{24}{100}$ cts.	1163 55				
75, 36-in., 345,745 lbs. at $1\frac{23}{100}$ cts.	4252 66	.....	12,250 64		
Iron specials:					
8585 lbs. at $2\frac{31}{100}$ cts.	$82 82				
31,969 lbs. at $2\frac{35}{100}$ cts.	754 47				
36,547 lbs. at 2½ cts.	913 68				
26,105 lbs. at $3\frac{8}{10}$ cts.	992 01				
181 hours extra work at 60cts.	108 60				
		.....	2,851 58		
Lead, 99,996 lbs. at 6¼ cts.		.....	6,249 76		
Rent of room		.....	40 00		
Travelling expenses, pipe inspectors		.....	163 09		
Wages:					
Fifth District	$630 75				
Reservoir roll	3382 70				
		.....	4,013 45		
Totals		.....	$25,572 18	$23,427 82	$351,000 00
Item 9—Appropriation for 1889, for a 48-in. main, from East Park to Lehigh Basin.					
Balance Jan. 1st, 1890	$49,119 53				
Transferred to Item 5	204 09				
Net appropriation to Item		48,915 44			
Excavating Pipe Trench:					
Rock, 29 cubic yards, at $1.05	$30 45				
Rock, 19 cubic yards, at $1.25	23 75				
Earth, 12,228½ cubic yards at 70 cts.	8,559 95				
Earth, 2,539 cubic yards, at 90 cts.	2,285 10				
Shoring lumber	9 89				
		.....	10,909 14		
Iron Pipe:					
400, 48-in., 300,000 lbs., at $1\frac{16}{100}$ cts.		.....	34,800 00		

Detailed Expenditures of the Bureau for 1890.

General Appropriations.		Amount appropria'd	Amount expended.	Amount merging.	Amount not mergi'g
Item 9, continued.					
Iron Specials:					
5,860 lbs., at $3\frac{46}{100}$ cts.....	$210 96				
123,001 lbs., at $2\frac{2}{10}$ cts.....	2,706 02				
171 hours extra work, at 60 cts..	102 60				
		.....	$3,019 58		
Retained percentage for specials delivered 1889.....		.....	186 72		
			$48,915 44		

RECAPITULATION.

Balance from books of 1889.....	$57,979 20			
Transferred from other Bureaus.....	16,995 91			
Special appropriation.....	400,000 00			
		$474,975 11		
Annual appropriation.....	.....	896,053 00		
			$1,371,028 11	
Expended for maintenance.....	712,497 37			
Expended for extension.....	280,866 92			
		993,364 29		
Amount merging.....	25,583 34			
Amount not merging.....	352,080 48	377,663 82		
			1,371,028 11	

APPENDIX C.

REPORT

OF THE

GENERAL SUPERINTENDENT

OF

WORK DONE DURING 1890 TO BUILDINGS, GROUNDS AND RESERVOIRS, AND BOILERS AND MACHINERY OF THE SEVERAL PUMPING STATIONS.

OFFICE OF THE GENERAL SUPERINTENDENT.

BUREAU OF WATER.

January 13, 1890.

JOHN L. OGDEN,

Chief.

SIR:—The following is a report of the work performed under my direction for the year 1890:

There have been pumped 51,698,508,699 gallons of water; an increase of 9,179,588,918 gallons over the pumpage of the year 1889.

The maximum daily pumpage was 170,600,577 gallons; an increase of 21,634,233 gallons over the maximum daily pumpage of the preceding year.

The average daily pumpage was 141,639,749 gallons; an increase of 25,149,558 gallons over the average of 1889.

There have been pumped from East Park Reservoir to the district supplied by direct pumpage 988,997,176 gallons of water during the year. This method is always resorted to after heavy rains when the water in the river becomes muddy.

The machinery and boilers at the several stations have been kept in good working order.

The engines at most of the works have been run to their full capacity; particularly is this the case at the Spring Garden Station, where the theoretical capacity was exceeded daily during the months of July, August, September and October.

During the early part of the year the No. 3 engine was taken out at the Kensington Works and the place abandoned as a pumping station. The engine was erected at the old Spring Garden Station on foundations prepared for it, and connected to No 6 pumping main; it was started up June 27 to pump to the East Park Reservoir.

No 6 engine at the Spring Garden Works is now undergoing extensive repairs, and will be ready for use early next year.

On October 17 the high pressure piston of No. 2 engine at Roxborough broke. As this engine could not be dispensed with for any length of time the piston of No. 3 engine at Belmont was substituted and a new piston made for the Belmont engine.

A new glass suspension step was put on the upright shaft of No. 3 turbine at Fairmount and is working quite satisfactorily.

The Roxborough and Frankford Stations have each been supplied with electric plants of the Edison System of dynamo and Armington & Sims' engine. The engines were put in place and wires run by this bureau. Seventy-five lights were put in at each station.

During the summer when the river was low the dam at Fairmount was thoroughly repaired and is now in good condition.

The building and grounds belonging to this Bureau have been kept in good condition and many improvements have been made.

The reservoirs have all been kept in good repair. New fences were put around the Roxborough and Mt. Airy Basins.

At East Park Reservoir an overflow basin was built at the intersection of the three basins.

Inclines have been graded and granite curbs set at Thirty-third and Diamond streets, and the Columbia avenue side of the bank; also a new incline and curb at north side of Lehigh basin.

Boats have been placed in each section of the several reservoirs and fitted with oars and are kept ready for immediate use.

On August 16 the water in the Flat Rock pool was lowered to repair the dam. It was drawn so low that the pumping was stopped from 4 P. M. until midnight, when the pumps were again started. During the time the pumps were stopped the pump wells were cleaned out.

A new coal shed was built at Mount Airy.

Watch houses at East Park Reservoir and stables and wagon sheds at the First, Second and Fourth Purveyor's District yards were built.

A lighter was bought in the early part of the year for the purpose of carrying stone from the House of Correction to the dam at Fairmount, and for foundations under pumping mains at Spring Garden Station.

On July 28 work was begun on a new reservoir at Roxborough. Soundings were taken to determine approximately the character of the excavations and holes were sunk, 200 feet apart, to the bottom of the excavations. This was done by augers as far as practicable; in other cases shafts were dug.

On August 13 a topographical survey of the property was begun which was made as carefully and completely as possible.

Bids for the work were opened on November 7 and the contract subsequently awarded, and on December 1 the contractor began operations.

I take pleasure in stating that the employés of the several stations are well disciplined, capable and attentive to their duties.

Respectfully submitted,

F. L. HAND.

Journal Turbines—Double-acting horizontal plunger pumps.
Total Capacity—33,290,000 gallons per day.

FAIRMOUNT PUMPING STATION.

Capacity No. 1—2,000,000 gallons per day.
Capacity Nos. 3, 4 and 5—5,330,000 gallons per day.
Capacity Nos 7, 8 and 9—5,100,000 gallons per day.

1890.	Running Time of Each Turbine in Hours.							Gallons Pumped by Each Turbine.							Total Gallons Pumped Each Month.	Average Pumpage per Day.	Oil.	
																	Castor	Engine
	No.1	No.3	No.4	No. 5	No.7	No.8	No.9	No. 1.	No. 3.	No. 4.	No. 5.	No. 7.	No. 8.	No. 9.			Quarts	Quarts.
January...	744	737	700	692½	685½	692½	692½	79,290,112	207,737,203	197,625,629	183,416,226	158,880,800	161,506,150	161,884,125	1,150,340,245	37,107,749	15	227
February..	661	663	670	657	515	656	653	69,253,888	186,352,796	187,136,496	173,800,688	120,006,900	156,278,850	154,491,675	1,047,321,293	37,404,331	18	169
March.....	738	724	739	680	684½	616½	670½	75,727,872	204,071,331	207,483,653	182,361,919	161,138,900	144,588,275	157,804,725	1,133,176,675	36,554,086	15	189
April.....	712	720	698	720	718	685	701	71,622,272	200,035,737	194,535,546	187,591,964	165,387,625	155,261,600	160,815,850	1,135,250,594	37,841,686	35	208
May.....	725	735	738	740	741	737	740	68,798,720	204,086,544	204,266,334	196,749,729	167,865,750	167,830,325	167,820,575	1,177,417,977	37,981,225	32	219
June	718	718	700	716	682	650	590	73,424,768	197,508,074	193,558,687	180,897,783	153,810,475	148,598,125	132,782,325	1,080,580,237	36,019,341	22	209
July.....	668	342	681	647	480	590	430	69,684,864	89,461,199	186,609,573	167,830,277	109,350,475	138,699,275	101,556,975	863,192,638	27,844,923	24	206
August...	736	.....	733	664	481	457	438	75,379,456	.....	199,298,137	167,654,636	113,682,725	103,951,900	101,408,775	761,375,629	24,560,504	22	175
September	628	692	711	663	537	545	241	62,537,984	183,509,348	194,456,715	164,431,785	124,657,325	127,956,075	57,170,235	914,719,467	30,490,648	24	188
October....	729	724	724	717	668	679	368	72,783,360	199,139,553	195,135,768	175,626,709	153,281,700	158,171,975	82,130,100	1,036,269,165	33,428.037	18	206
November	719	716	715	705	663	664	666	69,162,240	194,086,071	190,913,008	174,386,619	154,622,000	155,979,525	154,167,975	1,093,317,438	36,443,914	21	203
December	738	744	743	701	440	437	426	70,008,064	203,436,534	199,723,640	176,064,659	108,716,725	107,257,475	104,818,675	970,025,772	31,291,153	12	185
Total.....	8,516	7,515	8,552	8,302½	7,295	7,409	6,616	857,673,600	2,069,424,390	2,350,743,186	2,130,812,994	1,691,401,400	1,726,079,550	1,536,852,010	12,362,987 130	33,871,197	258	2,384

Total Capacity—30,000,000 Gallons per day.

NEW SPRING GARDEN STATION.

No. 9.—Worthington Duplex.—Capacity, 15,000,000 gallons per day.
No.10.—Worthington Duplex.—Capacity, 15,000,000 gallons per day.

1890.	Running Time of Each Engine in Hours.		Gallons Pumped by each Engine.		Total Pumpage of each Month.	Average Pumpage per Day.	Coal.		Percentage of Ashes.	Oil.		Mean Water Press're and Mean Suction Lift in pounds per sq. in.		
										Cylinder.	Engine.			
	No. 9.	No. 10.	No. 9.	No. 10.	Gallons.	Gallons.	Tons.	Lbs.		Qts.	Qts.	No. 9.	No. 10	
Jannary	742½	740¼	400.104,909	408,867,288	808,972,197	26,095,877	1,486	1,523	.20	500	65	78	78	387.4
February	656½	664½	363,160,620	363,171,552	726,332,173	25,940,434	1,271	210	.20	460	56	73	78	406.8
March	303¾	383	187,382,369	222,655,591	410,037,960	13,227,030	715	1,725	.20	290	45	72	76	407.9
April	718½	653	447,631,501	434,531,244	882,162,745	29,372,091	1,327	2,113	.20	501	59½	73	58	473.0
May	737	736½	446,168,161	446,489,423	892,657,584	28,795,405	1,376	467	.20	521	64	69	69	461.2
June	719	716½	425,563,661	422,036,661	847,600,322	28,253,344	1,436	1,602	.20	523	80	77	77	420.0
July	742¾	743	438,352,181	439,163,472	877,515,653	28,306,956	1,560	1,460	.20	558	85	77	77	400.3
August	743¾	743¼	479,055,023	482,607,850	961,662,873	31,021,383	1,663	2,033	.20	587	75	74	74	411.5
September	719½	718½	466,617,917	467,818,024	934,435,941	31,147,864	1,595	1,338	.20	656	74	75	75	417.0
October	739¼	740¾	457,784,894	458,421,231	916,206,125	29,555,036	1,666	15	.20	620	62	73	73	391.5
November	719¼	720	448,414,120	439,573,880	887,988,000	29,599,600	1,643	1,451	.20	585	76	75	75	384.6
December	738	743½	440,129,771	442,925,429	883,055,210	28,485,651	1,627	2,178	.20	595	63	76	76	386.2
Totals and aver'es.	8,279¾	8,302¾	5,000,365,187	5,028,261,646	10,028,626,783	27,475,089	17,372	435	.20	6,396	754¼	74	74	354.1

No. 6.—Simpson Rotary Compound, 10,000,000 gallons per day.
No. 7.—Marine Rotary Compound, 20,000,000 gallons per day.
No. 8.—Worthington Duplex, 10,000,000 gallons per pay.
No. 11.—Gaskill Compound, 20,000,000 gallons per day.
No. 12.—Worthington Duplex, 6,000,000 gallons per day.

Coal.		Percentage of Ashes.	Oil.		Mean Water Pressure and Mean Suction Lift in lbs., per sq. inch.					Gallons raised 100 ft. per pound of Coal.
			Cylinder.	Engine.						
Tons.	Lbs.		Qts.	Qts.	No. 6.	No. 7.	No. 8.	No. 11.	No. 12.	
1,362	2,159	.20	506	257	47	73	54	51	.....	434.1
1,188	866	.20	497	323	47	63	60	68	.....	542.0
1,595	1,156	.20	566	303	.....	54	74	77	.....	534.1
1,710	1,877	.20	519	240	.....	53	77	77	.....	477.4
1,360	339	.20	516	271	.....	53	69	63	.....	633.8
1,972	1,070	.20	784	391	51	54	63	54	55	606.6
2,508	1,402	.20	1,122	494	51	54	62	50	58	584.4
2,513	1,973	.20	1,111	494	51	54	55	50	60	578.2
2,390	1,622	.20	1,069	474	51	54	55	50	60	580.8
2,167	441	.20	963	386	51	54	56	50	58	589.5
1,998	1,094	.20	846	341	.....	54	55	50	57	576.9
1,982	488	.20	894	376	.....	54	55	50	57	563.3
22,751	1,047	.20	9,333	4,350	49	56	61	57	58	563.2

No. 9.—Worthington Duplex.—
Capacity, 15,000,000 gallons

Total Capacity—18,000,000 gallons per day.

BELMONT PUMPING STATION.

No. 1.—Worthington Duplex.—Capacity, 5,000,000 gallons per day.
No. 2.—Worthington Duplex.—Capacity, 5,000,000 gallons per day.
No. 3.—Worthington Duplex.—Capacity, 8,000,000 gallons per day.

1890.	Running Time of each Engine in Hours.			Gallons Pumped by each Engine.			Total Pumpage of each Month.	Average Pumpage per Day.	Coal.		Percentage of Ashes.	Oil.		Mean Water Pressure and Mean Suction Lift in pounds per sq. in.			Gallons raised 100 feet per pound of coal.
												Cylinder.	Engine.				
	No. 1.	No. 2.	No. 3.	No. 1.	No. 2.	No. 3.	Gallons.	Gallons.	Tons.	Lb.		Qts.	Qts.	No. 1.	No. 2.	No. 3.	
January	68	412½	635	15,625,500	95,507,880	235,950,075	347,083,455	11,196,210	838	2,123	.20	97½	27¼	88	8	88	399.3
February	21	417½	564	5,029,500	96,835,128	206,152,160	308,016,788	11,000,599	815	470	.20	90¼	26	88	88	88	364.6
March	225	460½	423	53,251,800	106,222,584	160,990,415	320,464,799	10,337,574	799	1,266	.20	95¼	25¼	88	88	88	386.8
April	255	431½	539½	62,191,500	107,937,336	217,575,365	387,704,201	12,923,473	972	1,170	.20	109	28	88	88	88	384.8
May	722	730	21	180,738,600	189,910,344	8,173,705	378,822,649	12,220,085	839	410	.20	119¼	35½	88	88	88	435.6
June	218	600½	542¼	53,797,800	151,109,400	201,545,145	406,452,345	13,548,411	819	1,645	.20	119½	35¼	88	88	88	478.5
July	115½	744	623	29,973,600	183,275,976	231,717,965	444,967,541	14,353,791	866	903	.20	140	38	88	88	88	495.6
August	.....	712	742	.....	171,863,016	272,012,250	443,875,266	14,318,556	885	80	.20	135¼	36¼	88	88	88	484.2
September	113	612	603	28,423,450	172,126,032	224,056,420	424,605,902	14,153,530	846	2,058	.20	127½	37½	88	88	88	483.8
October	179	732	421	83,108,100	174,685,992	150,282,100	408,076,192	13,163,748	876	510	.20	131½	38¼	88	88	88	449.5
November	695	679	65	181,609,800	184,952,352	24,983,320	391,545,472	13,051,515	951	1,053	.20	136¼	36¾	88	88	88	397.1
December	684	612½	119½	175,662,000	161,356,296	49,577,185	389,595,481	12,567,596	967	1,505	.20	112	37½	88	88	88	388.5
Totals and averages	3,295½	7,144	5,298¼	869,411,650	1,798,782,336	1,983,016,105	4,651,210,091	12,743,041	10,478	1,943	.20	1,413¼	401½	88	88	88	428.4

Total Capacity, 14,750,000 gallons per day.

ROXBOROUGH PUMPING STATION.

No. 1.—Cornish Overhead Beam.—Capacity, 2,250,000 galls. per day.
No. 2.—Worthington Duplex.—Capacity, 5,000,000 galls. per day.
No. 3.—Worthington Duplex.—Capacity, 7,500,000 galls. per day.

1890.	Running time of each Engine in Hours.		Gallons pumped by each Engine.		Total Pumpage of each Month.	Average Pumpage per day.	Coal.		Percentage of Ashes.	Oil.		Mean Water Pressure and Mean Suction Lift in lbs. per Square inch		Gallons raised 100 feet per pound of Coal.
										Cylinder.	Engine.			
	No. 2.	No. 3.	No. 2.	No. 3.	Gallons.	Gallons.	Tons.	Lbs.		Qts.	Qts.	No. 2.	No. 3.	
January	241	499	62,828,225	152,862,662	215,690,887	6,957,770	914	85	.24	188	64½	145	142	389.3
February	424½	258	110,869,850	79,471,782	190,341,632	6,797,915	783	1,399	.24	190	64	145	142	400.7
March	61	698½	15,766,275	218,641,314	234,407,589	7,561,535	877	486	.25	193	66	145	142	440.9
April	278	471	72,291,520	145,202,601	217,494,121	7,249,804	808	1,027	.25	197	80½	145	142	443.8
May	75	679	18,936,935	207,851,367	226,788,302	7,315,751	820	2,118	.24	202	68	145	142	455.8
June	112	711	24,932,220	222,847,899	247,780,119	8,259,337	878	863	.25	195	75	145	142	465.4
July	106½	744	25,429,060	240,377,946	265,807,006	8,574,419	940	1,012	.25	241½	92	145	142	418.8
August	195	732½	47,491,665	237,156,775	284,648,440	9,182,207	1,022	503	.25	265½	121	145	142	459.4
September	175	711	41,692,580	239,719,723	281,412,303	9,380,410	1,062	1,119	.25	247	103	145	142	436.5
October	123	737½	29,417,105	245,385,495	274,802,600	8,864,600	1,036	1,315	.25	232	108	145	142	437.4
November	102	718	23,777,315	234,054,205	257,831,520	8,594,384	990	853	.25	228	98	145	142	429.5
December	99½	724	22,479,295	233,166,465	255,645,760	8,246,637	1,014	2,108	.25	233	101	145	142	415.6
Totals and averages.	1,992½	7,684	495,912,045	2,456,738,234	2,952,650,279	8,089,452	11,149	1,688	.25	2,612	1,041	145	142	436.9

Total Capacity.—785,000 Gallons per day.

ROXBOROUGH AUXILIARY STATION.

No. 1.—Knowles.—Capacity, 500,000 Gallons per day.
No. 2.—Knowles.—Capacity, 285,000 Gallons per dey.

1890.	Running Time of each Engine in Hours.		Gallons Pumped by each Engine.		Total Pumpage of each Month.	Average Pumpage per day.	Coal.		Percentage of Ashes.	Oil. / Cylinder.	Mean Water Pressure.	
	No. 2.	No. 3.	No. 2.	No. 3.	Gallons.	Gallons.	Tons.	Lbs.		Qts.	No. 1.	No. 2.
January	34	71	867,800	843,095	1,710,895	55,190	6	1,247	.20	4	37	37
February	33	59½	844,700	707,850	1,552,550	55,448	6	546	.20	3½	37	37
March	39	66½	1,000,900	790,515	1,791,415	57,787	7	692	.20	4	36	36
April	36	64	914,300	760,045	1,674,345	55,811	5	794	.20	4	36	36
May	36	82	924,100	961,136	1,885,236	60,814	5	1,558	.20	4	37	37
June	42	62	1,089,000	738,474	1,827,474	60,915	4	1,651	.20	3¾	36	36
July	40	73	1,030,300	871,563	1,901,863	61,350	4	1,941	.20	4	37	37
August	18	82	160,000	917,224	1,077,224	34,749	5	182	.20	4	37	37
September	22	65	291,000	643,500	934,500	31,150	5	603	.20	3¾	36	36
October	15	50	180,000	495,000	675,000	21,774	6	692	.20	3¾	37	37
November	16	39	192,000	386,430	578,430	19,281	6	1,616	.20	3¾	36	36
December	15	43½	180,650	404,712	585,362	18,882	8	1,735	.20	4	36	36
Totals and averages	346	757½	7,674,750	8,519,544	16,194,294	44,367	72	2,057	.20	46½	37	37

Total Capacity—2,000,000 gallons per day.

MOUNT AIRY PUMPING STATION.

No. 1.—Davidson's Rotary.—Capacity, 1.000,000 gallons per day.
No. 2.—Davidson's Rotary.—Capacity, 1,000,000 gallons per day.

1890.	Running time of each Engine in Hours.		Gallons Pumped by each Engine.		Total Pumpage of each Month.	Average Pumpage per Day.	Coal.		Percentage of Ashes.	Oil.		Mean Water Pressure and Mean Suction Lift in lbs. per sq. inch.		Gallons raised 100 feet per pound of coal.
										Cylinder.	Engine.			
	No. 1.	No. 2.	No. 1.	No. 2.	Gallons.	Gallons.	Tons.	Lbs.		Qts.	Qts.	No. 1.	No. 2.	
January	744	.....	27,105,750	.....	27,105,750	874,379	58	1,836	.19	31	31	57	.....	275.6
February	612	60	21,813,750	2,135,000	23,948,750	855,312	52	1,280	.20	39	29	60	60	270.0
March	264	480	9,472,500	17,057,500	26,530,000	855,806	59	636	.20	31	32½	57	60	266.5
April	720	.....	26,476,250	.....	26,476,250	882,541	58	1,123	.20	33	30	57	.....	277.1
May	744	106	27,433,750	3,466,250	30,900,000	996,774	67	1,220	.20	44	43	58	58	272.4
June	720	390½	28,935,450	12,899,550	41,835,000	1,394,500	89	345	.20	74½	77½	60	70	279.4
July	731	369	31,307,500	12,002,500	43,310,000	1,397,096	94	785	.20	72	72	60	70	273.3
August	744	378	30,497,150	11,806,600	42,303,750	1,364,637	92	1,240	.20	62	61	60	70	272.2
September	716	417	29,865,400	13,740,851	43,606,251	1,453,541	104	1,190	.23	62	65	60	70	248.4
October	726	328	29,000,000	10,183,750	39,183,750	1,263,991	94	1,840	.23	61	60	60	70	241.3
November	716	330	28,248,750	9,756,250	38,005,000	1,266,833	87	595	.20	54½	59	60	70	259.3
December	741	344	26,317,500	9,898,750	36,216,250	1,168,266	87	2,020	.20	57	57	60	70	245.5
Totals and Averages	8,178	3,202½	316,473,750	102,947,001	419,420,751	1,149,097	947	670	.20	611	617	59	66	263.6

Total Capacity.—750,000 gallons per day.

CHESTNUT HILL PUMPING STATION.

No. 2.—Knowles.—Capacity, 250,000 gallons per day.
No. 3—Worthington Duplex.—Capacity, 500,000 gallons per day.

1890.	Running Time of each Engine in hours.		Gallons pumped by each Engine.		Total Pumpage of each Month.	Average Pumpage per day.	Coal.		Percentage of ashes.	Oil.		Mean Water Pressure and Mean Suction Lift in Pounds per Square Inch.		Gallons raised 100 feet per pound of coal.
										Cylinder.	Engine.			
	No. 2.	No. 3.	No. 2.	No. 3.	Gallons.	Gallons.	Tons.	Lbs.		Qts.	Qts.	No. 2.	No. 3.	
January	.....	558	.....	15,305,080	15,305,080	493,712	27	1872	.16	23	.....	.....	53	304.1
February	.....	504	.....	13,674,960	13,674,960	488,391	24	1788	.16	22	.....	.....	53	305.0
March	.....	558	.....	15,238,080	15,238,080	491,550	27	2220	.16	31	.....	.....	53	301.1
April	.....	541	.....	15,068,040	15,068,040	502,268	26	1369	.16	30	.....	.....	53	313.1
May	368	.....	11,424,240	.....	11,424,240	368,523	20	1671	.19	24¾	.....	53	.....	304.5
June	57	.....	1,810,560	.....	1,810,560	60,352	10	1822	.28	4½	.....	53	.....	92.0
July	166	.....	5,999,940	.....	5,999,940	193,546	14	440	.22	18	.....	53	.....	233.7
August	130	.....	4,917,540	.....	4,917,540	158,630	13	1161	.25	10	.....	53	.....	201.2
September	45	.....	1,616,220	.....	1,616,220	53,874	10	536	.25	4	.....	53	.....	87.3
October	104	.....	3,758,880	.....	3,758,880	121,254	13	607	.25	4½	.....	53	.....	156.6
November	4	.....	147,600	.....	147,600	4,920	9	1861	.38	¾	.....	53	.....	8.3
December	9	.....	309,960	.....	309,960	9,998	10	1581	.27	½	.....	53	.....	16.0
Totals and averages	883	2,161	29,984,940	59,286,060	89,271,100	244,578	210	1248	.22	173	.....	53	53	234.5

Total Capacity, 20,000,000 gallons per day.

FRANKFORD PUMPING STATION.

No. 1.—Marine Compound Rotary.—Capacity, 10,000,000 gals. per day.
No. 2.—Corliss Compound Rotary.—Capacity, 10,000,000 gals. per day.

1890.	Running Time of each Engine in Hours.		Gallons Pumped by each Engine.		Total Pumpage of each Month.	Average Pumpage per Day.	Coal.		Percentage of Ashes.	Oil.		Mean water Pressure and mean suction lift in pounds per square inch.		Gallons raised 100 ft. per pound of coal.
										Cylinder.	Engine.			
	No. 1.	No. 2.	No. 1.	No. 2.	Gallons.	Gallons.	Tons.	Lbs.		Qts.	Qts.	No. 1.	No. 2.	
January	733	.....	266,117,801	.....	266,117,801	8,584,445	348	480	.25	171	128	79	.....	621.6
February	256½	400½	99,325,596	138,174,333	237,499,929	8,482,140	284	840	.25	138	138	80	80	679.3
March	426½	252½	153,047 445	85,811,262	238,858,707	7,705,119	308	761	.25	157	149	78	81	630.1
April	393	301½	142,756,755	105,685,428	248,442,183	8,281,406	312	2,072	.25	156	177	78	79	645.7
May	513	182½	177,701,610	61,638,428	239,340,402	7,720,658	300	128	.25	117	175	76	78	648.8
June	252½	458¾	86,376,723	159,805,665	246,182,388	8,206,079	294	1,622	.25	119	179	76	78	677.9
July	737	.....	302,272,260	.....	302,272,260	9,750,718	437	211	.25	180	248	84	.....	562.5
August	443	308	190,997,430	108,395,942	299,393,372	9,657,850	409	1,218	.25	159	216	88	86	594.6
September	489	220½	207,741,833	79,942,652	287,684,485	9,589,482	417	840	.25	156½	215½	88	88	560.6
October	352½	384½	144,843,734	140,911,320	285,755,054	9,217,904	404	202	.25	156	217	88	87	550.8
November	473	244½	168,138,555	87,335,592	255,474,147	8,515,804	391	300	.25	155	217	85	79	531.2
December	553½	132	207,339,503	46,764,552	254,104 055	8,196,905	421	642	.25	147½	205½	81	81	490.6
Totals and averages	5,622½	2,888¼	2,146,659,245	1,014,465,598	3,161,124,783	8,660,615	4,329	356	.25	1,812	2,265	82	81	593.9

KENSINGTON PUMPING STATION.

No. 3.—Worthington Duplex.—Capacity, 6,000,000 gallons per day.

1890.	Running Time in Hours.	Gallons Pumped.	Average Pumpage per Day.	Coal.		Percentage of Ashes.	Oil.		Mean Water Pressure and Mean Suction Lift in lbs. per sq. inch.	Gallons raised 100 feet per pound of coal.
							Cylinder.	Engine.		
	No. 3.	No. 3.	Gallons.	Tons.	Lbs.		Qts.	Qts.		
January	69	20,636,742	20,636,742	56	2,233	.25	4	2	50	208.1
February				50	1,400	.20	7½	9		
March				49	688	.20	9	9		
April				34	1,140	.20	15½	15½		
May										
June										
July										
August										
September										
October										
November										
December										
Totals and averages	69	20,636,742	20,636,742	191	981	.21	36	35½	50	208.1

APPENDIX D.

REPORT

ON THE

OPERATIONS IN CONNECTION WITH THE

DISTRIBUTION SYSTEM

DURING 1890.

BUREAU OF WATER.

January 26, 1891.

JOHN. L. OGDEN,

Chief, Bureau of Water.

SIR:—I have the honor to report on the operations of the Distribution System as follows:

There have been laid one hundred and twenty-five thousand six hundred and eighty-three (125,683) feet of service mains, nineteen thousand eight hundred and eighty-one (19,881) feet of supply mains, and one thousand six hundred and ninety-eight (1698) feet of pumping mains, which, in addition to the connections and other new work, make a total of one hundred and fifty-nine thousand one hundred and seventy-six (159,176) feet or thirty (30) miles and seven hundred and seventy-six (776) feet added to the distribution system, and a total of nine hundred and fifty-nine (959) miles and two thousand eight hundred and thirteen (2813) feet now in use.

Thirty-three thousand two hundred and forty-two (33,242) feet of pipe have been used for relaying old and defective service mains, and for alterations.

The total quantity used for relays and repairs was thirty-nine thousand eight hundred and thirty-two (39,832) feet, and of that taken up, lowered, raised and shifted, thirty thousand seven hundred and fourteen (30,714) feet, making the total amount for repairs seventy thousand five hundred and forty-six (70,546) feet.

The total quantity of pipe handled for all purposes throughout the year was two hundred and twenty-nine thousand seven hundred and twenty-two (229,722) feet, weighing seventeen millions two hundred and twenty-two thousand five hundred and ninety-nine (17,222,599) pounds.

Abandoned Pipes.

Fourteen thousand five hundred and eighty-four (14,584) feet of pipe have been cut off from the distribution and abandoned, as follows:

3 inch	3,360 feet.
4 inch	8,763 feet.
6 inch	2,221 feet.
18 inch	192 feet.
20 inch	48 feet.

Fire Hydrants.

Six hundred and nineteen (619) new and three (3) old style fire hydrants have been put in in new locations. Two hundred and forty-three (243) new and twenty-five (25) old style have been substituted for defective ones of the old pattern, making a total of eight hundred and sixty-two (862) new and twenty-eight (28) old style hydrants put in during the year, and two hundred and eighty-nine (289) old and seventeen (17) new ones taken out. The total number in use December 31, 1890, was seven thousand seven hundred and forty-nine (7749) of which four thousand and ninety-three (4093) are of the old pattern, and three thousand six hundred and fifty-six (3656) of the new. The latter, equal to 47 per cent. of the total in use, were put in during the past six years.

Drills.

Ten thousand and eighty (10,080) new attachments were made as follows:

½ inch	9248	area of openings.....	1815 square inches.
⅝ inch	426	area of openings.....	131 square inches.
¾ inch	164	area of openings.....	73 square inches.
1 inch	167	area of openings.....	131 square inches.
1½ inches	30	area of openings.....	53 square inches.
2 inches	46	area of openings.....	145 square inches.
Total,	10,080		2348
Total, 1889	9,544		2172
Inc., 1890	536		176

Pumping and Supply Mains.

The forty-eight inch supply main from the East Park Reservoir to Sixth and York streets, which was partly laid last year, has been finished and put into use. The water was turned on April 29, 1890, resulting in a considerable improvement in the supply. All complaints from the section supplied by this main have been found to be due to "local causes."

No. 11 forty-eight inch pumping main to the East Park Reservoir has been completed and was put into use June 16, 1890. The overflow at the intersection of the division embankments was finished September 8, 1890.

A forty-eight inch supply main, to supply the First District, from the East Park Reservoir, was partly laid by laying 1698 feet of pipe, extending from the northwest side of the Connecting Railroad to north of Columbia avenue near Thirty-third street.

Excavation for the above mains was done by contract and the following shows the cost of labor to excavate the ditches and to lay the pipe (exclusive of material):

	Size of main.	Length of main.	Excavation, cubic yards.	Total cost of pipe trench.	Average cost per cubic yard.	Average cost per lineal foot.	Cost of labor laying pipes.	Ditto per lineal foot of pipe laid.	Total cost of excavation and labor laying pipes.	Ditto per lineal foot of pipe laid.
Pumping main from No. 11 Engine to supply E. P. Reservoir.....	48in	1686 ft.	5465	$1,934 79	35.4c	57.2c.	1,537.76	45c	3,472.55	$1.03
Supply main from E. P. Reservoir to the Connecting Railroad.....	48	1698								
Supply main from E.P. Reservoir to Sixth and York streets..	48	12,676	22,636	16,311 54	72½c	$1.29	4,644.50	36½	20,955.91	1.65

Supplemental Main.

A twenty-inch connection between No. 8 engine at the Spring Garden Pumping Station and the supplementary main from the East Park Reservoir was put in and finished February 9, 1890. It was used frequently to pump subsided water from the East Park Reservoir into the mains supplied by direct pumpage.

Susquehanna Avenue Mains.

Owing to the construction of a large sewer on Susquehanna avenue (formerly Otis street), from the old Kensington Pumping Station to Norris street, and the abandoning of the pumping station as a source of water supply, the 18 and 36-inch mains and connections were removed from the pumping station and from Susquehanna avenue as far as Richmond street, except a portion of the 18-inch main crossing Beach street and under the northeast side-walk of Susquehanna avenue, a distance of 192 feet. The 18-inch main from Richmond street to south side of Norris street was also removed. This work was commenced February 15 and finished December 20, 1890.

Broken Mains.

For some time past there has been serious trouble with the mains at the Spring Garden Pumping Station owing to numer-

ous "breaks" and constant "leaking" and "sweating" of joints. So serious was this trouble that it became a daily task to repair them. Investigation showed that this was due to the earth being loosened by repeated digging for leaks, etc., to such an extent that there was no solid earth to support the mains and hold them in place. To remedy this, masonry piers were built under all the pipes, since which time there have been no breaks and but one slight leak. On the 25th of August, at 1.30 A. M. there was a bad break in the 48-inch pumping main from Fairmount at Twenty-sixth street and Fairmount avenue. The water was shut off within a half hour and the break was repaired between 5 and 6 P. M.

Another serious break occurred late in the afternoon of December 13, in the 30-inch main on Old Second street above Tacony Creek, which was repaired about midnight of December 15.

In both these cases the mains were out of use during the time of repairing and considerable damage was done by washouts. No little trouble was prevented by the promptness in making the repairs and no cause could be given for the breaking of the pipe.

Meters.

Two hundred and seventy (270) meters have been set in new locations; fifty-eight (58) that were defective, or where a different size or style was required, have been renewed, and twenty one (21) taken out or dismantled by the removal of the piston where the use of water by meter was discontinued.

The total number of meters in use December 31, 1890, was five hundred and twenty-two (522); the number in stock is one hundred and thirty-eight (138), making a total of six hundred and ninety (690) meters in use and on hand, exclusive of three private meters and (3) new meters on trial.

Distribution.

The only change in the distribution of water throughout the City was made upon completing the 48-inch main on York

street. All that section formerly supplied from the old Kensington Pumping Station now receives its water from East Park Reservoir.

No other changes have been made, and the following shows in detail the sources, works, reservoirs and localities as they are now supplied:

Sources of Supply.	Pumping Works.	Reservoirs.	Wards Supplied.
Schuylkill River...	Belmont.....	George's Hill.....	24th, 27th and 34th Wards.
Schuylkill River...	Roxborough.....	Roxborough.....	21st and part of 28th Ward.
Schuylkill River...	Roxborough.....	Mount Airy.....	22d and part of 32d and 33d Wards.
Schuylkill River...	Spring Garden.....	By direct pump'e	29th and part of 15th, 19th 20th, 28th, 32d and 33d Wards.
Schuylkill River...	Fairmount.....	Fairmount.....	1st, 2d, 3d, 4th, 26th and 30th Wards.
		Corinthian.....	
Schuylkill River...	Spring Garden.....	Corinthian.....	5th, 6th, 7th, 8th, 9th, 10th, 11th, 12th, 13th, 14th, 16th, 17th, 18th, 31st, and part of 15th, 19th, 20th, 25th and 33d Wards.
		East Park.....	
		Lehigh.....	
Deleware River.....	*Frankford.....	Frankford.....	23d and part of 19th, 20th, 25th and 33d Wards.

*Frankford water is sometimes run by gravity into the Lehigh reservoir; also into the same reservoir from the direct pumpage district.

Horses and Wagons.

A change has been made in the First, Second and Fourth Districts by purchasing horses and wagons for permanent use instead of hiring them as heretofore.

Good stables, horses, wagons and all the necessary equipments have been provided for these Districts, as will be done for the other Districts as soon as practicable.

There should also be added a horse and wagon for the use of the purveyor of each district, whose duties are to have immediate charge of all mains, stops, fire hydrants and all other fixtures pertaining to the distribution of water throughout their districts. They must personally attend to all work and are responsible for its proper execution, as well as for all

materials; they are responsible for the various reports required, and for the pay rolls, and must perform all such duties as may be assigned them from time to time.

Since the present arrangement of the several districts (which was made in 1867) the duties of the purveyors have increased enormously. The pipeage in actual use has increased from 1,993,422 feet to 5,066,333 feet, equal to an increase of 582 miles or 254 per cent.; the number of fire hydrants, service attachments and all other matters pertaining to the distribution have increased in like proportion. When it is considered that the greater part of this increase is on the outer edge of the City or at points farthest from the center, it represents a vastly increased draft upon the time of the purveyors; in fact it is now impossible for them to reach the places required in their districts without the use of a horse and wagon, and the conveyances hired by the Bureau of Water are frequently used for this purpose. It would be far better to provide a suitable conveyance for each district, which would result in a better supervision of the districts, and the greater efficiency would amply repay the necessary cost.

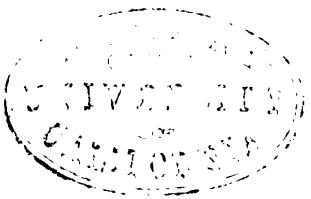
The following tables show in detail the work performed; also the cost of materials and labor.

Respectfully,

ALLEN J. FULLER,

Assistant in charge of Distribution.

18	19	
.....	.....	
42	81	
31	69	
39	113	
180	532	
141	460	
1,971	6,627	
.....	25	
.....	1	
.....	.....	
.....	.....	
7	13	
.....	.....	
2	10	
.....	78	
76	376	
.....	.....	
.....	.....	
.....	.....	
.....	.....	
471	32	
456	456	
23	46	
1	.....	
.....	43	
.....	.....	
5	33	
6	6	
110	47	
.....	.....	
3	.....	
.....	3	
6	6	
.....	13	
.....	.....	
4,848	10,617	8,
.....	8	
13	18	
.....	1	
.....	.....	
9	17	
.....	.....	
.....	.....	



IRON SERVICE AND SUPPLY MAINS LAID IN 1890.

FIRST DISTRICT.

Comprising the First, Second, Third, Fourth, Twenty-sixth and Thirtieth Wards.

Street. Location.	Size in inches.	Distance in feet.
Service Mains.		
Argyle street, from Fifth west to connect dead end	6	13
Bancroft street, from dead end 158 feet south of south house line of Moore, west	6	152
Broad street, east side, from Moore to Castle avenue	6	227
Chadwick street, from 12 feet south of north house line of Mifflin, north, to connect dead end	6	157
Charles street, from Federal to dead end 3 feet south of south house line of Moss	6	157
Daly street, from Second to Fifth	6	1,027
Daly street, from Ninth to 12 feet west of east house line of Tenth	6	433
Daly street, from 148 feet east of centre of Thirteenth west	6	148
Dean street, from dead end 154 feet north of north house line of Pierce to Morris	6	126
Dickinson street, from Lancaster to Second	6	299
Dickinson street, from Twenty-second to Twenty-third	6	470
Dorrance street, from Moore north to connect dead end	6	99
Dudley street, from west house line of Otsego to Front	6	237
East Second street, from McKean north to connect dead end	6	22
Eighteenth street, from 130 feet south of centre of Wolfe, north	6	130
Emily street, from Front street to 12 feet west of east house line of East Second	6	427
Emily street, from Old Second to Moyamensing avenue	6	554
Emily street, from 7 feet east of west curb line of Fourth, west, to connect dead end	6	6
Emily street, from Tenth, west	6	347
Fairhill street, from north house line of Wolf to Argyle	6	191
Fernon street, from Fifth to Sixth	6	448
Fernon street, from dead end west house line of Twenty-first to east curb line of Twenty-second	6	410
Federal street, from 97 feet west of west house line of Fourth to 6 feet west of east curb line of Seventh	.8	1215
Fifth street, from 12 feet south of north house line of Wolf to north house line of Jackson	6	477
Fourth street, from Snyder avenue to dead end 3 feet south of south house line of McKean	6	382
Front street, from Emily to dead end north house of McKean	6	167
Hancock street, from Jackson to 12 feet north of south house line of Snyder avenue	6	436
Hancock street, from 8 feet south of north house line of Snyder avenue, to McKean street	6	408

Street. Location.	Size in inches.	Distance in feet.
Service Mains—Continued.		
Jackson street, from 12 feet east of centre of Hancock to Old Second	6	174
Jackson street, from 12 feet east of west house line of Fourth to Fifth	6	437
Jackson street, from 4 feet east of west house line of Twelfth street west to connect dead end	6	250
Juniper street, from Passyunk avenue to 16 feet north of centre of Mifflin	6	376
Lancaster street, from Dickinson to Jarvis	6	32
McClellan street, from 11 feet 6 inches east of centre of Nineteenth, west	6	23
McKean street, from Front to dead end east house line of Old Second	6	686
McKean street, from Moyamensing avenue to Fourth	6	154
McKean street, from Thirteenth to 2 feet west of east house line of Juniper	6	227
McNeil avenue, from Mifflin street, north	6	361
Mercy street, from Second to Moyamensing avenue	6	557
Mercy street, from 7 feet east of west curb line of Fourth street, west to connect dead end	6	6
Mifflin street, from dead end 11 feet west of east house line of Juniper street, west	6	152
Mifflin street, from 12 feet 6 inches east of centre of Nineteenth street, west	6	28
Montrose street, from dead end 17 feet east of centre of Twenty-fifth street west to connect dead end	6	17
Moore street, from Ward to Nineteenth street	6	282
Mountain street, from 3 feet east of west house line of Eighteenth to Nineteenth street	6	424
Mountain street, from dead end west house line of Twenty-first to east curb line of Twenty-second	6	410
Nineteenth street, from 17 feet south of south house line of Mifflin to Moore	12	492
Parker street, from Washington avenue, north	6	35
Pierce street, from Seventeenth to 13 feet west of east house line of Eighteenth	6	434
Reese street, from 6 feet south of north house line of Wolf to Argyle	6	249
Ristine street, from 3 feet north of north curb line of Wolf to dead end, 251 feet 6 inches south of south house line of Jackson	6	223
Siegel street, from 15 feet 6 inches east of centre of Nineteenth street, west	6	28
Snyder avenue, north side from 6 feet east of west curb line of Fourth to Fifth street	6	443
Tree street, from Old Second to Fifth street	6	1049
Tree street, from Ninth to 12 feet west of east house line of Tenth	6	433
Tree street, from 4 feet east of west house line of Twelfth to Thirteenth street	6	425

Street. Location.	Size in inches.	Distance in feet.
Service Mains—Continued.		
Twenty-fifth street, from dead end 2 feet north of north house line of Carpenter to Gray's Ferry Road	12	310
Twenty-fourth street, from south house line of Federal street, north	6	25
Twenty-second street, from 50 feet south of south house line of Cross to Long lane	12	77
Twenty-third street, from Dickinson to Wilder	6	160
Twenty-third street, from south house line of Federal street, north	6	25
Ward street, from Moore street north to connect dead end	6	27
Washington avenue, north side from Fifth to Sixth	6	445
Watkins street, from dead end 144 feet west of west house line of Seventeenth to east house line of Eighteenth	6	252
Weccacoe street, from Queen street, north	6	25
Young street, from 299 feet south of centre of Wolf street, north	6	299
Total		18,215
Service Main Connections.		
Morton street, 4 feet 6 inches north of north house line of Queen, between 3-inch (to be relaid) and 6-inch mains on Morton	6	10
Reed street, 192 feet east of east house line of Otsego between 4-inch and 6-inch mains on north side of Reed	6	21
Total		31
Fire hydrant connections	6	969
Fire connections (private).		
Queen street, south side 92 feet west of house line of Delaware avenue for Southern Steamship Company	4	18
Supply connections (private.)		
Dickinson street, north side, east house line of Meadow, for Claus Spreckels	4	18
Eleventh street, east side, 50 feet south of south house line of Fitzwater, for Mutual Artificial Ice Company	3	
Reed street, south side, 63 feet west of west house line of Delaware avenue, for Claus Spreckels	6	23

Street. Location.	Size in inches.	Distance in feet.
Supply connections (private)—Continued.		
Twelfth street and Wharton in First District yard. for Bureau of Water	4	174
Total		215
Drains.		
Twelfth and Wharton streets, in First District yard, for Bureau of Water	4	324
Pipe relaid.		
Annapolis street, from 23 feet 6 inches south of north curb line of South, north	6	17
Baltimore street, from Federal, north	6	17
Bangor street, from Lloyd to Fifteenth	6	350
Canal street, from east house line of Fourth, west	6	25
Charles street, from 3 feet north of south house line of Moss to Washington avenue	6	401
Clements street, from Washington avenue to Carpenter	6	417
Dorrance street, from 7 feet south of north curb line of Washington avenue to Carpenter	6	419
Lloyd street, from 3 feet north of north house line of Fitzwater to Bainbridge	6	330
Morton street, from Queen, north	6	28
Moss street, from Charles to Seventh	6	256
Swanson street, west side, from Prime to Washington avenue	6	330
Total		2,590
Fire hydrant connections, relaid	6	565
Repairs, general	4	8
" "	6	888
" "	10	30
" "	16	11
Total		937

Street. Location.	Size in inches.	Distance in feet.
Pipe taken up.		
Annapolis street, from 23 feet 6 inches south of north curb line of South, north	3	17
Baltimore street, from Federal, north	4	17
Bangor street, from Lloyd to Fifteenth	3	360
Canal street, from east house line of Fourth, west	4	25
Charles street, from 3 feet north of south house line of Moss to Washington avenue	3	401
Clements street, from Washington avenue to Carpenter	4	420
Dorrance street, from Washington avenue to Carpenter	3	410
Lloyd street, from Fitzwater to Bainbridge	3	372
Moss street, from Charles, west	3	245
Swanson street, from Prime, north	3	130
Total		2,397
Fire hydrant connections taken up	4	234
" " "	6	16
Total		250
Pipe cut off and abandoned.		
Morton street, from Queen, north	3	28
Moss street, from 244 feet west of centre of Charles, west	3	12
Swanson street, from 130 feet north of centre of Prime to Washington avenue	3	200
Total		240
Fire hydrant connections cut off and abandoned	4	68

Recapitulation of First District.

	Purpose for which Used.	Sizes—Inches. 3	4	6	8	10	12	16	Total in Feet and Pounds.
New pipes or feet added.	Service mains			16,121	1,215		879		18,215
	Service main connections			31					31
	Fire hydrant connections			969					969
	Fire connections (private)		18						18
	Supply connections (private)		192	23					215
	Drains		324						324
	Total, Feet		534	17,144	1,215		879		19,772
	Total, Pounds		10,146	565,752	51,030		63,288		690,216
Pipe used, but adding nothing to feet in ground.	Pipe relaid			3,155					3,155
	Repairs, general		8	888		30		11	937
	Pipe taken up	1,935	696	16					2,647
	Total, Feet	1,935	704	4,059		30		11	6,739
	Total, Pounds	29,025	13,376	133,947		1,650		1,210	179,208
	Total handled, Feet	1,935	1,238	21,203	1,215	30	879	11	26,511
	Total handled, Pounds	29,025	23,522	699,699	51,030	1,650	63,288	1,210	869,424
Pipe cut off and abandoned		243	68						311

Second District.

Comprising the Fifth, Sixth, Seventh, Eighth, Ninth, Tenth, Twenty-fourth, Twenty-seventh and Thirty-fourth Wards.

Street.	Location.	Size in inches.	Distance in feet.
	Service Mains.		
Baring street,	from Thirty-first west, to connect dead end..	6	25
Brooklyn street,	from dead end 236 feet 2 inches north of centre of Parish to Ogden street	6	146
Fairmount avenue,	from Holly to Forty-second	6	175
Fiftieth street,	from Thompson to Kershaw avenue	6	244
Fiftieth street,	from Master to Lancaster	6	264
Fifty-eighth street,	from 150 feet southeast of southeast house line of Gibson avenue to Woodland avenue	6	2,440
Fifty-fifth street,	from 155 feet south of centre of Melrose to Haverford	6	468
Fifty-fifth street,	from Westminister avenue to Wyalusing avenue	6	510
Fifty-fifth street,	from 12 feet south of north house line of Hunter's lane to Merion avenue	6	253
Fifty-fifth street,	from Jefferson to Lancaster avenue	6	304
Fifty-first street,	from north property line of Philadelphia and West Chester Railroad to Baltimore avenue..	6	1,403
Fifty-first street,	from Master street to Lancaster avenue..	6	515
Fifty-fourth street,	from Vine to Melrose	6	300
Fifty-fourth street,	from Haverford to Wyalusing avenue..	6	1,118
Fifty-fourth street,	from 7 feet south of north house line of Supplee to Master	6	1,369
Fifty-fourth street,	from Lansdowne to Hunter's lane	6	346
Fifty-second street,	from Lancaster avenue to Warren	6	391
Fifty-sixth street,	from Ludlow to Market	6	281
Fifty-third street,	from 28 feet 4 inches south of centre of Girard avenue, north	6	65
Forty-eighth street,	from dead end 1 foot south of north house line of Kingsessing avenue to Sherborne or Regent	6	216
Forty-eighth street,	from Seneca to Wyalusing avenue	6	1,059
Forty-eight-and-one-half street,	from 9 feet north of centre of Paschall avenue to Gray's Ferry Road	6	384
Forty-fifth street,	from Woodland avenue to Baltimore avenue	12	1,795
Forty-first street,	from Westminister avenue, north	6	356
Forty-second street,	from Pennsgrove to Mantua	6	356
Forty-seventh street,	from Gray's Ferry Road, north	6	418
Forty-ninth street,	from dead end 129 feet north of north house line of Greenway avenue to south house line of Kingsessing avenue	6	373
Forty-ninth street,	from Regent to dead end 2 feet 6 inches south of south house line of Chester avenue...	6	225
Forty-ninth street,	from Haverford to Fairmount	6	295

Street. Location.	Size in inches.	Distance in feet.
Service Mains—Continued.		
Forty-third street, from 278 feet 2½ inches south of centre of Westminister avenue, north	6	278
Forty-third street, from Wyalusing avenue to Mantua avenue	6	245
Forty-three-and-one-half street, from 231 feet 9 inches south of centre of Westminster avenue, north	6	228
Forty-three-and-one-half street, from Wyalusing avenue to Mantua avenue	6	349
Girard avenue, from Fifty-second street to west house line of Fifty-fourth	6	861
Gray's Ferry Road, from Forty-seventh to Forty-eighth street	6	635
Hanson street, from Paschall, north, to dead end	6	90
Hanson street, from Greenaway avenue to Forty-ninth	6	572
Hoops street, from Forty-fifth to Forty-sixth	6	273
Irving street, from 12 feet east of west house line of Meadland avenue to Marston	6	423
Kingsessing avenue, from Forty-fifth, west, to connect dead end	6	55
Lansdowne avenue, from dead end 7 feet east of centre of Fifty-fifth to 1 foot 6 inches west of west house line of Sixtieth	6	2441
Lee avenue, from 1 foot east of west house line of Sixtieth to Sixty-first	6	412
Ludlow street, from 365 feet 11 inches east of centre of Fifty-sixth street, west	6	366
Marston street, from 12 feet east of west house line of Meadland avenue to Thirty-third street	6	548
Manley street, from Fifty-fourth to east curb line of Conestoga	6	322
Mantua avenue, from Thirty-fourth street, west	6	197
Mantua avenue, from Thirty-eighth street to Parrish	6	79
Melon street, from dead end west house line of Thirty-third to Thirty-fourth	6	389
Morrell street, from Fifty-fourth street to east curb line of Conestoga	6	322
Otter street, from Forty-second to Forty-third street	6	469
Parrish street, from Mantua avenue west to connect dead end	6	333
Paschall avenue, from Hanson street, west	6	9
Pennsgrove street, from east house line of Forty-second street, west	6	31
Pennsgrove street, from Forty-third street to Forty-fourth	6	394
Regent street, from Forty-fifth street to Forty-sixth street	6	490
Regent street, from east house line of Forty-ninth street, west	6	38
Reno street, from Thirty-eighth street, west to connect dead end	6	405
Sixty-first street, from Haverford avenue to 1 foot north of south house line of Paschall avenue	6	596

Street.	Location.	Size in inches.	Distance in feet.
	Service Mains—Continued.		
South street, from Sixtieth street, west		6	512
State street, from Egglesfield to Poplar		6	256
Thirty-eighth street, from Brown to Mantua avenue		6	357
Thirty-first street, from Powelton avenue to Baring street		6	460
Thirty-fourth street, from Fairmount avenue to Mantua avenue		6	207
Thirty-ninth street, from Lancaster avenue to Spring Garden street		6	179
Thirty-third street, from Marston street to Locust		6	41
Thompson street, from east house line of Fifty-fourth, west		6	51
Twentieth street, from Chestnut, north		6	30
Union street, from Egglesfield to Poplar		6	256
Warren street, from Fifty-first, west		6	25
Wyalusing avenue, from dead end 31 feet 7 inches east of centre of Fifty-fifth, west		6	32
Total			28,350
Fire hydrant connections		6	1,380
	Fire connections (private).		
Thirty-second street, east side, 241 feet south of south house line of Chestnut, for the Allison Manufacturing Company		6	28
	Supply connections (private).		
Chestnut street, north side, 111 feet east of east house line of Tenth, for Penn Mutual Life Insurance Company		3	10
Eleventh street, west side, 74 feet north of north house line of Pine, for W. G. Warden		4	16
Market street, south side, 33 feet east of east house line of Ninth, for Granville B. Haines & Co		3	5
Quince street, west side, 149 feet north of north house line of Pine, for W. G. Warden		4	9
Sansom street, south side, 101 feet west of west house line of Eighth, for "The Times" Publishing Company		3	
Twenty-third street, west side, 11 feet 6 inches north of north house line of Market, for Bureau of Gas		4	17
Total			57

Street.	Location.	Size in inches.	Distance in feet.
	Motor connections (private).		
Chestnut street, south side, 29 feet 6 inches east of east house line of Eleventh street, for Gilbert & Bacon....		4	.8
	Pipe relaid.		
Autumn street, from 2 feet south of south house line of Vine street, north		6	23
Chancellor street, from Sixteenth street, west		6	31
Chancellor street, from Thirty-second street, west		6	172
Dean street, from Spruce street, north		6	168
Dean street, from 4 feet 4½ inches south of south house line of Arizona to Walnut street		6	552
Erety street, from Sixteenth street, west		6	28
Exeter street, from Sixteenth street to 4 feet 2 inches west of west house line of Seventeenth		6	478
Hatton place, from Cherry to Race		6	338
Melloy street, from Sixteenth street, west		6	29
Moravian street, from 2 feet east of east house line of Sixteenth street, west		6	27
St. Joseph's avenue, from Seventeenth to Eighteenth		6	448
Total			2,294
Fire hydrant connections, relaid		6	1,014
Repairs general		3	7
" "		4	37
" "		6	672
" "		8	13
" "		10	114
" "		12	84
" "		16	6
" "		30	13
Total			946
	Pipe taken up.		
Autumn street, from 2 feet south of south house line of Vine, north		6	23
Chancellor street, from Sixteenth, west		3	31
Chancellor street, from Thirty-second, west		4	172
Dean street, from Spruce, north		4	171

Street.	Location.	Size in inches.	Distance in feet.
	Pipe taken up—Continued.		
Dean street,	from 4 feet 4½ inches south of south house line of Arizona to Walnut	3	544
Erety street,	from Sixteenth, west	3	28
Exeter street,	from Sixteenth, west	3	107
Exeter street,	from 240 feet west of west house line of Sixteenth to 4 feet 2 inches west of west house line of Seventeenth	3	211
Hatton place,	from Cherry to Race	3	358
Melloy street,	from Sixteenth, west	4	29
Moravian street,	from 2 feet east of east house line of Sixteenth, west	3	27
St. Joseph's avenue,	from Seventeenth to Eighteenth	3	420
	Total	.....	2,121
Fire hydrant connections taken up		3	25
" " "		4	950
	Total	.....	975
	Pipe lowered.		
Lancaster avenue,	from 61 feet east of east house line of Peach, west	6	443
Wyalusing avenue,	from 255 feet east of centre of Fifty-fifth, west	6	255
	Total	.....	698
Fire hydrant connections lowered		6	19
	Pipe raised.		
Orion street,	from 174 feet north of north house line of Fairmount avenue, north	6	109
	Pipe shifted.		
Thirty-ninth street,	north of centre of Haverford (from centre to 8 feet west of centre)	6	25

Street.	Location.	Size in inches.	Distance in feet.
	Pipe cut off and abandoned.		
Exeter street,	from 80 feet west of west house line of Sixteenth street, west	3	160
Spring Garden street,	from 1090 feet east of centre of Thirty-third street, west	6	1,090
	Total		1,250
Fire hydrant connections cut off and abandoned		3	30
" " "		4	53
" " "		6	6
	Total		89

Recapitulation of Second District.

	Purposes for which Used.	Sizes—Inches. 3	4	6	8	10	12	16	30	Total in Feet and Pounds.
New pipe or feet added.	Service mains			26,550			1,795			28,345
	Fire hydrant connections			1,380						1,380
	Fire connections (private)	15	42							57
	Motor connections (private)		8							8
	Total, Feet	15	50	27,930			1,795			29,790
	Total, Pounds	225	950	921,690			129,240			1,052,105
Pipe used, but adding nothing to feet in ground.	Pipe relaid			3,308						3,308
	Repairs, general	7	37	672	13	114	84	6	13	946
	Pipe taken up	1,751	1,322	23						3,096
	Pipe lowered			717						717
	Pipe raised			109						109
	Pipe shifted			25						25
	Total, Feet	1,758	1,359	4,854	13	114	84	6	13	8,201
	Total, Pounds	26,370	25,821	160,182	546	6,270	6,048	660	4,316	230,213
Total handled, Feet		1,773	1,409	32,784	13	114	1,879	6	13	37,991
Total handled, Pounds		26,595	26,771	1,081,872	546	6,270	135,288	660	4,316	1,282,318
Pipe cut off and abandoned		190	53	1,096						1,339

Third District.

Comprising the Eleventh, Twelfth, Sixteenth, Seventeenth, Eighteenth, Nineteenth, Twenty-third, Twenty-fifth, Thirty-first, and part of the Thirty-third Ward.

Street. Location.	Size in inches.	Distance in feet.
Service Mains.		
Abigail street, from Coral street, east	6	26
Almond street, street, from 57 feet 8 inches south of north house line of Somerset, north	6	26
Ann street, from Gaul to Chatham	6	211
Ardria street, from west curb line of Lawrence to Fifth	6	252
Beach street, from dead end 3 feet northeast of northeast house line of Susquehanna avenue, northeast	6	33
Belgrade street, from 2 feet north of south house line of Somerset, north	6	26
Blair street, from Susquehanna avenue, northeast	6	26
Cambria street, from Howard to Second	6	834
Cambria street, from east curb line of Marshall to dead end 7 feet west of east house line of Germantown avenue	6	1,332
Carey street, from 9 feet east of west house line of Lawrence to Fifth	6	250
Chatham street, from Ann to Clearfield	6	1,000
Clarion street. from Elkhart, north	6	144
Clearfield street, from 1 foot 6 inches east of east house line of Ruth, west	6	52
Coral street. from Somerset, north	6	37
Deal street, from 160 feet east of east house line of Harper, west	6	440
Eighth street, from 27 feet north of south house line of Lehigh avenue, north	6	69
Eighth street, from south to north house line of Cambria	6	50
Elkhart street, from Clarion to 2 feet west of east house line of Joyce	6	111
Eyre street, from Thompson, north	6	327
Fillmore street, from south house line of Ontario, north	6	38
Gaul street, from centre of Ann, north, to connect dead end	6	10
Glenwood street, from dead end 35 feet east of east house line of Turner to Fairhill	6	175
Hancock street, from south house line of Cambria, north	6	50
Harper street, from Deal to Adam	6	182
Hope street, from Ontario to north curb line of Tioga	6	567
Hull street, from 108 feet east of east house line of Third, west	6	134
Indiana avenue, from east to west house line of Second	6	61
Innes street, from Beach to Farson Place	6	134
Jasper street, from Wishart, north	6	155

Street.	Location.	Size in inches.	Distance in feet.
	Service Mains—Continued.		
Lawrence street.	from 4 feet 6 inches south of north house line of Westmoreland to dead end south house line of Ontario	6	512
Lee street,	from Ontario to Tioga	6	540
Linden street,	from Tackawanna to Mulberry	6	401
Marshall street,	from Somerset to Indiana	6	1,107
Mascher street,	from dead end 8 feet north of south house line of Cambria to 12 feet north of southwest house line of Guerney	6	510
Mayfield street,	from 169 feet east of east house line of Third, west	6	194
Mutter street,	from south house line of Cambria to south curb line of Indiana	6	562
Ninth street,	from 27 feet north of south house line of Lehigh avenue, north	6	69
Ontario street.	from 133 feet east of east house line of Fillmore to dead end 5 feet west of east house line of Front	6	859
Ontario street,	from 1 foot east of east house line of Third, west, to connect dead end	6	240
Orianna street,	from Indiana avenue, north	6	354
Orkney street,	from 372 feet south of south house line of Ontario, north, to dead end	6	372
Palethrop street,	from south curb line of Cambria, north	6	139
Penn street.	from Sellers to Orthodox	6	398
Philip street,	from south house line of Tioga to Glenwood	6	339
Ruth street,	from Orleans to 2 feet north of north house line of Clearfield	6	904
Rutledge stree,	from Cambria to Indiana	6	551
Second street.	from dead end 100 feet north of north house line of Cambria to north house line of Indiana avenue	6	457
Second street,	from 141 feet 6 inches south of south house line of Ontario, north, to connect dead end	6	45
Spring street,	from Somerset, north	6	26
Sterner street,	from Fillmore to Front	6	546
Third street,	from Indiana, north	6	387
Third street,	from south house line of Ontario to Glenwood	6	581
Tioga street,	from east to west house line of Hope	6	27
Tioga street.	from dead end east house line of Philip street, west	6	30
Thompson street,	from 15 feet south of centre of Somerset, north	6	15
Trenton avenue,	east side, from south house line of Susquehanna, north east	6	47
Trenton avenue,	west side, from south house line of Somerset, north	6	54

Street.	Location.	Size in inches.	Distance in feet.
	Service Mains—Continued.		
Walker street, from south house line of Somerset, north..		6	53
Waterloo street, from 4 feet 4 inches north of south house line of Montgomery avenue to Wilt		6	230
Waterloo street, from Cambria to Gurney		6	396
Weikle street, from 1 foot southwest of northeast house line of Ann to Clearfield		6	821
Westmoreland street, from Fifth street to dead end east house line of Sixth		6	536
Willow street, from east house line of New Market street, west		6	30
Willow street, from east house line of York avenue, west		6	58
Wilt street, from Howard to Mascher		6	267
Wishart street, from 120 feet east of east house line of Jasper to Kensington avenue		6	714
Total			20,123
	Supply Mains.		
Supply main from East Park reservoir to York and American streets.			
York street, south side, from Park avenue to dead end (laid 1889) 98 feet west of Germantown avenue		48	2,187
York street, from 29 feet 9 inches east of west house line of American, west, to connect dead end		36	67
Total			2,254
	Supply Main connections.		
American and York streets, west side, between 36-inch main on American and 6-inch main on York street		10	7
Lehigh avenue, 16 feet west of east house line of Seventh street, between 30-inch main in centre and 6-inch-main on the south side of Lehigh avenue		10	33
Susquehanna avenue and Belgrade, between 36-inch main on southwest side of Susquehanna avenue and 10-inch main on Belgrade street		10	9
Susquehanna avenue and Gaul street, between 36-inch main on Susquehanna avenue and 6-inch main on Gaul street		10	12
Susquehanna avenue and Cedar street, between 36-inch main on Susquehanna avenue and 6-inch main on Cedar street		6	7
York and Sixth streets, between 48-inch main on York street and 18-inch main on Sixth street		20	31
York and Seventh streets, between 48-inch main on York street and 18-inch main on Seventh		20	26

Street. Location.	Size in inches.	Distance in feet.
Supply main connections—Continued.		
York and Ninth streets, between 48 inch main on York street and 30 inch main on Ninth street	36	41
Total	.....	166
Fire hydrant connections	6	1,922
Fire connections (private).		
Glenwood avenue, north side, 200 feet 6 inches west of North Pennsylvania Railroad, for S. L. Allen & Co...	4	23
Huntington street, north side, 85 feet west of west house line of Reese street, for Stinson Bros. & Kurlbaum...	6	18
Letterly street, north side 85 feet east of east house line of Kensington avenve, for Peoplc's Theatre	4	14
Total	.....	55
Supply connections (private).		
Beach street, southeast side, 30 feet northeast of northeast house line of Susquehanna avenue, for Old Kensington station, Bureau of Water...	6	41
Cambria street, south side, 5 feet east of east house line of Third street, for Folwell Bros	4	18
Total	.....	59
Drains.		
Norris street, north side, 10 feet west of east house line of Trenton avenue, from 18 inch main	6	11
Norris street, north side, 24 feet west of east house line of Second street, from 6 inch main	6	7
Norris street, 18 feet west of east house line of Third street, from 6 inch main	6	7
Norris street, 24 feet west of northeast house line of Germantown avenue, from 6 inch main	6	9
Susquehanna avenue, southwest side, 15 feet southeast of northwest house line of Richmond, from 6 inch main	6	33
Susquehanna avenue, southwest side, 19 feet 6 inches southeast of northwest house line of Richmond, from 36 inch main	6	3

Street. Location.	Size in inches.	Distance in feet.
Drains—Continued.		
Susquehanna avenue, 57 feet northwest of Cedar, from 18 inch main	6	11
Susquehanna avenue, 69 feet northwest of Cedar, from 36 inch main	6	85
York and Ninth streets, between 48-inch main on York street and fire hydrant connection on southwest corner of Ninth	6	5
Total		171
Pipe relaid.		
Almond street, from Susquehanna avenue, north	6	13
Almond street, from Somerset street, northeast	6	14
Beach street, from 111 feet north of north house line of Noble street, north	6	24
Belgrade street, from Somerset street, north	6	20
Blair street, from 5 feet 4 inches southwest of southwest house line of Susquehanna avenue, northeast	6	5
Bodine street, from Norris street, north	6	25
Cedar street, from 15 feet northeast of southwest house line of Norris, northeast	6	28
Charlotta street, from 1 foot 6 inches south of south curb line of Thompson street, north	6	33
Chatham street, from Somerset street, north	6	23
Dillwyn street, from 17 feet 4 inches south of centre of Callowhill street, north	6	17
Dreer street, from 29 feet 10 inches southeast of centre of Coral street, northwest	6	30
Gaul street, from south house line of Somerset street, north	6	36
Gaul street, from 4 feet north of southwest house line of Susquehanna avenue, northeast	6	46
Gerker street, from Hanover, northeast	6	27
Girard avenue, southeast side, from 53 feet 9 inches southwest of northeast house line of Susquehanna, northeast	6	47
Girard avenue, northwest side, from 39 feet 6 inches southwest of northeast house line of Susquehanna, northeast	6	17
Holman street, from southwest house line of Susquehanna avenue, north	6	13
Holman street, from 15 feet 6 inches south of northeast house line of Susquehanna avenue, north	6	16
Margaretta street, from east house line of New Market, west	6	53
Moyer street, from southwest house line of Susquehanna avenue, northeast	6	24
Mutter street, from 14 feet south of centre of Norris, north	6	14
Norris street, from Cedar to Amber	6	1,988

Street. Location.	Size in inches.	Distance in feet.
Pipe relaid—Continued.		
Norris street, southwest side, from 166 feet 6 inches southeast of southeast house line of Trenton avenue, northwest..	6	181
Norris street, from Front to east house line of Hope.....	6	137
Norris street, from 4 feet east of west house line of Howard to west house line of Fifth	6	2,371
Norris street, from 62 feet east of northeast house line of Germantown avenue to east house line of Darien.....	6	1,241
Penn alley, from 29 feet south of centre of Callowhill street, north.....	6	29
Phillip street, from Norris, north	6	25
Randolph street, from 11 feet south of north house line of Oxford, north	6	170
Randolph street, from 50 feet south of north house line of Turner, north.....	6	154
Randolph street, from 112 feet south of south house line of Columbia avenue, north.....	6	112
Randolph street, from 22 feet north of south house line of Columbia avenue, north.....	6	26
Richmond street, from 22 feet 6 inches south of centre of Somerset, north.....	6	45
Siloam street, from Susquehanna avenue, north	6	14
Somerset street, from Richmond, west	6	86
Somerset street, from 18 feet west of west house line of Edgemont to west side of Aramingo Canal.....	6	1,904
Susquehanna avenue, southwest side, from Beach to Girard avenue	6	997
Susquehanna avenue, northeast side, from Beach to Girard avenue.....	6	1,001
Susquehanna avenue, from Girard to 4 feet 5 inches west of east house line of Cedar.....	6	1,731
Susquehanna avenue, northeast side, from Girard to Moyer..	6	211
Susquehanna avenue, southwest side, from 61 feet 3 inches southeast of southeast house line of Cedar, northwest..	36	86
Thompson street, from 127 feet east of east house line of Charlotta, west	6	176
Thompson street, from southwest house line of Susquehanna avenue, northeast.....	6	29
Thompson street, from Somerset, north.....	6	22
Townsend street, from southeast house line of Tulip, northwest.....	6	42
Trenton avenue, northwest side, from southwest to northeast house line of Susquehanna avenue.....	6	50
Turner street, from Randolph, west.....	6	10
Volkmar street, from Hanover, northeast.....	6	27
Wilmer street, from 27 feet 4 inches east of centre of Second, west.....	6	27
Wood street, from Second, west.....	6	28
Total.....	.....	13,445

Street.	Location.	Size in inches.	Distance in feet.
Fire Hydrant Connections, relaid		6	568
	Pipe taken up.		
Almond street, from Susquehanna avenue, north		6	13
Almond street, from Somerset, northeast.		6	14
Beach street, from 111 feet north of north house line of Noble, north		4	24
Belgrade street, from Somerset, north		6	20
Blair street, from 5 feet 4 inches southwest of southwest house line of Susquehanna avenue, northeast		4	5
Bodine street, from Norris, north		6	25
Charlotte street, from 1 foot 6 inches south of south curb line of Thompson, north		4	33
Chatham street, from Somerset, north		6	23
Dillwyn street, from 17 feet 4 inches south of centre of Callowhill, north		3	17
Dreer street, from 29 feet 10 inches southeast of centre of Coral, northwest		4	30
Gaul street, from south house line of Somerset, north		6	36
Gaul street, from 4 feet northeast of southwest house line of Susquehanna avenue, northeast		6	46
Gerker street, from Hanover, northeast		4	27
Girard avenue, southeast side, from 53 feet 9 inches southwest of northeast house line of Susquehanna avenue, northeast		6	47
Girard avenue, northwest side, from 39 feet 6 inches southwest of northeast house line of Susquehanna avenue, northeast		6	17
Holman street, from southwest house line of Susquehanna avenue, north		4	13
Holman street, from 15 feet 6 inches south of northeast house line of Susquehanna avenue, north		4	16
Margaretta street, from east house line of New Market west		3	53
Moyer street, from southwest house line of Susquehanna avenue, northeast		4	24
Mutter street, from 14 feet south of centre of Norris, north		4	14
Norris street, from Cedar to east house line of Hope		6	2,308
Norris street, from west house line of Howard to east house line of Darien		6	3,554
Penn alley, from 29 feet south of centre of Callowhill street, north		3	29
Philip street, from Norris, north		4	25
Randolph street, from 11 feet south of north house line of Oxford, north		6	170
Randolph street, from 50 feet south of north house line of Turner, north		6	154
Randolph street, from 112 feet south of south house line of Columbia avenue, north		6	112

Street. Location.	Size in inches.	Distance in feet.
Pipe taken up—Continued.		
Randolph street, from 22 feet north of south house line of Columbia avenue, north	6	26
Richmond street, from 22 feet 6 inches south of centre of Somerset, north	6	45
Siloam street. from Susquehanna avenue north	6	14
Somerset street, from Richmond, west	6	86
Somerset street, from 18 feet west of west house line of Edgemont to west side of Aramingo Canal	6	1,904
Susquehanna avenue, from old Kensington Pumping Station to east house line of Cedar street	6	2,730
Susquehanna avenue, from 192 feet northwest of southeast house line of Beach to Cedar street	18	2,864
Susquehanna avenue, from old Kensington Pumping Station to Richmond	36	492
Susquehanna avenue, from 61 feet 3 inches southeast of southeast house line of Cedar street, northwest	36	86
Thompson street, from 127 feet east of east house line of Charlotta, west	4	176
Thompson street, from southwest house line of Susquehanna avenue, northeast	4	29
Thompson street, from Somerset, north	6	22
Townsend street, from southeast house line of Tulip, northwest	4	42
Trenton avenue, northwest side, from southwest to northeast house line of Susquehanna	4	50
Turner street, from Randolph, west	6	10
Volkmar street, from Hanover, northeast	4	27
Wilmer street, from 27 feet 4 inches east of centre of Second, west	3	27
Wood street, from Second, west	4	28
Total	.....	15,507
Fire hydrant connections taken up	4	621
" " "	6	84
Total	.....	705
Pipe lowered.		
Palethorpe street, from 210 feet south of centre of Cambria, north	6	210
Second street, from 364 feet south of south house line of Cambria, north	6	360
Total	.....	570

Street. Location.	Size in inches.	Distance in feet.
Pipe raised.		
Indiana avenue, from 90 feet east of east house line of Oram, west	6	90
Pipe cut off and abandoned.		
Randolph street, from 22 feet north of south house line of Columbia avenue, north	6	9
Susquehanna avenue, from old Kensington Pumping Station, northwest	18	192
Total		201
Fire Hydrant connections, cut off and abandoned	4	60

Recapitulation of Third District.

	Purposes for which Used	Sizes—Inches. 3	4	6	8	10	12	18	20	30	36	48	Total in Feet and Pounds.
New pipe or feet added.	Service mains			20,123									20,123
	Supply mains										67	2,187	2,254
	Supply main connections			7		61			57		41		166
	Fire hydrant connections			1,922									1,922
	Fire connections (private)		37	18									55
	Supply connections (private)		18	41									59
	Drains			171									171
	Total, Feet		55	22,282		61			57		108	2,187	24,750
	Total, Pounds		1,045	735,306		3,355			9,063		45,576	1,279,395	2,073,740
Pipe used but adding nothing to feet in the ground.	Pipe relaid			13,927							86		14,013
	Repairs, general			1,136	4	89	6		21	13	72		1,341
	Pipe taken up	126	1,184	11,460				2,864			578		16,212
	Pipe lowered			570									570
	Pipe raised			90									90
	Total, Feet	126	1,184	27,183	4	89	6	2,864	21	13	736		32,226
	Total, Pounds	1,890	22,496	897,039	168	4,895	432	400,960	3,339	4,316	310,592		1,646,127
	Total handled, Feet	126	1,184	49,465	4	150	6	2,864	78	13	844	2,187	56,976
	Total handled, Pounds	1,890	23,541	1,632,345	168	8,250	432	400,960	12,402	4,316	356,168	1,279,395	3,719,867
Pipe cut off and abandoned			60	9				192					261

Fourth District.

Comprising the Thirteenth, Fourteenth, Fifteenth, Twentieth, Twenty-ninth, Thirty-second, and part of the Twenty-eighth Ward.

Street. Location.	Size in inches.	Distance in feet.
Service Mains.		
Alleghany avenue, south side, from east house line of Broad, west	6	34
Allegheny avenue, south side, from 34 feet 6 inches east of west house line of Broad, west	6	45
Allegheny avenue, north side, from east house line of Broad, west	6	18
Allegheny avenue, north side, from 34 feet 6 inches east of west house line of Broad, west	6	50
Allegheny avenue, south side, from 12 feet 2 inches east of east house line of Fifteenth, west to connect dead end	6	261
Allegheny avenue, north side, from 8 feet,4 inches east of east house line of Fifteenth, west	6	33
Bancroft (or Atlantic) street, from dead end 235 feet north of Dauphin to York	6	292
Bartram street, from Jefferson to Hubbs	6	397
Broad street, east side, from dead end 12 feet 2 inches north of south house line of Allegheny avenue, north	6	128
Carlisle street, from dead end 4 feet north of north house line of Diamond to Susquehanna avenue	6	536
Clarion street, from dead end 12 feet 6 inches south of north house line of York to Hagert	6	370
Clearfield street, from 2 feet 8 inches west of east house line of Broad, west	6	32
Clearfield street, from Fifteenth to Sixteenth	6	448
Cleveland avenue, from dead end south house line of Dauphin to York	6	581
Clifford street, from east house line of Thirty-first to to Thirty-third street	6	962
Colona street, from Tenth, west	6	184
Columbia avenue, south side, from dead end east side of Pennsylvania Railroad bridge to 9 feet 5 inches west of west house line of Thirty-first street	6	169
Corlies street, from Ridge avenue to Susquehanna avenue	6	501
Dauphin street, from Eighteenth to east house line of Nineteenth	6	429
Dauphin street, from west house line of Nineteenth to dead end 2 feet west of west house line of Twenty-second	6	1,379
Diamond street, from east house line of Nineteenth to dead end east house line of Gratz	6	227

Street.	Location.	Size in inches.	Distance in feet.
	Service mains—Continued.		
Diamond street,	from dead end west house line of Twenty-eighth to to dead end 51 feet east of east house line of Harrison avenue	6	215
Diamond street,	south side. from 37 feet 6 inches east of east house line of Twenty-ninth, west	6	73
Dover street,	from Master to Jefferson	6	505
Eighteenth street,	from Dauphin to York.	6	550
Emlen street,	from Park avenve to Broad street	6	346
Folson avenue,	from Twenty-sixth to Taney	6	228
Fowler street,	from south house line of Swain, north	6	20
Garnet street,	from 23 feet south of north house line of Dauphin, north	6	23
Gratz street.	from Diamond to dead end 6 feet south of south house line of Susquehanna avenue	6	513
Gratz street,	from Dauphin to York	6	544
Hagert street,	from Clarion to dead end west house line of Thirteenth	6	103
Hamilton street,	from east house line of Broad, west	6	17
Hare street,	from Twenty sixth to Taney	6	225
Hollywood street,	from 2 feet 6 inches south of north house line of Thompson to 193 feet north of centre of Master	6	633
Jefferson street,	from 2 feet east of west house line of Thirtieth to Thirty-first	6	429
Lambert street,	from 9 feet 8 inches north of south house line of Dauphin, north	6	13
Marston street,	from Montgomery avenue, north	6	31
Marston street,	from 1 foot southeast of northwest house line of Elwood to dead end 13 feet northwest of southeast house line of Sedgely avenue	6	182
Master street,	from 4 feet west of east house line of Thirty-second to east house line of Thirty-third	6	448
Montgomery avenue,	from 12 feet east of west house line of Thirty-first to Thirty-third	6	931
Myrtlewood avenue.	from dead end 10 feet south of north house line of Thompson to Master	6	449
Nevada street,	from Twenty-ninth, west	6	146
Newkirk street.	from Diamond to Susquehanna avenue	6	652
Nineteenth street,	from 40 feet south of north house line of Susquehanna avenue to 1 foot 6 inches north of south house line of Dauphin	6	573
Opal street,	from 25 feet south of north house line of Dauphin, north	6	23
Park avenue,	from 12 feet south of north house line of York street to dead end 117 feet south of south house line of Cumberland	6	395
Park Terrace,	from Twenty-sixth street to Taney	6	225
Philadelphia street,	from dead end 2 feet north of south house line of Clearfield, north	6	24

Street.	Location.	Size in inches.	Distance in feet.
	Service mains—Continued.		
Rennier's avenue,	from 113 feet 6 inches south of south house line of Poplar, north	6	139
Rush street,	from Broad, west	6	38
Sedgeley avenue,	from Broad street, northeast	10	40
Seventeenth street,	from York to Cumberland	6	550
Sixteenth street,	from Tucker, north	6	16
Sommerville street,	from dead end 33 feet west of west house line of Mervine, west to connect dead end	6	141
Spring Graden street,	north side, from Twenty-third, west to connect dead end	6	27
Stanley street,	from Ridge avenue to Susquehanna	6	378
Susquehanna avenue,	from dead end, 20 feet west of east house line of Nineteenth to Uber street	6	232
Sydenham street,	from Indiana avenue to south house line of Clearfield	6	525
Thirteenth street,	from 301 feet 10 inches south of south line of Dauphin, north	6	326
Thirty-first street,	from Columbia avenue to north house line of Clifford	6	301
Thirty-second street,	from dead end 3 feet south of north house line of Master to 14 feet north of south house line of Jefferson	6	474
Thirty-second street,	from south house line of Clifford, north	6	50
Thomas avenue,	from dead end 167 feet north of north house line of York to Cumberland	6	358
Tucker street,	from Fifteenth to Sixteenth	6	446
Twelfth street,	from Dauphin, north	6	511
Twentieth street,	from dead end 36 feet north of north house line of Dauphin to York	6	491
Twenty-first street,	from dead end south house line o Susquehanna avenue to north house line of Dauphin	6	641
Twenty-ninth street,	from Jefferson to dead end south house line of Oxford	6	500
Twenty-second street,	from dead end 13 feet 6 inches north of north house line of Diamond to Susquehanna ave.	6	535
Twenty-second street,	from 2 feet south of south house line of Huntingdon, north	6	27
Uber street,	from Susquehanna avenue, north	6	38
Uber street,	from south house line of Dauphin, north	6	25
VanPelt street,	from 11 feet 5 inches north of south house line of Dauphin street, north	6	39
Warnock street,	from 2 feet south of north house line of Indiana avenue to Germantown avenue	6	385
Whitehall street,	from east house line of Broad, west	6	24
Willington street,	from York to Cumberland	6	550
Woodstock street,	from 9 feet 8 inches north of south house line of Dauphin, north	6	13

Street. Location.	Size in inches.	Distance in feet.
Service mains—Continued.		
York street, from Twenty-ninth to dead end east house line of Thirtieth street	6	436
Total		23,848
Supply mains.		
Supply main from East Park reservoir to Twenty-fifth and Spring Garden streets.		
From dead end of pipe (laid 1888) on north-west side of Pennsylvania railroad to a point 314 feet 6 inches north of north house line of Columbia avenue	48	1,698
Supply main from East Park reservoir to York and American streets.		
From Thirty-third and Montgomery avenue to Sedgley avenue, to York street, to Park avenue	48	10,489
Total		11,187
Pumping mains.		
No. 11 main, from former dead end (laid 1889), northeast of Spring Garden station to dead end (laid 1888), southwest side of Pennsylvania railroad	48	222
No. 11 main, from dead end northeast side of Pennsylvania railroad to dead end (laid in 1889), south of west division bank of East Park reservoir	48	1,464
No. 11 main, stand pipe for "overflow" at intersection of division banks	48	12
Total		1,698
Service main connections.		
Allegheny avenue, 15 feet east of west house line of Eighteenth street, between 6 inch main on north side and 6 inch main on south side of Allegheney avenue	6	40
Broad and Allegheny avenue, between 6 inch main on east side and 12 inch main on west side of Broad	10	42
Ninth and Spring Garden streets, west side, between 6 inch main on north side and 10 inch main on south side of Spring Garden	6	69
Seventh and Spring Garden streets, east side, between 6 inch main on north side and 10 inch main on south side of Spring Garden	6	69

Street. Location.	Size in inches.	Distance in feet.
Service main connections—Continued.		
Spring Garden street, 12 feet west of east house line of Thirteenth, between 6 inch main on north side and 10 inch main on south side of Spring Garden	6	68
Spring Garden street, 9 feet 2 inches east of east house line of Twenty-fifth, between 6 inch main on north side and 6 inch main on south side of Spring Garden	6	66
Tenth and Spring Garden streets, east side, between 6 inch main on north side and 10 inch main on south side of Spring Garden	6	68
Total		422
Supply Main Connections.		
Broad and York streets, between 30 inch main on Broad and 48 inch main on York	30	15
East Park Reservoir, between two 36 inch connections to Montgomery avenue Stop House and York street, 48 inch main	36	170
Thirty-third street, between Norris street Stop House East Park Reservoir, and York street 48 inch main	48	12
Total		197
Pumping Main Connections.		
Spring Garden Station, from suction pipe No. 8 Engine to No. 11 Supplementary Lift	20 26 30	83 13 6
Total		102
Bye-Pass Connections.		
York street, 18 feet east of east house line of Broad on 48 inch main (also intended to be used as a draw off)	6	60
Fire Hydrant connections	6	3,154

Street. Location.	Size in inches.	Distance in feet.
Fire connections (private.)		
Hamilton street, north side, 204 feet 6 inches west of west house line of Fifteenth, for Baldwin Locomotive Works	6	17
Spring Garden street, centre, 16 feet east of west house line of Fifteenth, for Baldwin Locomotive Works	8	13
Total		30
Supply connections (private.)		
Callowhill street, north side, 86 feet west of west house line of Twentieth, for Bement, Miles & Co	3	23
Master street, north side, 22 feet east of east house line of Twenty-sixth, west, for Fourth District Yard, Bureau Water	6	175
North College avenue, south side, 45 feet west of southwest house line of Ridge avenue, for Girard College	3	44
Thirty-second street, west side, 127 feet north of north house line of Thompson, for Theiss' Brewery	4	8
Total		250
Drains.		
East Park Reservoir at Montgomery avenue stop house, from north 36-inch outlet	10	4
Fairmount Park, 735 feet south of north house line of Columbia avenue, from 48-inch main	6	12
Master street, from 21 feet east of east house line of Twenty-sixth to Twenty-seventh, to connect drain from Fourth District Yard, Bureau of Water	4	439
Twenty-sixth and Master streets, Fourth District Yard, Bureau of Water, to drain stable, etc	4 6	67 21
Sedgley avenue, 39 feet northeast of east house line of Twenty-fifth, from 48 inch main	6	8
Sedgley avenue, 26 feet southeast of west house line of Thirtieth, from 48 inch main	6	6
Spring Garden Station, in front of engine house	6	77
Spring Garden Station, from 17 feet 4 inches northeast of storehouse, southeast to 10-inch drain from spring at foot of steps	6	83
Spring Garden street, east house line of Twenty-fifth, from 6-inch main	6	4

Street.	Location.	Size in inches.	Distance in feet.
	Drains—Continued.		
York street, south side, 17 feet 9 inches west of east house line of Twentieth, from 48-inch main		6	13
York street, 195 feet 6 inches west of west house line of Twenty-second, from 48-inch main		6	11
	Total		745
	Pipe relaid.		
Broad street, east side, from Indiana to Sedgley avenue		10	103
Darien street, from 1 foot 4 inches south of south house line of Oxford, north		6	50
Hutchinson street, from south house line of Oxford, north		6	25
Sartain street, from 3 feet south of south house line of Girard avenue, north		6	23
Swain street, from Fifteenth to Seventeenth		6	895
Twentieth street, from 2 feet south of south house line of Dauphin, north		6	94
Warnock street, from 2 feet 3 inches south of south house line of Oxford, north		6	32
Wood street, from 8 feet 11 inches east of east house line of Eighth, west		6	55
	Total		1,277
Fire hydrant connections relaid		6	132
Repairs, general		3	205
" "		4	806
" "		6	1,593
" "		8	11
" "		10	221
" "		12	109
" "		20	19
" "		30	12
" "		48	9
	Total		2,985
	Pipe taken up.		
Broad street, east side, from Indiana to Sedgley avenue		6	114
Darien street, from 1 foot 4 inches south of south house line of Oxford, north		4	50

Street. Location.	Size in inches.	Distance in feet.
Pipe taken up—Continued.		
Hutchinson street, from south house line of Oxford, north	4	25
Sartain street, from 3 feet south of south house line of Girard avenue, north	4	23
Swain street, from Fifteenth to Sixteenth	4	448
Warnock street, from 3 feet 3 inches south of south house line of Oxford, north	4	32
Wood street, from 8 feet 11 inches east of east house line of Eighth, west	4	10
Wood street, from centre of Eighth, west	4	25
Total		727
Fire hydrant connections taken up	3	8
" " "	4	102
" " "	6	12
Total		122
Pipe lowered.		
Broad street, east side, from Cambria, north	12	141
Broad street, west side, from 458 feet south of south house line of Indiana avenue, north	6	483
Broad street, east side, from Indiana avenue, north	6	270
Broad street, west side, from Indiana avenue, north	12	255
Indiana avenue, from Broad street, west	6	79
Mayfield street, from Broad street, west	6	65
Total		1,293
Fire hydrant connections lowered	6	23
Pipe cut off and abandoned.		
Swain street, from Sixteenth to Seventeenth	4	446
Twentieth street, from 2 feet south of south house line of Dauphin, north	6	94

Street.	Location.	Size in inches.	Distance in feet.
Pipe cut off and abandoned—Continued.			
Wood street,	from 1 foot west of east house line of Eighth, west	4	19
	Total		559
Fire hydrant connections cut off and abandoned		4	1,383
" " " " " "		6	167
	Total		1,550

Recapitulation of Fourth District.

	Purposes which for used.	Sizes—Inches. 3	4	6	8	10	12	20	26	30	36	48	Totals in feet and pounds.
New pipe or feet added.	Service mains			23,808		40							23,848
	Supply mains											11,187	11,187
	Pumping mains											1,698	1,698
	Service main connections			380		42							422
	Supply main connections									15	170	12	197
	Pumping main connections							83	13	6			102
	Bye-pass connections			60									60
	Fire hydrant connections			3,154									3,154
	Fire connections (private)			17	13								30
	Supply connections (private)	67	8	175									250
	Drains		506	235		4							745
	Total Feet	67	514	27,829	13	86		83	13	21	170	12 897	41,693
	Total Pounds	1,005	9,766	918,357	546	4,730		13,197	4,199	6,972	71,740	7,544,745	8,575,257
Pipe used, but adding nothing to feet in the ground.	Pipe relaid			1,306		103							1,409
	Repairs general	205	806	1,593	11	221	109	19		12		9	2,985
	Pipe taken up	8	715	126									849
	Pipe lowered			920			396						1,316
	Total Feet	213	1,521	3,945	11	324	505	19		12		9	6,559
	Total Pounds	3,195	28,899	130,185	462	17,820	36,360	3,021		3,984		5,265	229,191
	Total handled.. Feet	280	2,035	31,774	24	410	505	102	13	33	170	12,906	48,252
	Total handled.. Pounds	4,200	38,665	1,048,542	1,008	22,550	36,360	16,218	4,199	10,956	71,740	7,550,010	8,804,448
	Pipe cut off and abandoned		1,848	261									2,109

Fifth District.

Comprising the Twenty-first and part of the Twenty-eighth Ward.

Street. Location.	Size in inches.	Distance in feet.
Service Mains.		
Adams street, from dead end 2 feet southwest of southwest house line of Vincent, northeast	6	61
Ashland avenue, from Shur's lane to Penn	6	675
Cotton street, from Terrace to Belair	6	397
Davis street, from dead end 5 feet 6 inches southwest of southwest house line of Ezekiel, northeast	6	21
Dupont street, from dead end 814 feet northeast of northeast house line of Ridge avenue to Manayunk avenue	6	25
Dupont street, from dead end southwest house line of Selig, northeast	6	12
East street, from dead end 84 feet northeast of northeast house line of Terrace, northeast	6	48
Ezekiel street, from Markle to Shur's lane	6	455
Fleming street, from Grape to southeast house line of Levering	6	202
Freeland avenue, from dead end southeast house line of Penn, northwest	6	12
Greenough street, from Mansion avenue to Hamilton	6	227
Hermit street, from 5 feet southwest of southwest house line of Ridge avenue, northeast	6	32
Hillside avenue, from 18 feet southwest of centre of Ashland avenue, northeast	6	18
Jeannette street (or Rochelle avenue), from dead end southwest curb line of Freeland avenue to 86 feet 6 inches northeast of centre of Retta	6	483
Jefferson street, from Jackson to Washington	6	248
Jefferson street, from dead end northeast house line of Selig, northeast	6	339
Manayunk avenue, from southeast to northwest house line of Adams	6	50
Manayunk avenue, from 317 feet southeast of southeast house line of Cedar, northwest to dead end	6	64
Manayunk avenue, from southeast to northwest house line of Roxborough avenue	10	60
Manayunk avenue, from 79 feet southeast of southeast house line of Martin, northwest	10	79
Manor street, from Adams, northwest	6	25
Markle street, from dead end northeast house line of Pechin to Mitchell	6	537
New Queen street, from dead end, 208 feet northeast of northeast house line of Cresson to Thirty-fifth	6	522
Osborne street, from Philadelphia and Reading railroad to Ridge avenue	6	237

Street. Location.	Size in inches.	Distance in feet.
Service mains—Continued.		
Pechin street, from dead end southest house line of Roxborough avenue, northwest to connect	6	30
Port Royal avenue, from 540 feet northeast of northeast house line of Ann street to Ridge avenue	6	1,426
Rector street, from southwest to northeast house line of Pechin	6	50
Roxborough avenue, from Belair to dead end 96 feet 6 inches northeast of centre of Pechin	12	915
School Lane from 12-inch main on southwest side of Ridge avenue, northeast	6	11
Terrace street, from 161 feet southeast of southeast house line of Cedar, northwest	6	186
Tower street, from Cedar lane, northwest	6	175
Tioga street, from southwest house line of Twenty-third, northeast to dead end	6	29
Twenty-third street, from southeast house line of Tioga to southeast curb line of Venango	6	562
Virginia street, from southwest to northeast house line of Twenty-third	6	50
Warner street, from dead end, southwest house line of Ezekiel, northeast	6	15
Webster street, from Centre, northwest	6	17
Total		8,295
Supply mains.		
Ridge avenue, from dead end southeast curb line of Upper Rodman to dead end 85 feet southeast of centre of bridge over Wissahickon Creek	12	2,328
Ridge avenue, from dead end 70 feet northwest of centre of bridge over Wissahickon Creek to dead end centre of Hermit	12	4,112
Total		6,440
Service main connections.		
Ridge avenue and Dawson street, between 12 inch main on southwest side of Ridge avenue and 6 inch main in centre	6	13
Fire hydrant connections	6	144

Street. Location.	Size in inches.	Distance in feet.
Fire connections (private).		
Main street, southwest side, 4 feet northwest of northwest house line of Levering, for Francis W. McDowell.....	4	27
Drains.		
Ridge avenue, northwest side, entrance to Bridle Path over Wissahickon Creek from 12 inch main.....	6	39
Roxborough reservoir, between east wall of basin and pumping station, southeast to William's lane.....	4	81
Total	.....	120
Fire Hydrant connections relaid.....	6	46
Repairs, general.	4	20
" "	6	95
" "	10	12
Total	.....	127
Pipe taken up.		
Hemlock street, intersection of Vicaris.....	4	48
Wissahickon Creek, west side "Pipe Aqueduct".....	20	104
Total	.....	152
Fire Hydrant connections taken up.....	4	47
Pipe Lowered.		
Bowman street, from northeast house line of Cresson, northeast	6	129
Centre street, from northeast curb line of Clay to Webster	6	283
Cresson street, from Fairview avenue northwest.....	6	90
Fairview avenue, from Cresson, northeast	6	20
Fleeson street, from 204 feet southwest of southwest house line of Ridge avenue, northeast.....	6	168
Freeland avenue, from 108 feet southeast of southeast house line of Penn, northwest.....	.6	108

Street. Location.	Size in inches.	Distance in feet.
Pipe lowered—Continued.		
Hemlock street, from 300 feet southwest of southwest house line of Vicaris, northeast	6	378
Ridge avenue, from 805 feet southeast of southeast house line of Sumac, northwest	6	651
Ridge avenue, from 230 feet southeast of northwest house house line of Prospect, northwest	20	220
School Lane, from 36 feet southeast of northeast house line of Ridge avenue, northwest	6	50
Sunnyside avenue, from 203 feet southwest of southwest house line of Thirty-fifth street, northeast	6	78
Webster street, from 120 feet southeast of centre, northwest	6	120
Total	.....	2,295
Fire hydrant connections lowered	4	43
Pipe cut off and abandoned.		
Wissahickon Creek, east side, "Pipe Aqueduct"	20	48

Recapitulation of Fifth District.

	Purposes for which Used.	Sizes—Inches. 4	6	10	12	20	Total in feet and pounds.
New pipe or feet added.	Service mains		7,241	139	915		8,295
	Supply mains				6,440		6,440
	Service main connections		13				13
	Fire hydrant connections		144				144
	Fire connections (private)	27					27
	Drains	81	39				120
	Total ..... Feet	108	7,437	139	7,355		15,039
	Total ..... Pounds	2,052	245,421	7,645	529,560		784,678
Pipe used but adding nothing to feet in ground.	Pipe relaid		46				46
	Repairs, general	20	95	12			127
	Pipe taken up	95				104	199
	Pipe lowered	43	2,075			220	2,338
	Total ..... Feet	158	2,216	12		324	2,710
	Total ..... Pounds	3,002	73,128	660		51,516	128,306
	Total handled ..... Feet	266	9,653	151	7,355	324	17,749
	Total handled ..... Pounds	5,054	318,549	8,305	529,560	51,516	912,984
	Pipe cut off and abandoned					48	48

Sixth District.

Comprising the Twenty-second and part of the Twenty-eighth and Thirty-third Wards.

Street. Location.	Size in inches.	Distance in feet.
Service Mains.		
Allen's lane, from 23 feet southwest of southwest house line of Cresheim road, northeast to 10-inch connection from Mount Airy Pumping Station	10	429
Atlantic street, from east house line of Nineteenth street, west	6	51
Baird street, from Penn, northwest	6	24
Bellfield street, from dead end 9 feet southeast of northwest house line of Penn to Mill	6	1,051
Bloyd street, from Locust avenue, northwest	6	216
Borie street, from Broad, west	6	34
Butler street, from east to west house line of Fifteenth	6	50
Cedar lane, from 25 feet southeast of centre of Chelten avenue, northwest	6	57
Chelten avenue, from 4 feet southwest of northeast house line of Wilson to dead end northeast house line of Cedar lane	6	693
Chew street, from dead end 334 feet southeast of centre of Walnut lane, northwest to dead end	6	545
Cresheim road, from southeast house line of Allen's lane, northwest	6	29
Dounton street, from 45 feet 7 inches southwest of northeast house line of Germantown avenue, northeast	6	608
Durham street, from Chew to Boyer	6	675
Earlham street, from northeast house line of Morris to Pulaski	6	507
Eighteenth street, from south house line of Westmoreland, north	6	50
Emlen street, from southeast to northwest house line of Upsal	6	85
Emlen street, from Franklin to Westview avenue	6	716
Engle street, from Price, northwest	6	25
Erie avenue, from 37 feet 6 inches east of west house line of Broad, west	6	38
Erie avenue, from east to west house line of Fifteenth	6	50
Evans street, from Price to Centre	6	329
Fifteenth street, from Allegheny avenue to dead end south house line of Ontario	6	1,094
Fifteenth street, from Erie to Germantown avenue	6	1,198
Green street, from Tulpehocken to Washington lane	6	450
Green street, from southeast house line of Johnson to 90 ft. 6 inches northwest of northwest house line of Norton	6	492

Street.	Location.	Size in inches.	Distance in feet.
	Service mains—Continued.		
Green street, from 57 feet southeast of northwest house line of Upsal, northwest		6	60
Green street, from Roberts avenue, northwest		6	511
Hancock street, from Herman to dead end southeast house line of Pastorius		6	190
Hancock street, from Pomona to Duval		6	261
High street, from dead end 430 feet northeast of northeast house line of Cedar lane, northeast		6	377
Howard street, from Germantown avenue to Sixteenth		6	727
Itschner street, from 9 feet west of east house line of Twentieth, west		6	16
Jefferson street, from southeast to northwest house line of Upsal		6	82
Kenderton street, from north house line of Tioga to Venango		6	504
Locust avenue, from Bloyd to Bockius		6	829
Magnolia street, from 17 feet southeast of northwest house line of Woodbine to 13 feet northwest of southeast house line of Chelten avenue		6	233
McFerran street, from Germantown avenue to Broad street		6	403
Miller street, from southeast house line of Wisteria, northwest		6	25
Morris street, from Manheim to Hansberry		6	694
Musgrove street, from southeast house line of Tulpehocken, northwest		6	50
Nicetown lane, from Cottage to Wissahickon avenue		12	1,229
Nineteenth street, from Tioga to Venango		6	551
Norton street, from southwest house line of Green street, northeast		6	50
Penn street, from lower to upper Baird		6	43
Penn street, from 37 feet 4 inches southwest of northeast house line of Wayne, northeast		6	37
Pike street, from Fifteenth, west		6	25
Price street, from 1 foot southwest of northeast house line of Engle to northeast house line of Willow avenue		6	225
Pulaski avenue, from dead end 54 feet southeast of southeast house line of Hansberry, northwest		6	79
Pulaski avenue, from 20 feet southeast of northwest house line of Earlham, northwest		6	16
Rockland street, from 25 feet east of centre of York road to Broad		6	231
Roberts avenue, from Green to Germantown avenue		6	178
Rubicam avenue, from Wisteria, northwest to dead end		6	26
Rural avenue, from 20 feet southeast of northwest house line of Allen's lane, northwest		6	20
Seventeenth street, from Erie avenue to 11 feet 7 inches north of south house line of Pulaski avenue		6	403

Street.	Location.	Size in inches.	Distance in feet.
	Service mains—Continued.		
Stafford street.	from 393 feet southwest of southwest house line of Morris, northeast	6	417
Springfield street,	from Twenty-eighth to Germantown avenue	6	571
Tacona street,	from 2 feet southeast of northwest house line of Seymour to Manheim	6	493
Twentieth street,	from north curb line of Allegheny avenue to Westmoreland	6	570
Twenty-eighth street,	from 25 feet southeast of centre of Willowgrove avenue, northwest	6	50
Twenty-ninth street,	from 25 feet southeast of centre of Willowgrove, northwest	6	50
Twenty-third street,	from south house line of Venango, north	6	25
Twenty-second street,	from dead end 119 feet 6 inches south of south house line of Tioga, north	6	147
Twenty-seventh street,	from 25 feet southeast of centre of Willowgrove, northwest	6	50
Tulpehocken street,	from dead end 380 feet southwest of southwest house line of Musgrove, northeast	6	430
Venango street,	from 5 feet 6 inches east of east house line of Broad street, west	6	119
Walnut lane,	from dead end 200 feet 8 inches southwest of southwest house line of Musgrove to Chew	6	975
Washington lane,	from southwest house line of Green, northeast	6	25
Washington lane,	from dead end 393 feet northeast of northeast house line of Adams street, northeast	6	36
Wayne street,	from Apsley, northwest	6	381
Westmoreland street,	from 11 feet 3 inches west of east house line of Broad, west	6	26
Westmoreland street,	from 37 feet east of west house line of Broad street, west	6	37
Westmoreland street,	from east to west house line of Fifteenth street	6	51
Westmoreland street,	from Seventeenth to Germantown Branch of Philadelphia and Reading Railroad	6	771
Willow avenue,	from south east house line of Price, northwest	6	25
Willowgrove avenue,	from Seminole to Germantown ave.	6	1,796
Wisteria avenue,	from Miller to Rubicam	6	290
Woodbine street,	from 17 feet northeast of southwest house line of Magnolia, northeast	6	8
Woodbine avenue,	from Boyer to Sprague	6	699
Wyndmoor street,	from Stenton avenue to southwest house line of Ardmore	6	1,244
	Total	.....	26,857

Street. Location.	Size in inches.	Distance in feet.
Supply main connections.		
Nicetown lane and Pacific street, between 12 inch and 6 inch mains on Nicetown lane	6	38
Pulaski avenue and Manheim street, between 12 inch and 6 inch mains on Manheim	6	15
Tulpehocken street and Germantown avenue between 16 inch service main on southwest side and 16 inch supply main on northeast side of Germantown avenue	16	11
Tulpehocken and Green streets, between 16 inch main on northeast side of Green and 10 inch main on southeast side of Tulpehocken street	16	23
Total		87
Bye-pass connections.		
Green and Harvey streets, between 12 inch main on Green, and 10 inch main on Harvey	10	15
Johnson and Green streets, between 6 inch main on Johnson and 16 inch main on Green street	6	36
Total		51
Fire hydrant connections	6	1,111
Supply connections (private.)		
Cumberland street, northeast side, 192 feet 6 inches southeast of southeast house line of Armat, for Germantown Electric Light Company	4	26
Pipe relaid.		
Chestnut Hill Pump Station in front of coal sheds (drain)	10	31
Chew street, from Penn to Mill	6	988
Germantown avenue, from 29 feet 4 inches southeast of northwest house line of Harvey to 35 feet southeast of southeast house line of Pastorius	18	1,011
Germantown avenue, from 35 feet southeast of southeast house line of Pastorius to 13 feet 9 inches northwest of southeast house line of Tulpehocken	16	223
Germantown avenue, from 13 feet inches 9 northwest of southeast house line of Tulpehocken, northwest	10	8
Harvey street, from southwest house line of Wayne to Germantown avenue	10	2,421

Street.	Location.	Size in inches.	Distance in feet.
	Pipe relaid—Continued.		
Herman street,	from Germantown avenue to Morton	6	1,744
Locust avenue,	from southwest house line of Chew, northeast	6	18
Magnolia street,	from southeast house line of Woodbine, northwest	6	33
Mill street,	from dead end 4 feet 8 inches southwest of centre of Chew, northeast, to connect	4	5
Osceola street,	from Herman, northwest	6	10
Penn street,	from Wayne to Knox	6	498
Price street,	from Hancock to 29 feet northeast of southwest house line of Engle	6	594
Pulaski street,	from Manheim, northwest	6	599
Tulpehocken street,	from Morton, northeast	6	883
Venango street,	from Twenty-third to Wissahickon avenue	12	111
Walnut lane,	from northeast house line of Morton, northeast	6	60
Walnut Lane	from 263 feet southwest of southwest house line of Musgrove, northeast	6	60
Wakefield street,	from Wister to Penn	6	1,463
Wissahickon avenue,	from Venango to Nicetown Lane	12	143
Woodbine street,	from 10 feet northeast of southwest house line of Magnolia, northeast	6	7
	Total		10,910
Fire Hydrant connections relaid		6	401
Repairs, general		3	8
" "		4	3
" "		6	193
" "		10	28
" "		12	22
	Total		254
	Pipe taken up.		
Franklin street,	from 248 feet southwest of southwest house line of Germantown avenue, northeast	4	218
Germantown avenue,	from 33 feet southeast of northwest house line of Harvey, northwest	6	96
Germantown avenue,	from southeast house line of West Walnut lane, northwest	6	287
Germantown avenue,	from 13 feet 6 inches northwest of southeast house line of Tulpehocken, northwest	10	10

Street.	Location.	Size in inches.	Distance in feet.
	Pipe taken up—Continued.		
Harvey street, from southwest to northeast house line of Wayne		6	77
Locust avenue, from southwest house line of Chew, northeast		4	18
Osceola street, from Herman, northwest		4	10
Venango street, from Twenty-third to Wissahickon avenue		6	111
Walnut lane, from northeast house line of Morton, northeast		3	60
Walnut lane, from 263 feet southwest of southwest house line of Musgrove, northeast		4	60
Wissahickon avenue, from Venango to Nicetown lane		6	144
Total			1,091
Fire hydrant connections taken up		3	6
" " "		4	324
" " "		6	5
Total			335
	Pipe lowered.		
Mount Pleasant avenue, from 185 feet southwest of southwest house line of Chew, northeast		6	756
Pulaski avenue, from 181 feet 9 inches northwest of northwest house line of Chelten avenue northwest 63 feet, thence northeast 24 feet		4	87
Union avenue, from northeast house line of Twenty-ninth to Millman		6	277
Total			1,120
	Pipe cut off and abandoned.		
Chew street, from Penn to Mill		3	1,100
Germantown avenue, from 63 feet northwest of northwest house line of Harvey, northwest		6	419
Germantown avenue, from 287 feet northwest of southeast house line of West Walnut lane, northwest		6	436
Harvey street, from northeast house line of Wayne to Germantown avenue		4	2,406
Herman street, from Germantown avenue to Morton		4	1,754
Magnolia street, from southeast house line of Woodbine, northwest		3	33

Street.	Location.	Size in inches.	Distance in feet.
Pipe cut off and abandoned—Continued.			
Penn street,	from Wayne to Knox	4	478
Price street,	from Hancock to 29 feet northeast of southwest house line of Engle	4	594
Pulaski street,	from Manheim, northwest	3	604
Tulpehocken street,	from Morton, northeast	3	1,190
Wakefield street,	from Wister to Penn	4	1,483
Total...			10,497
Fire hydrant connections cut off and abandoned		4	19

Recapitulation of Sixth District.

	Purposes for which used.	Sizes—Inches.							Totals in feet and pounds.
		3	4	6	10	12	16	18	
New pipe or feet added.	Service mains			25,199	429	1,229			26,857
	Supply main connections			53			34		87
	Bye pass connections			36	15				51
	Fire hydrant connections			1,111					1,111
	Supply connections (private)		26						26
	Total ..... Feet		26	26,399	444	1,229	34		28,132
	Total ..... Pounds		494	871,167	24,420	88,488	3,740		988,309
Pipe used, but adding nothing to feet in ground.	Pipe relaid		5	7,358	2,460	254	223	1,011	11,311
	Repairs general	8	3	193	28	22			254
	Pipe taken up	66	630	720	10				1,426
	Pipe lowered		87	1,033					1,120
	Total ..... Feet	74	725	9,304	2,498	276	223	1,011	14,111
	Total ..... Pounds	1,110	13,775	307,032	137,390	19,872	24,530	141,540	645,249
	Total handled ..... Feet	74	751	35,703	2,942	1,505	257	1,011	42,243
	Total handled ..... Pounds	1,110	14,269	1,178,199	161,810	108,360	28,270	141,540	1,633,558
	Pipe cut off and abandoned	2,927	6,734	855					10,516

Recapitulation of Work on the Water Pipes.

Purposes for which used.		Sizes—Inches. 3	4	6	8	10	12	16	18	20	26	30	36	48	Total in feet and pounds.
New pipe or feet added.	Service mains			119,042	1,215	608	4,818								125,683
	Supply mains						6,440						67	13,374	19,881
	Pumping mains													1,698	1,698
	Service main connections			424		42									466
	Supply main connections			60		61		34		57		15	211	12	450
	Pumping main connections									83	13	6			102
	Bye-pass connections			96		15									111
	Fire-hydrant connections			8,680											8,680
	Fire connections (private)	15	124	35	13										187
	Supply connections (private	67	244	239											550
	Motor connections (private)		8												8
	Drains		911	445		4									1,360
Total.	feet	82	1,287	129,021	1,228	730	11,258	34		140	13	21	278	15,084	159,176
	pounds	1,230	24,453	4,257,693	51,576	40,150	810,576	3,740		22,260	4,199	6,972	117,316	8,824,140	14,164,305
Pipe used but adding nothing to feet in ground	Pipe relaid		5	29,100		2,563	254	223	1,011				86		33,242
	Repairs, general	220	874	4,577	28	494	221	17		40		38	72	9	6,590
	Pipe taken up	3,886	4,642	12,345		10			2,864	104			578		24,429
	Pipe lowered		130	5,315			396			220					6,061
	Pipe raised			199											199
	Pipe shifted			25											25
Total.	feet	4,106	5,651	51,561	28	3,067	871	240	3,875	364		38	736	9	70,546
	pounds	61,590	170,369	1,701,513	1,176	168,685	62,712	26,400	542,500	57,876		12,616	310,592	5,265	3,058,294
Total handled.	feet	4,188	6,938	180,582	1,256	3,797	12,129	274	3,875	504	13	59	1,014	15,093	229,722
	pounds	64,820	131,822	5,959,206	52,752	208,835	873,288	30,140	542,500	80,136	4,199	19,588	427,908	8,829,405	17,222,599
Pipe cut off and abandoned		3,360	8,763	2,221					192	48					14,584

RECAPITULATION BY DISTRICTS.

	Districts.	Sizes—Inches.													Totals.	
		3	4	6	8	10	12	16	18	20	26	30	36	48	Feet.	Pounds.
New pipe or feet added.	First	.....	534	17,144	1,215	.....	879	.....	.....	.....	.....	.....	.....	.....	19,772	690,216
	Second	15	50	27,930	.....	.....	1,795	.....	.....	.....	.....	.....	.....	.....	29,790	1,052,105
	Third	.....	55	22,282	.....	61	.....	.....	.....	57	.....	.....	108	2,187	24,750	2 073,740
	Fourth	67	514	27,829	13	86	.....	.....	.....	83	13	21	170	12,897	41,693	8,575,257
	Fifth	.....	108	7,437	.....	139	7,355	.....	.....	.....	.....	.....	.....	.....	15,039	784,678
	Sixth	.....	26	26,399	.....	444	1,229	34	.....	.....	.....	.....	.....	.....	28,132	988,309
	Total Feet	82	1,287	129,021	1,228	730	11,258	34	.....	140	13	21	278	15,084	159,176	.....
	Total Pounds	1,230	24,453	4,257,693	51,576	40,150	810,576	3,740	.....	22,260	4,199	6,972	117,316	8,824,140	.....	14,164,305
Pipe used, but adding nothing to feet in ground.	First	1,935	704	4,059	.....	30	.....	11	.....	.....	.....	.....	.....	.....	6,739	179,208
	Second	1,758	1,359	4,854	13	114	84	6	.....	.....	.....	13	.....	.....	8,201	230,213
	Third	126	1,184	27,183	4	89	6	.....	2,864	21	.....	13	736	.....	32,226	1,646,127
	Fourth	213	1,521	3.945	11	324	505	.....	.....	19	.....	12	.....	9	6,559	229,191
	Fifth	.....	158	2,216	.....	12	.....	.....	.....	324	.....	.....	.....	.....	2,710	128,306
	Sixth	74	725	9,304	.....	2,498	276	223	1,011	.....	.....	.....	.....	.....	14,111	645,249
	Total Feet	4,106	5,651	51,561	28	3,067	871	240	3,875	364	.....	38	736	9	70,546	.....
	Total Pounds	61,590	107,369	1,701,513	1,176	168,685	62,712	26,400	542,500	57,876	.....	12,616	310,592	5,265	.....	3,058,294
Total handled	Feet	4,188	6,938	180,582	1,256	3,797	12,129	274	3,875	504	13	59	1,014	15,093	229,722	.....
	Pounds	62,820	131,822	5,959,206	52,752	208,835	873,288	30,140	542,500	80,136	4,199	19,588	427,908	8,829,405	.....	17,222,599
Pipe cut off and abandoned		3,360	8,763	2,221	.....	.....	.....	.....	192	48	.....	.....	.....	.....	14,584	

NEW FIRE HYDRANTS.

First District.

Street.	Location.	Ward.	Size of main in inches.	6-Inch Connection.		Style.			
				Feet.	In.	O. S.	No. 1.	No. 2.	No. 3.
Afton street, south side, east house line of Seventeenth		26	4	9	6	.....	1		
Afton street, south side, west house line of Seventeenth		26	4	9	6	.....	1		
Bancroft street, west side, south house line of Moore		26	6	8	6	.....	1		
Bangor street, north side, 239 feet west of west house line of Lloyd		30	6	8	6	.....	1		
Catharine street, north side, east house line of Fifteenth		30	6	15	.....	.....	.....	1	
Catharine street, north side, east house line of Sixteenth		30	6	15	.....	.....	.....	1	
Catharine street, south side, 33 feet west of west house line of Twenty-second		30	6	15	.....	.....	.....	1	
Carpenter street, north side, east house line of Broad		2	6	15	6	.....	.....	1	
Carpenter street, north side, east house line of Sixteenth		30	6	15	.....	.....	.....	1	
Chadwick street, west side, south house line of Moore		26	6	8	6	.....			
Charles street, west side, 155 feet south of south house line of Washington avenue		2	6	5	.....	.....	1		
Charles street, west side, south house line of Moss		2	6	5	.....	.....	.....	1	
Clement street, west side, south house line of Carpenter		30	6	10	6	.....	.....	1	
Daly street, south side, 154 feet east of east house line of Fourth		1	6	8	.....	.....	1		
Daly street, south side, 200 feet east of east house line of Fifth		1	6	8	.....	.....	1		

New Fire Hydrants—First District—*Continued.*

Street.	Location.	Ward.	Size of main in inches.	6-Inch Connection.		Style.			
				Feet.	I.	O. S.	No. 1.	No. 2.	No. 3.
Daly street, south side, 150 feet east of east house line of Tenth		1	6	7	6	.....	1	.....	
Dickinson street, north side, east house line of Second		1	6	14	6	.....	.....	1	
Dickinson street, north side, west house line of Twenty-second		26	6	14	6	.....	.....	1	
Dudley street, north side, 69 feet east of east house line of Front		1	6	6	6	.....	1	.....	
Eighteenth street, east side, south house line of Wolf		26	6	15	.....	.....	.....	1	
Emily street, south side, 133 feet east of southeast house line of Moyamensing ave		1	6	8	.....	.....	1		
Emily street, north side, 321 feet west of west house line of Tenth		1	6	7	6	.....	1	.....	
Federal street, south side, 49 feet west of west house line of Fifth		2	8	7	6	.....	.....	1	
Federal street, south side, 172 feet east of east house line of Seventh		2	8	7	6	.....	1	.....	
Federal street, north side, east house line of Fifteenth		26	6	15	6	.....	.....	1	
Federal street, north side, east house line of Sixteenth		26	6	15	6	.....	.....	1	
Federal street, north side, west house line of Seventeenth		26	6	14	6	.....	.....	1	
Federal street, north side, west house line of Twenty-first		26	6	15	.....	.....	.....	1	
Federal street, north side, east house line of Twenty-second		26	6	15	.....	.....	.....	1	
Federal street, north side, west house line of Twenty-seventh		26	6	15	.....	.....	.....	1	
Federal street, south side, 17 feet east of east house line of Twenty-eighth		26	6	15	.....	.....	.....	1	

NEW FIRE HYDRANTS—FIRST DISTRICT—*Continued.*

Street.	Location.	Ward.	Size of main in inches.	6-INCH CONNECTION.		STYLE.			
				Feet.	In.	O. S.	No. 1.	No. 2.	No. 3.
Fernon street, south side, 95 feet east of east house line of Sixth		26	6	7	6	.....	1		
Fernon street, north side, east house line of Twenty-second		26	6	9	.....	.....	1		
Fifth street, east side, north house line of Wolf		1	6	14	6	.....	.....	1	
Fourth street, east side, 5 feet south of south house line of McKean			6	21	.....	.....	.....	1	
Front street, west side, north house line of McKean		1	6	16	6	.....	.....	1	
Fifth street, west side, 13 feet south of south house line of Argyle		1	6	15	.....	.....	.....	1	
Hancock street, west side, 195 feet south of south house line of Snyder avenue		1	6	8	.....	.....	1		
Hancock street, west side, 69 feet south of south house line of McKean		1	6	8	.....	.....	1		
Jackson street, north side, east house line of Old Second		1	6	16	.....	.....	.....	1	
Jackson street, south side, east house line of Fifth		1	6	16	.....	.....	.....	1	
Jackson street, south side, 139 feet west of west house line of Twelfth		1	6	17	3	.....	.....	1	
Juniper street, west side, 137 feet south of south house line of Mifflin		26	6	8	6	.....	1		
Long Lane, southeast side, 178 feet southwest of south house line of Federal		26	6	12	.....	.....	1		
Marriot street, north side, west house line of Sixth		2	6	5	6	.....	1		
McKean street, south side, east house line of East Second		1	6	14	.....	.....	.....	1	
McKean street, north side, west house line of East Second		1	6	14	6	.....	.....	1	

New Fire Hydrants—First District—*Continued.*

Street.	Location.	Ward.	Size of main in inches.	6-Inch Connection.		Style.			
				Feet.	In.	O. S.	No. 1.	No. 2.	No. 3.
McNeil avenue, east side, 198 feet 6 inches north of north house line of Mifflin		26	6	8	6	.....	1		
Mercy street, north side, 139 feet east of southeast house line of Moyamensing avenue		26	6	7	6	.....	1		
Mountain street, north side, 79 feet east of east house line of Nineteenth		26	6	8	.....	.....	1		
Mountain street, north side, east house line of Twenty-second		26	6	9	.....	.....	1		
Morris street, south side, 62 feet 6 inches west of west house line of Eighth		1	6	15	.....	.....	1		
Nineteenth street, east side, south house line of Catharine		30	6	14	6	.....	.....	1	
Nineteenth street, west side, south house line of Moore		26	12	15	.....	.....	.....	1	
Otsego street, west side, 212 feet north of north house line of Reed		1	6	15	.....	.....	1		
Pallas street, west side, on dead end of 4 inch pipe 318 feet 6 inches north of north house line of Tasker		26	6	8	6	.....	1		
Passyunk avenue, southeast side, 50 feet southwest of south house line of Christian		2	6	18	.....	.....	.....	1	
Pierce street, north side, east house line of Eighteenth		26	6	10	.....	.....	1		
Queen street, north side, east house line of Third		3	6	14	6	.....	.....	1	
Queen street, north side, east house line of Fourth		3	6	14	6	.....	.....	1	
Queen street, south side, west house line of Fifth		3	6	14	6	.....	.....	1	
Reed street, south side, 178 feet east of east house line of Ninth		1	6	15	.....	.....	.....	1	
Reese street, east side, 48 feet south of south house line of Argyle		26	6	7	6	.....	1		

New Fire Hydrants—First District—*Continued.*

Street.	Location.	Ward.	Size of main in inches.	6-Inch Connection.		Style.			
				Feet.	In.	O. S.	No. 1.	No. 2.	No. 3.
Second street, east side, south house line of Wharton		1	6	15				1	
Sixteenth street, west side, south house line of South		30	6	15				1	
Sixteenth street, west side, 123 feet north of north house line of Catharine		30	6	15			1		
Snyder avenue, north side, 111 feet east of east house line of Fifth		1	6	8	6			1	
South street, north side, west house line of Third		5	10	8	6			1	
South street, north side, 2 feet east of east house line of Fifteenth		7	6	15	6			1	
South street, north side, west house line of Twenty-third		7	6	15				1	
Tasker street, north side, east house line of Fourth		1	6	15				1	
Thirty-sixth street, west side, south house line of Wharton		26	6	14	6			1	
Tree street, north side, 206 feet east of east house line of Fourth		1	6	7	6		1		
Tree street, south side, 155 feet east of east house line of Fifth		1	6	8			1		
Tree street, south side, 136 feet east of east house line of Tenth		1	6	7	6		1		
Tree street, north side, 215 feet east of east house line of Thirteenth		1	6	8	6		1		
Twelfth and Wharton, in 1st District Yard, Bureau of Water		26	4				1		
Twentieth street, west side, 162 feet south of south house line of Federal		26	6	16			1		
Twentieth street, west side, 98 feet south of south house line of Federal		26	6	16			1		

New Fire Hydrants—First District—*Continued.*

Street.	Location.	Ward.	Size of main in inches.	6-Inch Connection.		Style.			
				Feet.	In.	O. S.	No. 1.	No. 2.	No. 3.
Washington avenue, south side, west house line of Third		2	6	13	6	.....	.....	1	
Washington avenue, south side, west house line of Thirteenth		2	6	10	.....	.....	.....	1	
Watkins street, north side, 168 feet east of east house line of Eleventh		1	4	7	.....	.....	1		
Watkins street, north side, 99 feet east of east house line of Eighteenth		26	6	9	6	.....	1		
Wharton street, south side, 137 feet east of east house line of Twelfth, in 1st Dist. Yard, Bureau of Water		26	6	63	.....	.....	.....	.....	1
Wharton street, south side, west house line of Thirty-sixth		26	6	14	6	.....	.....	1	
Winton street, south side, 99 feet east of east house line of Tenth		1	4	8	6	.....	1		
Young street, 269 feet south of south house line of Wolf		1	6	8	6	.....	1		
Total				968	9		41	45	1

New Fire Hydrants—Continued.

Second District.

Street.	Location.	Ward.	Size of main in inches.	6-Inch Connection.		Style.			
				Feet.	In.	O. S.	No. 1.	No. 2.	No. 3.
Belmont Pumping Station, north corner of engine house		24	30	51	7	.....	1		
Chancellor street, south side, 2 feet west of west house line of Sixteenth		8	6	12	.....	.....	.....	1	
Chancellor street, south side, 150 feet west of west house line of Thirty-second		27	6	8	2	.....	.....	1	
Cherry street, No. 918, in 2d District yard, Bureau of Water		10	4	29	.....	.....	1		
Cherry street, south side, 5 feet east of east house line of Eleventh		10	6	12	.....	.....	.....	1	
Cherry street, south side, 124 feet east of east house line of Twelfth		10	6	10	9½	.....	.....	1	
Chestnut street, south side, 7 feet east of east house line of Twenty-third		8	10	15	.....	.....	.....	1	
Dean street, east side, 1 foot south of south house line of Arizona		8	6	4	10	.....	.....	1	
Dean street, west side, north house line of Lyndall alley		8	6	4	6	.....	.....	1	
Eighth street, west side, 3 feet 6 inches south of south house line of Walnut		8	10	8	.....	.....	.....	1	
Eighth street, east side, 293 feet south of south house line of Vine		10	10	14	.....	.....	.....	1	
Eleventh street, east side south house line of Sansom		8	10	14	.....	.....	.....	1	
Exeter street, south side, 160 feet east of east house line of Seventeenth		8	6	3	9	.....	.....	1	
Fifteenth street, west side, 116 feet 6 inches north of north house line of Thompson		34	6	13	6	.....	.....	1	
Fifteenth street, east side, north house line of Master		34	6	13	6	.....	.....	1	

New Fire Hydrants—Second District—*Continued.*

Street.	Location.	Ward.	Size of main in inches.	6-Inch Connection.		Style.			
				Feet.	In.	O. S.	No. 1.	No. 2.	No. 3.
Fifty-eighth street, east side, 138 feet southeast of southeast house line of Gibson avenue		27	6	21	6	.....	.....	1	
Fifty-eighth street, west side, north house line of Elmwood avenue		27	6	21	6	.....	.....	1	
Fifty-eighth street, west side, 667 feet south of south house line of Woodland avenue		27	6	21	9	.....	.....	1	
Fifty-fifth street, east side, 3 feet south of southwest house line of Lancaster avenue		34	6	14	.....	.....	.....	1	
Fifty-first street, west side, north house line of Willow avenue		27	6	21	.....	.....	.....	1	
Fifty-first street, east side, 307 feet south of south house line of Florence avenue		27	6	21	.....	.....	1		
Fifty-first street, west side, 75 feet north of north house line of Pennsgrove		24	6	19	.....	.....	1		
Fifty-first street, west side north house line of Florence avenue		27	6	21	.....	.....	.....	1	
Fifty-first street, west side, 16 feet south of south house line of Warren		34	6	17	6	.....	1		
Fifty-first street, west side, 3 feet south of south house line of Lancaster avenue		34	6	13	6	.....	.....	1	
Fifty-fourth street, west side, 35 feet north of north house line of Haverford avenue		34	6	18	.....	.....	.....	1	
Fifty-fourth street, west side, 134 feet north of north house line of Westminster avenue		34	6	18	.....	.....	.....	1	
Fifty-fourth street, east side, 274 feet south of south house line of Girard avenue		34	6	18	.....	.....	1		
Fifty-fourth street, west side, south house line of Thompson		34	6	18	.....	.....	.....	1	
Fifty-fourth street, west side, 4 feet south of south house line of Lansdowne avenue		34	6	5	6				
Fifty-second street, east side, 19 feet south of south house line of Lancaster avenue		34	6	25	8	.....	.....	1	

NEW FIRE HYDRANTS—SECOND DISTRICT—*Continued.*

Location.	Ward.	Size of main in inches.	6-Inch Connection.		Style.			
			Feet.	In.	O. S.	No. 1.	No. 2.	No. 3.
Fifty-sixth street, east side, 2 feet south of south house line of Market	27	6	15				1	
Forty-eighth street, east side, opposite Sherborne or Regent	27	6	22	6			1	
Forty-eighth street, west side, 4 feet south of south house line of Wyalusing avenue	34	6	22	6			1	
Forty-eighth street, west side, 7 feet north of north house line of Seneca	34	6	23				1	
Forty-eight-and-one-half street, west side, 7 feet 6 inches north of north house line Pashall avenue	27	6	9			1		
Forty-fifth street, west side, 3 feet south of south house line of Kingsessing avenue	27	12	21				1	
Forty-fifth street, west side, 3 feet south of south house line of Chester avenue	27	12	21				1	
Forty-fifth street, west side, 3 feet south of south house line of Springfield avenue	27	12	21				1	
Forty-ninth street, west side, 3 feet south of south house line of Fairmount avenue	34	6	18				1	
Forty-seventh street, west side, 360 feet north of north house line of Gray's Ferry Road	27	6	21				1	
Forty-three-and-one-half street, west side, 4 feet 6 inches south of south house line of Mantua avenue	24	6	6				1	
Fourth street, east side, 74 feet north of north house line of Branch	6	6	14				1	
Front street, west side, 264 feet north of north house line of Race	6	8	16				1	
Girard avenue, north side, 2 feet east of east house line of Fifty-third street	34	6	21				1	
Girard avenue, north side east house line of Fifty-fourth street	34	6	21				1	
Gray's Ferry Road, southwest side, 47 feet northwest of west house line of Forty-seventh street	27	6	18				1	

New Fire Hydrants—Second District—*Continued.*

Street.	Location.	Ward.	Size of main in inches.	6-Inch Connection.		Style.			
				Feet.	In.	O. S.	No 1.	No. 2.	No. 3.
Hanson street, south side, 3 feet east of east house line of Forty-ninth		27	6	10	6			1	
Lansdowne avenue, north side, 203 feet west of west house line of Conestoga		34	6	5	6			1	
Lansdowne avenue, north side, 2 feet 6 inches west of west house line of Fifty-sixth		34	6	18				1	
Lansdowne avenue, south side, 2 feet 6 inches west of west house line of Fifty-seventh street		34	6	18				1	
Lansdowne avenue, north side, 2 feet 6 inches west of west house line of Fifty-eighth street		34	6	18				1	
Lansdowne avenue, north side, 2 feet 6 inches west of west house line of Fifty-ninth street		34	6	18				1	
Landsowne avenue, south side west house line of Sixtieth street		34	6	18				1	
Lee avenue, north side, west house line of Sixtieth street		34	6	14				1	
Lombard street, south side, 176 feet east of east house line of Ninth		7	6	14				1	
Ludlow street, north side, 327 feet 6 inches east of east house line of Fifty-sixth		27	6	11			1		
Manley street, north side east house line of Conestoga		34	6	8			1		
Marston street, north side, 2 feet 6 inches west of west house line of Meadland avenue		27	6	13	6		1		
Marston street, north side, 162 feet east of east house line of Thirty-third		27	6	13	6			1	
Melon street, south side, 162 feet 6 inches west of west house line of Thirty-third street		24	6	8	6			1	
Morrell street, north side east house line of Conestoga		34	6	8	2		1		
Otter street, north side, 5 feet 6 inches west of west house line of Forty-second		24	6	11			1		

New Fire Hydrants—Second District—*Continued.*

Street.	Location.	Ward.	Size of main in inches.	6-Inch Connection.		Style.			
				Feet.	In.	O. S.	No. 1.	No. 2.	No. 3.
Parrish street, south side, 2 feet west of southwest house line of Mantua avenue		24	6	14			1		
Pennsgrove street, north side, 5 feet east of east house line of Forty-fourth		24	6	11			1		
Preston street, east side, south house line of Brown		24	6	14				1	
Reno street, south side, 275 feet west of west house line of Thirty-eighth		24	6	9				1	
Sansom street, north side, 123 feet east of east house line of Thirty-seventh		27	6	10	8		1		
Second street, west side, 110 feet south of south house line of Quarry		6	6	14				1	
Second street, east side, 142 feet south of south house line of New		6	6	14				1	
Seventeenth street, west side, 35 feet north of north house line of Sansom		8	6	14	5			1	
Sixteenth street, east side, opposite centre of Helmuth		7	6	14				1	
Sixteenth street, west side, 16 feet north of centre of Rundle		7	6	14				1	
Sixty-first street, east side, south house line of Paschall		34	6	18	6			1	
South street, north side, 60 feet east of east house line of sixty-first		27	6	23	6			1	
State street, west side, 3 feet north of north house line of Poplar		24	6	7	6		1		
Tenth street, west side, south house line of Sansom		8	6	8				1	
Thirteenth street, east side, 131 feet south of south house line of Locust		8	6	14			1		
Thirty-fifth street, west side, north house line of Spring Garden		24	12	7	2			1	

New Fire Hydrants—Second District—*Continued.*

Street.	Location.	Ward.	Size of main in inches.	6-Inch Connection.		Style.			
				Feet.	In.	O. S.	No. 1.	No. 2.	No. 3.
Thirty-first street, west side, 7 feet south of south house line of Baring		24	6	17	6	.....	.....	1	
Thirty-fourth street, west side, south house line of Mantua avenue		24	6	26	1	.....	.....	1	
Thirty-ninth street, west side, 1 foot south of south house line of Woodland avenue		27	6	19	.....	.....	.....	1	
Thirty-ninth street, east side, 4 feet north of north house line of Spring Garden		24	6	16	.....	.....	.....	1	
Thirty-ninth street, east side, south house line of Wallace		24	6	13	.....	.....	.....	1	
Twentieth street, west side, 1 foot north of north house line of Chestnut		9	6	9	.....	.....	.....	1	
Twentieth street, east side, 1 foot south of south house line of Race		10	6	14	.....	.....	.....	1	
Twenty-second street, west side, 4 feet north of north house line of Chestnut		9	12	17	6	.....	.....	1	
Union street, west side, 3 feet north of north house line of Poplar		24	6	7	6	.....	1		
Walnut street, south side, 8 feet 11 inches west of west house line of Fourth		5	12	8	6	.....	.....	1	
Westminster street, south side, 5 feet 6 inches east of east house line of Market		34	12	17	.....	.....	.....	1	
Total		.....	.....	1,380	0½	.....	18	72	

New Fire Hydrants—Continued.

Third District.

Street.	Location.	Ward.	Size of main in inches.	6-Inch Connection.		Style.			
				Feet.	In.	O. S.	No. 1.	No. 2.	No. 3.
Adelena street, south side, 221 feet east of east house line of Emerald		25	6	10	10	.....	1		
Allen street, west side, 153 feet 2 inches north of north house line of Marlborough		18	4	11	9	.....	1		
American street, east side, north house line of Oxford		17	4	9	6	.....	.....	1	
Ann street, north side, west house line of Gaul		31	6	15	.....	.....	1		
Airdrie street, north side, west house line of Lawrence		33	6	9	7	.....	.....	1	
Bath street, west side, north house line of William		25	4	13	9	.....	.....	1	
Berks street, north side, east house line of Palethorp		19	6	14	4	.....	.....	1	
Bowers street, southwest corner of Waterloo		19	6	10	4	.....	.....	1	
Bridge street, northeast side, 3 feet 6 inches southeast of southeast house line of Trenton avenue		23	6	16	.....	.....	.....	1	
Callowhill street, south side, 89 feet 6 inches east of east house line of Fourth		11	10	15	7	.....	.....	1	
Cambria street, northwest side, southeast house line of Frankford avenue		25	4	19	6	.....	.....	1	
Cambria street, south side, west house line of Howard		33	6	14	8	.....	.....	1	
Cambria street, south side, east house line of Mascher		33	6	14	8	.....	.....	1	
Cambria street, north side, west house line of Hancock		33	6	14	9	.....	.....	1	
Cambria street, south side, east house line of Second		33	6	15	.....	.....	.....	1	

New Fire Hydrants—Third District—*Continued.*

Street. Location.	Ward.	Size of main in inches.	6-Inch Connection.		Style.			
			Feet.	In.	O. S.	No. 1.	No. 2.	No. 3.
Cambria street, south side, east house line of Eighth	33	6	14	7	.....	.....	1	
Cambria street, north side, east house line of Germantown avenue	33	6	14	7	.....	.....	1	
Canal street, northwest side, opposite north house line of Pollard	16	6	11	6	.....	.....	1	
Canal street, northwest side, 8 feet southwest of southwest house line of Germantown avenue	16	6	15	2	.....	.....	1	
Carey street, north side, west house line of Lawrence	33	6	9	1	.....	.....	1	
Chatham street, west side, 464 feet south of south house line of Clearfield	25	6	10	9	.....	1		
Catham street, west side, north house line of Ann	25	6	10	6	.....	.....	1	
Clairborn street, west side, 141 feet south of south house line of Ball	18	6	11	4	.....	1		
Columbia street, south side, east house line of Howard	19	6	14	6	.....	.....	1	
Coral street, southeast side, 100 feet southwest of south house line of Somerset	25	6	15	.....	.....	1		
Cumberland street, south side, southeast house line of Kensington avenue	31	6	18	10	.....	.....	1	
Dauphin street, north side, west house line of Gaul	31	6	14	4	.....	.....	1	
Dauphin street, south side, east house line of Second	19	6	14	4	.....	.....	1	
Deal street, south side, 160 feet east of east house line of Harper	23	6	10	8	.....	1		
Deal street, south side, 250 feet west of west house line of Harper	23	6	10	7	.....	1		
Delaware Works, 165 feet south of south house line of Beach	18	6	5	.....	.....	1		

New Fire Hydrants—Third District—*Continued.*

Street.	Location.	Ward.	Size of main in inches.	6-Inch Connection.		Style.			
				Feet.	In.	O. S.	No. 1.	No. 2.	No. 3.
Dillwyn	east side, south house line of Callowhill	11	10	13				1	
Emerald street	southeast side, north house line of Kennedy	25	6	15				1	
Fifth street	west side, 14 feet north of north house line of George	16	6	18	6			1	
Fifth street	west side, north house line of Clearfield	19	6	19	5			1	
Frankford avenue	east side, 4 feet 8 inches south of south house line of Wheat	18	10	19	4			1	
Frankford avenue	southeast side, northeast side of Connecting railroad	25	6	19				1	
Frankford avenue	northwest side, 137 feet 6 inches southwest of south house line of Buckins	25	12	26	2			1	
Germantown avenue	northeast side, 14 feet northwest of west house line of Second	16	6	17	6			1	
Glenwood street	northwest side, east house line of Fairhill	33	6	18	6			1	
Hancock street	west side, north house line of Van Horn	16	6	14	7			1	
Hancock street	west side, south house line of Cumberland	19	6	14	4			1	
Hanover street	northeast side, southwest house line of Thompson	18	6	15				1	
Hanover street	southwest side, 188 feet southeast of southeast house line of Belgrade	18	6	14	6			1	
Hart lane	southwest side, northwest house line of Frankford avenue	25	6	13	10			1	
Hart lane	south side, northwest house line of Emerald	25	6	13	2				1
Holman street	east side, north house line of Susquehanna avenue	31	6	11	6				1

NEW FIRE HYDRANTS—THIRD DISTRICT—*Continued.*

Street. Location.	Ward.	Size of main in inches.	6-INCH CONNECTION.		STYLE.			
			Feet.	In.	O. S.	No. 1.	No. 2.	No. 3.
Hope street, west side, south house line of Thompson	17	4	5				1	
Hope street, east side, south house line of Tioga	33	6	9				1	
Hull street, on dead end of 6-inch pipe 108 feet east of east house line of Third	33	6				1		
Kensington avenue, southeast side, north house line of Hazzard	31	6	8	5			1	
Kensington avenue, southeast side, south house line of Westmoreland	25	6	11	10			1	
Kensington avenue, southeast side, north house line of Ontario	25	6	11				1	
Kensington avenue, west side, 3 feet 6 inches, south of south house line of Hart lane	33	6	11	7			1	
Laurel street, south side, 2 feet east of east house line of Second	16	6	12				1	
Lawrence street, east side, south house line of Jefferson	17	6	14	9			1	
Lawrence street, east side, north house line of Westmoreland	33	6	14	8			1	
Lawrence street, east side, south house line of Ontario	33	6	14	6			1	
Lee street, east side, south house line of Tioga	33	6	11				1	
Lehigh avenue, southwest side, southeast house line of Trenton avenue	31	6	10	9			1	
Lehigh avenue, south side, west house line of Leamy	19	6	10	8			1	
Leithgow street, west side, 120 feet south of south house line of York	19	6	8	5		1		
Linden street, north side, west house line of Tackawana	23	6	16	9			1	

NEW FIRE HYDRANTS—THIRD DISTRICT—*Continued.*

Street. Location.	Ward.	Size of main in inches.	6-INCH CONNECTION.		STYLE.			
			Feet.	In.	O. S.	No. 1.	No. 2.	No. 3.
Linden street, south side, east house line of Mulberry	23	6	16	6			1	
Madison street, north side, west house line of Frankford avenue	25	6	14	8			1	
Marshall street, east side, north house line of Somerset	33	6	14	6			1	
Marshall street, west side, south house line of Indiana avenue	33	6	14				1	
Mascher street, east side, south house line of York	19	6	14	3			1	
Mascher street, west side, north house line of Huntingdon	19	6	15	2			1	
Mascher street, east side, southwest house line of Guernsey	33	6	14	8			1	
Mayfield street, on dead end of 6 inch pipe, 169 feet east of east house line of Third	33	6				1		
Montgomery avenue, southwest side, northwest house line of Tulip	18	6	14	6		1		
Mutter street, west side, 195 feet south of south house line of Indiana avenue	33	6	8	10		1		
Mutter street, west side, south house line of Indiana avenue	33	6	8	8			1	
New Market street, west side, north house line of Wilmer	12	6	17	5			1	
New Market street, east side, north house line of Pollard	16	6	15	10			1	
Norris street, north side, east house line of Fourth	19	6	15	8			1	
Norris street, north side, east house line of Fifth	19	6	14	10			1	
Norris street, south side, southwest house line of Germantown avenue	19	6	14	6			1	

New Fire Hydrants—Third District—*Continued.*

Street.	Location.	Ward.	Size of main in inches.	6-Inch Connection.		Style.			
				Feet.	In.	O. S.	No. 1.	No. 2.	No. 3.
Norris street, south side, east house line of Lawrence		19	6	14	9	.....	1		
Norris street, north side, east house line of Trenton avenue		19	6	12	6	.....	.....	1	
Norris street, north side, east house line of Tulip		31	6	14	5	.....	.....	1	
Norris street, north side, east house line of Hancock		19	6	14	.....	.....	.....	1	
Ontario street, south side, east house line of Fillmore		33	6	14	6	.....	.....	1	
Ontario street, south side, east house line of Lee		33	6	14	6	.....	.....	1	
Ontario street, south side, west house line of Third		33	6	14	6	.....	.....	1	
Ontario street, north side, west house line of Frankford avenue		25	8	17	3	.....	.....	1	
Oriana street, west side, 250 feet north of north house line of Indiana avenue		33	6	8	1	.....	1		
Orkney street, east side, 371 feet south of south house line of Ontario		33	6	9	5	.....	1		
Palethorp street, east side, 41 feet 4 inches, south of south house line of Norris		19	4	8	3	.....	.....	1	
Palethorp street, west side, 182 feet south of south house line of Cambria		33	6	7	2	.....	1		
Palethorp street, west side, 99 feet north of north side of Cambria		33	6	8	7	.....	1		
Paul street, northwest side, northeast house line of Oxford		23	6	10	2	.....	.....	1	
Penn street, southeast side, northeast house line of Sellers		23	6	14	10	.....	.....	1	
Penn street, southeast side, southwest house line of Orthodox		23	6	14	8	.....	.....	1	

NEW FIRE HYDRANTS—THIRD DISTRICT—*Continued.*

Street.	Location.	Ward.	Size of main in inches.	6-INCH CONNECTION.		STYLE.			
				Feet.	In.	O.S.	No. 1.	No. 2.	No. 3.
Philip street, west side,	43 feet 4 inches south of south house line of York	19	4	8	3	..	1		
Philip street, east side,	southeast house line of Glenwood avenue	33	6	8	10	.....	.....	1	
Randolph street, east side,	north house line of Oxford	17	6	13	4	.....	.....	1	
Randolph street, east side,	116 feet south of south house line of Columbia avenue	19	6	12	4	.....	.....	1	
Richmond street, south side,	3 feet 6 inches west of west house line of Frankford avenue	18	6	14	6	.....	.....	1	
Richmond street, north side,	opposite centre of Bristol	25	6	20		.....	.....	1	
Rosehill street, west side,	south house line of Indiana avenue	33	6	16	6	.....	.....	1	
Ruth street, west side,	north house line of Orleans	25	6	14	3	.....	.....	1	
Ruth street, west side,	south house line of Clearfield	25	6	14	4	.....	.....	1	
Rutledge street, west side,	218 feet south of south house line of Indiana avenue	33	6	7	8	.....	1		
St. John street, east side,	southwest house line of Germantown avenue	16	6	11	3	.....	.....	1	
Second street, east side,	50 feet south of south house line of Wilmer	11	6	15	9	.....	.....	1	
Second street, west side,	167 feet north of north house line of Somerset	33	6	18	9	.....	.....	1	
Second street, east side,	239 feet north of north house line of Cambria	33	6	18	2	.....	1		
Second street, east side,	south house line of Indiana avenue	33	6	18	3	.....	.....	1	
Sergeant street, south side,	east house line of Coral	31	6	15		.....	.....	1	

NEW FIRE HYDRANTS—THIRD DISTRICT—*Continued.*

Street.	Location.	Ward.	Size of main in inches.	6-INCH CONNECTION.		STYLE.			
				Feet.	In.	O. S.	No. 1.	No. 2.	No. 3.
Somerset street,	southwest side, northwest house line of Almond	25	6	17				1	
Somerset street,	north side, west house line of Belgrade	25	6	20	10			1	
Somerset street,	south side, 2 feet west of west house line of Tulip	25	6	20	8			1	
Somerset street,	north side, east house line of Amber	25	6	14	10			1	
Somerset street,	south side, east house line of Coral	25	6	13	2			1	
Somerset street,	south side, east house line of Frankford avenue	25	6	20	3			1	
Susquehanna avenue,	southwest side, southeast house line of Richmond	18	6	8				1	
Susquehanna avenue,	southwest side, southeast house line of Wildey	18	6	9	5			1	
Susquehanna avenue,	southwest side, south house line of Gaul	18	6	14	6			1	
Sterner street,	south side, east house line of Front	33	6	8	8			1	
Third street,	east side, south house line of Tioga	33	6	14	8			1	
Third street,	east side, 93 feet 6 inches north of north house line of Collingswood	33	6	12				1	
Tioga street,	north side, east house line of Frankford avenue	25	6	19	5			1	
Tulip street,	east side, south house line of Townsend	31	6	15	10			1	
Unity street,	north side, west house line of Franklin	23	6	14	5			1	
Venango street,	north side, west house line of Frankford avenue	25	6	18	11			1	

NEW FIRE HYDRANTS—THIRD DISTRICT—*Continued.*

Street. Location.	Ward.	Size of main in inches.	6-INCH CONNECTION.		STYLE.			
			Feet.	In.	O. S.	No. 1.	No. 2.	No. 3.
Waterloo street, east side, 55 feet south of south house line of Montgomery avenue	19	4	10	10	.....	1		
Waterloo street, west side, north house line of Montgomery avenue	19	6	8	6	.....	.....	1	
Waterloo street, east side, southwest house line of Gurney	33	6	10	3	.....	.....	1	
Weikle street, southeast side, northeast house line of Ann	25	6	8	2	1			
Wensley street, south side, 487 feet east of southeast house line of Kensington avenue	25	6	14	9	.....	1		
Wensley street, north side, southeast house line of Kensington avenue	25	6	14	3	.....	.....	1	
Westmoreland street, south side, east house line of Frankford avenue	25	6	19	5	.....	.....	1	
Westmoreland street, north side, west house line of Fifth	33	6	15	3	.....	.....	1	
Wilt street, south side, west house line of Howard	19	6	6		.....	.....	1	
William street, north side, southeast house line of Frankford avenue	25	6	11	5	.....	.....	1	
Wishart street, northeast side, northwest house line of Jasper	25	6	11	2	.....	.....	1	
Wishart street, northeast side, 97 feet southeast of southeast house line of Kensington avenue	25	6	11	3	.....	.....	1	
York road, west side, north house line of Willow street	11	6	26	2	.....	.....	1	
York street, north side, west house line of Coral	31	6	14	9	.....	.....	1	
York avenue, west side, 2 feet south of north house line of Callowhill street	11	6	18	10	.....	.....	1	
Total			1,921	7	1	23	118	

New Fire Hydrants—Continued.

FOURTH DISTRICT.

Street. Location.	Ward.	Size of main in inches.	6-INCH CONNECTION.		STYLE.			
			Feet.	In.	O. S.	No. 1.	No. 2.	No. 3.
Allegheny avenue, south side, 2 feet east of east house line of Fifteenth	28	6	11	5	.....	.....	1	
Allegheny avenue, north side, east house line of Fifteenth	28	6	8	1	.....	.....	1	
Allegheny avenue, south side, 5 feet east of east house line of Sixteenth	28	6	8	3	.....	.....	1	
Allegheny avenue, north side, 4 feet 5 inches east of east house line of Sixteenth	28	6	10	.....	.....	.....	1	
Allegheny avenue, south side, east house line of Seventeenth	28	6	8	6	.....	.....	1	
Allegheny avenue, south side, 15 feet east of west house line of Eighteenth	28	6	2	8	.....	.....	1	
Allegheny avenue, north side, 15 feet east of west house line of Eighteenth	28	6	8	9	.....	.....	1	
Amboy street, east side, south house line of Oxford	20	4	10	4	.....	1		
Bancroft street, west side, south house line of York	29	6	10	10	.....	1		
Bartram street, east side, south house line of Hubbs	29	6	8	3	.....	1		
Berks street, north side, 2 feet west of east house line of Twenty-eighth	32	6	15	.....	.....	.....	1	
Broad street, west side, 14 feet 6 inches south of south house line of Hamilton	15	12	36	5	.....	.....	1	
Broad street, west side, south house line of Buttonwood	15	12	35	10	.....	.....	1	
Broad street, west side, south house line of Spring Garden	15	12	36	4	.....	.....	1	
Broad street, east side, north house line of Cambria	28	12	12	7	.....	.....	1	

New Fire Hydrants—Fourth District—*Continued.*

Street. Location.	Ward.	Size of main in inches.	6-Inch Connection.		Style.			
			Feet.	In.	O. S.	No. 1.	No. 2.	No. 3.
Broad street, west side, 3 feet 4 inches north of north house line of Indiana avenue	28	12	17	9	.....	.....	1	
Broad street, east side, 112 feet north of north house line of Indiana avenue	28	6	13	9	.....	.....	1	
Broad street, west side, 48 feet north of north house line of Indiana avenue	28	12	18	3	.....	.....	1	
Broad street, east side, 126 feet 9 inches north of north house line of Indiana avenue	28	6	12	6	.....	.....	1	
Broad street, east side, 2 feet 3 inches north of north house line of Clearfield	28	6	14	5	.....	.....	1	
Broad street, west side, 2 feet 7 inches north of north house line of Clearfield	28	12	17	10	.....	.....	1	
Broad street, west side, northwest house line of Glenwood avenue	28	6	15	2	.....	.....	1	
Brown street, south side, east house line of Tenth	13	6	15	10	.....	.....	1	
Brown street, south side, east house line of Thirteenth	14	6	14	6	.....	.....	1	
Callowhill street, north side, east house line of Broad	14	10	21	4	.....	.....	1	
Callowhill street, north side, 3 feet 4 inches west of west house line of Twenty-fourth	15	10	14	2	.....	.....	1	
Callowhill street, south side, 2 feet west of east house line of Twenty-fifth	15	10	15	6	.....	.....	1	
Cambria street, north side, 3 feet 6 inches east of east house line of Eleventh	28	6	14	6	.....	.....	1	
Cambria street, north side, west house line of Thirteenth	28	6	14	4	.....	.....	1	
Cambridge street, south side, 71 feet 9 inches east of northeast house line of Ridge avenue	29	6	11	8	.....	1		
Carlisle street, west side, south house line of Parrish	15	4	12	6	.....	1		

New Fire Hydrants—Fourth District—*Continued.*

Street. Location.	Ward.	Size of main in inches.	6-Inch Connection.		Style.			
			Feet.	In.	O. S.	No. 1.	No. 2.	No. 3.
Chatham street, east side, 10 feet 6 inches south of north house line of Wilcox	15	6	16			1		
Clarion street, northwest corner of Hagert	28	6	10			1		
Clifford street, north side, east house line of Thirty-second	29	6	14	8			1	
Clifford street, north side, east house line of Natrona	29	6	14	6		1		
Cleveland avenue, east side, 10 feet 6 inches south of south house line of York street	28	6	7	6			1	
Columbia avenue, north side, 6 feet east of east house line of Broad street	20	6	19				1	
Columbia avenue, north side, west house line of Twenty-first street	29	6	18	11			1	
Columbia avenue, north side, west house line of Thirty-first street	29	6	18	4			1	
Columbia avenue, north side, west house line of Thirty-second	29	6	18	6			1	
Corlies street, east side, 9 feet 6 inches north of northeast house line of Ridge avenue	32	6	5	6		1		
Darien street, west side, south house line of Poplar	13	4	4	4		1		
Dauphin street, south side, east house line of Broad	28	10	14	7			1	
Dauphin street, north side, east house line of Nineteenth	28	6	12	6			1	
Dauphin street, south side, east house line of Twentieth	28	6	14	1			1	
Dauphin street, north side, east house line of Twenty-first	28	6	15	9			1	
Dauphin street, north side, west house line of Twenty-first	28	6	14	9			1	

New Fire Hydrants—Fourth District—*Continued.*

Street.	Location.	Ward.	Size of main in inches.	6-Inch Connection.		Style.			
				Feet.	In.	O. S.	No. 1.	No. 2.	No 3.
Diamond street, south side, east house line of Eleventh		20	6	13	6	.....	.....	1	
Diamond street, north house line, east curb line of Marston		32	6	11	10	.....	.....	1	
Diamond street, north house line, west curb line of Twenty-eighth		32	6	18	6	.....	.....	1	
Diamond street, south side, east house line of Twenty-ninth		32	6	6	3	.....	.....	1	
Dover street, west side, south house line of Jefferson		29	6	9	.....	.....	.....	1	
Eighth street, west side, 20 feet north of north house line of Wood		13	10	12	10	.....	.....	1	
Eighth street, east side, 8 feet south of south house line of Buttonwood		13	10	11	8	.....	1		
Eighteenth street, east side, 10 feet south of south house line of Montgomery avenue		29	6	13	9	.....	.....	1	
Eleventh street, west side, north house line of Girard avenue		20	6	15	.....	.....	.....	1	
Eleventh street, east side, south house line of Oxford		20	6	14	10	.....	.....	1	
Emlen street, north side, 2 feet east of east house line of Broad		28	6	9	.....	.....	1		
Fairmount avenue, south side, east house line of Nineteenth street		15	10	25	5	.....	.....	1	
Fairmount avenue, north side, west house line of Twenty-second street		15	10	24	.....	.....	.....	1	
Fairmount avenue, south side, west house line of Twenty-third street		15	10	26	.....	.....	.....	1	
Fifteenth street, east side, south house line of Columbia avenue		29	6	19	.....	.....	.....	1	
Fifteenth street, west side, north house line of Columbia avenue		29	6	14	10	.....	.....	1	

NEW FIRE HYDRANTS—FOURTH DISTRICT—*Continued.*

Street.	Location.	Ward.	Size of main in inches.	6-INCH CONNECTION.		STYLE.			
				Feet.	In.	O. S.	No. 1.	No. 2.	No. 3.
Fletcher street, north side, 162 east of east house line of Twenty-seventh		28	6	14	3	.....	.....	1	
Fletcher street, north side, 77 feet east of east house line of Twenty-eighth		28	6	14	4	.....	.....	1	
Fletcher street, south side, 144 feet 3 inches, east of east house line of Twenty-ninth.		28	6	14	6	.....	.....	1	
Fletcher street, north side, 63 feet west of west house line of Twenty-ninth		28	6	14	6	.....	.....	1	
Folsom street, north side, west house line of Twenty-sixth		15	6	8	4	.....	1		
Fountain street, north side, 5 feet west of west house line of Seventeenth		32	6	12	.....	.....	.....	1	
Twenty-sixth and Master streets, Fourth District yard, Bureau of Water		29	6	20	6	.....	1		
Girard avenue, south side, west house line of Seventeenth		29	6	11	7	.....	.....	1	
Girard avenue, south side, 14 feet 9 inches east of east house line of Ridge avenue		29	6	11	7	.....	.....	1	
Girard avenue, north side, east house line of Nineteenth		29	6	18	5	.....	.....	1	
Gratz street, east side, north house line of Diamond		32	6	10	9	.....	.....	1	
Gratz street, east side, 6 feet 4 inches south of south house line of York		28	6	6	.....	.....	1		
Hamilton street, north side, east house line of Broad		14	6	9	.....	.....	.....	1	
Hollywood street, east side, 43 feet north of north house line of Thompson		29	6	8	6	.....	1		
Howard street, east side, south house line of Brown		15	4	10	.....	.....	1		
Hutchinson street, west side south house line of Oxford		20	6	12	.....	.....	.....	1	

New Fire Hydrants—Fourth District—*Continued.*

Street. Location.	Ward.	Size of main in inches.	6-Inch Connection.		Style.			
			Feet.	In.	O. S.	No. 1.	No. 2.	No. 3.
Hutchinson s reet, east side, 226 feet north of north house line of Oxford	20	6	8	5	.....	1		
Jefferson street, south side, east house line of Eighth	20	6	14	.....	.....	.....	1	
Jefferson street, south side, east house line of Twenty-fifth	29	6	14	8	.....	.....	1	
Kessler street, east side, south house line of Brown	13	6	14	6	.....	.....	1	
Knox street, west side, 136 feet north of north house line of Brown	13	6	8	6	.....	1	1	
Lehigh avenue, south side, east house line of Eleventh	28	6	9	7	.....	.....	1	
Marshall street, west side, 535 feet north of north house line of Poplar	20	6	14	3	.....	.....		
Marshall street, east side, 3 feet south of south house line of Wager	20	6	14	9	.....	1		
Marston street, southwest side, northwest house line of Ellwood	32	6	6	9	.....	1		
Master street, south side, east house line of Twenty-first	29	6	13	9	.....	.....	1	
Master street, north side, west house line of Twenty-first	29	6	14	6	.....	.....	1	
Master street, south side, 2 feet west of west house line of Twenty-second	29	6	14	6	.....	.....	1	
Meredith street, north side, 66 feet west of west house line of Twenty-fourth	15	4	8	.....	.....	1		
Mervine street, west side, south house line of Jefferson	20	6	13	10	.....	.....	1	
Mervine street, west side, south house line of Oxford	20	6	14	6	.....	.....	1	
Mervine street, west side, 5 feet 8 inches south of south house line of Columbia avenue	20	6	13	11	.....	.....	1	

NEW FIRE HYDRANTS—FOURTH DISTRICT—*Continued.*

Street.	Location.	Ward.	Size of main in inches.	6-INCH CONNECTION.		STYLE.			
				Feet.	In.	O. S.	No. 1.	No. 2.	No. 3.
Mervine street, west side, 136 feet 9 inches north of north house line of Norris		32	6	14	4	.....	.....	1	
Montgomery avenue, south side, east house line of Mervine		20	6	15	6	.....	.....	1	
Montgomery avenue, south side, 3 feet east of east house line of Twelfth		20	6	15	.....	.....	.....	1	
Montgomery avenue, south side, west house line of Twenty-seventh		29	6	14	.....	.....	.....	1	
Mt. Pleasant street, north side, west house line of Taney		29	6	14	6	.....	.....	1	
Mt. Vernon street, south side, 5 feet east of east house line of Eleventh		14	6	15	.....	.....	.....	1	
Myrtlewood street, west side, north house line of Thompson		29	6	9	.....	.....	1		
Nevada street, north side, 108 feet west of west house line of Twenty-ninth		28	6	8	6	.....	1		
Newkirk street, west side, north house line of Diamond		32	6	13	11	.....	1		
Nineteenth street, west side, 158 feet 6 inches north of north house line of Susquehanna avenue		28	6	14	10	.....	.....	1	
Ninth street, east side, north house line of Columbia avenue		20	6	13	9	.....	.....	1	
Noble street, south side, 48 feet west of west house line of Franklin		13	6	12	6	.....	1		
North College avenue, north side, 121 feet 5 inches east of east house line of Twenty-first		29	6	7	8	.....	.....	1	
Norris street, south side, west house line of Sixteenth		32	6	14	9	.....	.....	1	
Norwood street, east side, 156 feet 2 inches north of north house line of Columbia avenue		29	6	8	.....	.....	1		
Oxford street, north side, east house line of Eighth		20	6	13	9	.....	.....	1	

NEW FIRE HYDRANTS—FOURTH DISTRICT—*Continued.*

Street. Location.	Ward.	Size of main in inches.	6-INCH CONNECTION.		STYLE.			
			Feet.	In.	O. S.	No. 1.	No. 2.	No. 3.
Oxford street, south side, west house line of Twenty-eighth	29	6	14	6	.....	.....	1	
Page street, south side, 7 feet west of west house line of Seventeenth	32	6	12	.....	.....	.....	1	
Park Terrace, north side, west house line of Twenty-sixth	15	6	8	.....	.....	1		
Parrish street, south side, east house line of Marshall	13	6	13	.....	.....	.....	1	
Parrish street, south side, east house line of Knox	13	6	12	.....	.....	.....	1	
Parrish street, north side, east house line of Sixteenth	15	6	14	.....	.....	.....	1	
Perot street, south side, 64 feet west of west house line of Twenty-fourth	15	6	8	.....	.....	1		
Perth street, west side, 3 feet south of south house line of Poplar	20	4	8	6	.....	1		
Perth street, west side, 3 feet south of south house line of Master	20	4	9	.....	.....	1		
Poplar street, north side, west house line of Monroe	29	6	17	4	.....	.....	1	
Ridge avenue, southwest side, 13 feet northeast of north house line of Alroy	14	6	17	3	.....	1		
Ridge avenue, northeast side, 19 feet 10 inches southeast of south house line of Poplar	29	6	17	10	.....	.....	1	
Ridge avenue, southwest side, 40 feet southeast of southeast house line of Wylie	15	6	16	5	.....	.....	1	
Ridge avenue southwest side, 2 feet southeast of southeast house line of Francis	15	6	14	7	.....	.....	1	
Ridge avenue, southwest side, 124 feet southeast of southeast house line of Ginodo	29	6	19	7	.....	1		
Ridge avenue, southwest side, south house line of Master	29	6	15	.....	.....	.....	1	

New Fire Hydrants—Fourth District—*Continued.*

Street.	Location.	Ward.	Size of main in inches.	6-Inch Connection.		Style.			
				Feet.	In.	O. S.	No. 1.	No. 2.	No. 3.
Ridge avenue,	southwest side, 195 feet 9 inches northwest of north house line of Diamond	32	12	9				1	
Sartain street,	west side, south house line of Girard avenue	20	6	8	6			1	
Seventeenth street,	west side, south house line of Markham	15	6	15	4			1	
Seventeenth street,	west side, south house line of Poplar	15	6	14	3			1	
Seventeenth street,	west side, 2 feet 10 inches south of south house line of Diamond	32	6	14	3			1	
Seventeenth street,	east side, 5 feet 8 inches south of south house line of York	28	6	13				1	
Seventeenth street,	east side, south house line of Cumberland	28	6	15				1	
Seventeenth street,	west side, north house line of Clearfield	28	6	26	1			1	
Seybert street,	north side, west house line of Twenty-third	29	6	11	6		1		
Sixteenth street,	west side, south house line of Buttonwood	15	6	16	9			1	
Sixteenth street,	west side, south house line of Mt. Vernon	15	6	17	10			1	
Sixteenth street,	east side, opposite south house line of Valeria	15	6	14	9			1	
Sixteenth street,	west side, south house line of Poplar	15	20	12				1	
Sixteenth street,	east side, north house line of Tucker	28	6	14	9		1		
Somerville street,	north side, 7 feet 6 inches east of east house line of Twelfth	28	6	11	10			1	
Spring Garden street,	north side, east house line of Marshall	13	6	11	2			1	

New Fire Hydrants—Fourth District—*Continued.*

Street. Location.	Ward.	Size of main in inches.	6-Inch Connection.		Style.			
			Feet.	In.	O. S.	No. 1.	No. 2.	No. 3.
Spring Garden street, north side, east house line of Franklin	13	6	12	2			1	
Spring Garden street, south side, west house line of Lorain	13	10	11	6			1	
Spring Garden street, south side, west line of Eighth	13	6	13				1	
Spring Garden street, north side, 5 feet east of east house line of Ninth	13	6	11	9			1	
Spring Garden street, south side, 181 feet 6 inches west of west house line of Ninth	13	10	11	5			1	
Spring Garden street, south side, 93 feet 5 inches east of east house line of Eleventh	14	10	10	10			1	
Spring Garden street, south side, 140 feet 10 inches west of west house line of Eleventh	14	10	12	3			1	
Spring Garden street, north side, 106 feet 6 inches east of east house line of Thirteenth	14	6	11	5			1	
Spring Garden street, south side, 97 feet 9 inches east of east house line of Thirteenth	14	10	13				1	
Spring Garden street, south side, east house line of Broad	14	10	15	7			1	
Spring Garden street, north side, east house line of Broad	14	6	14	4			1	
Spring Garden street, south side, east house line of Fifteenth	15	10	26	10			1	
Spring Garden street, north side, east house line of Fifteenth	15	10	26	10			1	
Spring Garden street, south side, east house line of Sixteenth	15	10	29	10			1	
Spring Garden street, north side, east house line of Sixteenth	15	10	25	11			1	
Spring Garden street, south side, east house line of Seventeenth	15	10	29				1	

New Fire Hydrants—Fourth District—*Continued.*

Street.	Location.	Ward.	Size of main in inches.	6-Inch Connection.		Style.			
				Feet.	In.	O. S.	No. 1.	No. 2.	No. 3.
Spring Garden street.	north side, east house line of Seventeenth	15	10	24				1	
Spring Garden street,	north side, 4 feet east of east house line of Eighteenth	15	10	24	3			1	
Spring Garden street,	south side, east house line of Eighteenth	15	10	26	9			1	
Spring Garden street,	north side, 5 feet 5 inches west of west house line of Eighteenth	15	10	26	2			1	
Spring Garden street,	south side, 8 feet 6 inches west of west house line of Twentieth	15	10	27	1			1	
Spring Garden street,	north side, 9 feet west of west house line of Twentieth	15	10	26	8			1	
Spring Garden street,	north side, 137 feet 5 inches west of west house line of Twenty-first	15	10	29	11			1	
Spring Garden street,	north side, west house line of Twenty-second	15	10	25				1	
Spring Garden street,	south side, 2 feet 6 inches east of east house line of Twenty-fifth	15	6	14	6			1	
Stanley street,	east side, 18 feet 6 inches north of northeast house line of Ridge avenue	20	6	5	6		1		
Stiles street,	north side, east house line of Sixteenth	29	4	11	2			1	
Susquehanna avenue,	south side, east house line of Thirty-first	32	6	16	4			1	
Swain street,	north side, 3 feet east of east house line of Sixteenth	15	6	11				1	
Swain street,	north side, east house line of Seventeenth	15	6	11	7			1	
Sydenham street,	east side, 12 feet south of south house line of Clearfield	28	6	9				1	
Tenth street,	east side, south house line of Fairmount avenue	13	6	14	5			1	

NEW FIRE HYDRANTS—FOURTH DISTRICT—*Continued.*

Street. Location.	Ward.	Size of main in inches.	6-INCH CONNECTION.		STYLE.			
			Feet.	In.	O. S.	No. 1.	No. 2.	No. 3.
Tenth street, east side, south house line of Master	20	6	14	6	.....	.....	1	
Thirteenth street, west side, 83 feet 8 inches south of south house line of Willow	14	6	14	9	.....	.....	1	
Thirteenth street, east side, south house line of Jefferson	20	6	14	6	.....	.....	1	
Thirteenth street, east side, south house line of Fremont	28	6	16	.....	.....	.....	1	
Thirty-second street, west side, 20 feet south of south house line of Master	29	10	13	6	.....	.....	1	
Thirty-second street, east side, south house line of Jefferson	29	6	17	6	.....	.....	1	
Thompson street, south side, 38 feet 2 inches east of northeast house line of Ridge avenue	29	6	14	3	.....	.....	1	
Twelfth street, east side, south house line of Jefferson	20	6	13	10	.....	.....	1	
Twelfth street, east side, south house line of Oxford	20	6	14	4	.....	.....	1	
Twelfth street, west side, north house line of Columbia avenue	20	6	15	.....	.....	.....	1	
Twelfth street, east side, 181 feet north of north house line of Columbia avenue	20	6	14	.....	.....	1		
Twelfth street, west side, 15 feet 6 inches south of south house line of York	28	6	14	.....	.....	.....	1	
Twentieth street, west side, 1 foot north of north house line of Dauphin	28	6	10	.....	.....	.....	1	
Twenty-eighth street, east side, south house line of Mt. Pleasant	29	6	13	10	.....	.....	1	
Twenty-fifth street, west side, north house line of Jefferson	29	12	9	2	.....	.....	1	
Twenty-fifth street, west side, 6 feet south of south house line of Turner	29	12	14	5	.....	.....	1	

New Fire Hydrants—Fourth District—*Continued.*

Street. Location.	Ward.	Size of main in inches.	6-Inch Connection.		Style.			
			Feet.	In.	O. S.	No. 1.	No. 2.	No. 3.
Twenty-fifth street, east side, south house line of Columbia avenue	29	10	14	6	.....	.....	1	
Twenty-first street, west side, opposite northeast house line of Ridge avenue	29	6	14	.....	.....	.....	1	
Twenty-first street, west side, north house line of Susquehanna avenue	28	6	14	11	.....	.....	1	
Twenty-first street, west side, south house line of York	28	48	21	9	.....	.....	1	
Twenty-ninth street, West side, northeast house line of Ridge avenue	32	6	22	10	.....	.....	1	
Twenty-second street, west side, south house line of Berks	32	6	18	.....	.....	.....	1	
Twenty-second street, west side, south house line of York	28	48	20	.....	.....	.....	1	
Twenty-second street, east side, 1 foot 6 inches south of south house line of Huntingdon	28	6	18	.....	.....	.....	1	
Twenty-seventh street, west side, south house line of Harper	29	6	14	4	.....	.....	1	
Twenty-seventh street, west side, south house line of Jefferson	29	6	18	3	.....	.....	1	
Twenty-seventh street, west side, south house line of Berks	32	6	14	.....	.....	.....	1	
Twenty-seven-and-a-half street, east side, southeast house line of Glenwood	32	6	9	.....	.....	1		
Twenty-sixth street, west side, south house line of Hare	15	6	13	8	.....	.....	1	
Twenty-third street, west side, 4 feet 3 inches north of northeast house line of Ridge avenue	29	6	14	.....	.....	.....	1	
Virginia street, north side, 5 feet 6 inches west of west house line of Twenty-fourth	15	6	9	.....	.....	1		
Wallace street, south side, 83 feet 8 inches east of east house line of Eleventh	14	6	14	6	.....	.....	1	

NEW FIRE HYDRANTS—FOURTH DISTRICT—*Continued.*

Street. Location.	Ward.	Size of main in inches.	6-INCH CONNECTION.		STYLE.			
			Feet.	In.	O. S.	No. 1.	No. 2.	No. 3.
Warnock street, east side, south house line of Oxford	20	6	8	3	.....	.....	1	
Whitehall street, south side, east house line of Broad	14	6	5	10	.....	.....	1	
Willington street, west side, south house line of Cumberland	28	6	11	.....	.....	1		
Wood street, north side, 182 feet east of east house line of Eighteenth	15	4	12	.....	.....	1		
Woodstock street, west side, north house line of Montgomery avenue	32	6	14	2	.....	.....	1	
York street, south side, 6 feet west of west house line of Eighteenth	28	48	9	9	.....	.....	1	
York street, north side, west house line of Twentieth	28	48	24	.....	.....	.....	1	
York street, north side, east house line of Twenty-first	28	6	13	6	.....	.....	1	
York street, north side, 140 feet 6 inches east of east house line of Twenty-second	28	6	14	.....	.....	.....	1	
York street, south side, 17 feet west of west house line of Twenty ninth	28	6	14	4	.....	.....	1	
Total	.....	.....	3,154	5	.....	41	176	

New Fire Hydrants—Continued.

FIFTH DISTRICT.

Street. Location.	Ward.	Size of main in inches.	6-INCH CONNECTION.		STYLE.			
			Feet.	In.	O. S.	No. 1.	No. 2	No. 3.
Ashland street, southwest side, 256 feet southeast of southeast house line of Penn	21	6	14	6	.....	.....	1	
Freeland avenue, northeast side, 6 feet southeast of southeast house line of Levering	21	6	14	6	.....	.....	1	
Hermit street, northwest side, 5 feet southwest of southwest house line of Ridge avenue	21	6	10	.....	.....	.....	1	
Jeanette street, southwest side, 5 feet southwest of southwest house line of Retta	21	6	19	6	.....	.....	1	
Jefferson street, northwest side, 230 feet northeast of northeast house line of Selig	21	6	14	.....	.....	.....	1	
Manayunk avenue, southwest side, 304 feet southeast of southeast house line of Cedar street	21	6	14	6	.....	.....	1	
Osborne street, on dead end of 6-inch pipe, 224 feet southwest of southwest house line of Ridge avenue	21	6	.....	.....	.....	.....	1	
Port Royal avenue, southeast side, 578 feet southwest of southwest house line of Ridge avenue	21	6	6	6	.....	.....	1	
Port Royal avenue, southeast side, 1393 feet southwest of southwest house line of Ridge avenue	21	6	10	6	.....	.....	1	
Ridge avenue, southwest side, 739 feet northwest of southeast house line of Upper Rodman	28	12	6	6	.....	.....	1	
Roxborough avenue, northwest side, 25 feet southwest of southwest house line of Pechin	21	12	19	.....	.....	.....	1	
Twenty-third street, northeast side, 2 feet southeast of southeast house line of Venango	28	6	14	.....	.....	.....	1	
Total	.....	.....	1,486	.....	.....	.....	12	

New Fire Hydrants—Continued.

SIXTH DISTRICT.

Street.	Location.	Ward.	Size of main in inches.	6-INCH CONNECTION.		STYLE.			
				Feet.	In.	O. S.	No. 1.	No. 2.	No. 3.
Bellfield street,	northeast side southeast house line of Mill	22	6	19	2	.....	.....	1	
Broad street,	west side, north house line of Allegheny avenue	28	12	18	2	.....	.....	1	
Broad street,	west side, south house line of Westmoreland	28	12	18	4	.....	.....	1	
Broad street,	east side, 250 feet south of south house line of Tioga	28	6	16	4	.....	1		
Broad street,	west side, south of house line of Tioga	28	6	18	6	.....	.....	1	
Broad street,	east side, 243 feet 4 inches north of north house line of Tioga	28	6	16	4	.....	1		
Broad street,	west side, south house line of Venango	28	12	19	8	.....	.....	1	
Broad street,	east side, 250 feet north of north house line of Venango	28	6	16	4	.....	1		
Broad street,	west side, south house line of Erie avenue	28	12	19	8	.....	.....	1	
Chew street,	northeast side, southeast house line of Mill	22	6	21	10	.....	.....	1	
Chew street,	northeast side, southeast house line of Chelten avenue	22	6	25	3	.....	.....	1	
Dounton street,	southeast side, northeast house line of Germantown avenue	33	6	10	6	.....	.....	1	
Dounton street,	northwest side, 203 feet northeast of northeast house line of Germantown avenue	33	6	11	.....	.....	1		
Dounton street,	southeast side, 562 feet northeast of northeast house line of Germantown avenue	33	6	11	6	.....	1		
Durham street,	southeast side, northeast house line of Chew	22	6	16	3	.....	.....	1	

New Fire Hydrants—Sixth District—*Continued.*

Street.	Location.	Ward.	Size of main in inches.	6-Inch Connection.		Style.			
				Feet.	In.	O. S.	No. 1.	No. 2.	No. 3.
Earlham street,	northwest side, 229 feet 8 inches southwest of southwest house line of Pulaski avenue	22	6	14	2	.....	1		
Emlen street,	northeast side, 2 feet 6 inches northwest of northwest house line of Franklin	22	6	17	.....	.....	.....	1	
Fifteenth street,	west side, south house line of Westmoreland	28	6	14	6	.....	.....	.....	1
Fifteenth street,	west side, north house line of Erie avenue	28	6	14	6	.....	.....	1	
Fifteenth street,	east side, 2 feet 6 inches north of north house line of Butler	28	6	14	.....	.....	.....	1	
Germantown avenue,	northeast side northeast house line of Green street	33	6	18	5	.....	.....	1	
Germantown avenue,	southwest side, southeast house line of Harvey	22	6	9	.....	.....	.....	1	
Germantown avenue,	southwest side, 2 feet 2 inches, southwest of southwest house line of Tulpehocken	22	16	4	.....	.....	.....	1	
Green street,	northeast side, northwest house line of Norton	22	6	20	.....	.....	1		
Green street,	northeast side, northwest house line of Upsal	22	6	19	8	.....	.....	1	
Green street,	on dead end of 6 inch pipe, 456 feet northwest of northwest house line of Robert's avenue	22	6	.....	.....	.....	1		
Harvey street,	northwest side, 529 feet 4 inches northeast of northeast house line of Wayne avenue	22	10	18	10	.....	.....	1	
Herman street,	southeast side, 2 feet 2 inches northeast of southwest house line of Morton	22	6	10	4	.....	.....	1	
Herman street,	northwest side, northeast house line of Osceola	22	6	15	6	.....	.....	1	
Herman street,	northwest side, northeast house line of Hancock	22	6	12	7	.....	.....	1	
Herman street,	northwest side, 302 feet 5 inches northeast of northeast house line of Germantown ave	22	6	12	9	.....	1		

NEW FIRE HYDRANTS—SIXTH DISTRICT—*Continued.*

Street.	Location.	Ward.	Size of main in inches.	6-INCH CONNECTION.		STYLE.			
				Feet.	In.	O. S.	No. 1.	No. 2.	No. 3.
High street,	southeast side, 807 feet northeast of northeast house line of Cedar lane	22	6	10				1	
Howard street,	southeast side, 228 feet 10 inches southwest of southwest house line of Sixteenth	33	6	9	8		1		
Howard street,	northwest side, 2 feet 2 inches southwest of southwest house line of Sixteenth	33	6	9	8			1	
Kenderton street,	east side, south house line of Venango	33	6	11				1	
Lafayette street,	northwest side, 304 feet 10 inches northeast of northeast house line of Adams	22	6	9	2			1	
Locust street,	southeast side, northeast house line of Cedar lane	22	6	10				1	
Locust street,	southeast side, southwest house line of Buckius	22	6	16	7				1
Meehan avenue,	southeast side, southwest house line of Chew	22	6	21	6			1	
Meehan avenue,	southeast side, northeast house line of Musgrove	22	6	10				1	
Morris street,	southeast side, northwest house line of Manheim	22	6	16	6			1	
Morris street,	southeast side, 255 feet 6 inches southeast of southeast house line of Hansberry	22	6	16	6		1		
Mt. Pleasant avenue,	northwest side, northeast house line of Chew	22	6	15	6			1	
Nicetown lane,	south side, 2 feet 8 inches, east of east house line of Wissahickon	28	12	14	3			1	
Nicetown lane,	north side, east house line of Schuyler	28	12	9				1	
Nineteenth street,	east side, north house line of Atlantic	28	6	13	2				
Nineteenth street,	east side, north house line of Atlantic	28	6	4	5			1	

New Fire Hydrants—Sixth District—*Continued.*

Street. Location.	Ward.	Size of main in inches.	6-Inch Connection.		State.			
			Feet.	In.	O. S.	No. 1.	No. 2.	No. 3.
Penn street, northwest side, southwest house line of Knox	22	6	20				1	
Penn street, southeast side, northeast house line of Wayne	22	6	14	5			1	
Price street, northwest side, southwest house line of Willow avenue	22	6	18				1	
Stafford street, northwest side, 393 feet southwest of southwest house line of Morris	22	6	13			1		
Springfield street, northwest side, northeast house line of Twenty-eighth	22	6	11	8			1	
Tacona street, southwest side, 216 feet 6 inches southeast of southeast house line of Seymour	22	6	13	6		1		
Tacona street, northeast side, northwest house line of Seymour	22	6	13	6		1		
Tioga street, north side, east house line of Eleventh	28	6	13	6			1	
Tulpehocken street, northwest side, northeast house line of Musgrove	22	6	16				1	
Tulpehocken street, southeast side, northeast house line of Morton	22	6	16				1	
Tulpehocken street, northwest side, 383 feet northeast of northeast house line of Morton	22	6	16			1		
Twentieth street, west side, north house line of Allegheny avenue	28	6	14	6			1	
Twentieth street, east side, opposite north house line of Delaware avenue	28	6	14	6		1		
Upsal street, southeast side, 375 feet northeast of northeast house line of Green	22	10	20			1		
Walnut street, northwest side, 19 feet southwest of southwest house line of Chew	22	6	14	6		1		
Walnut street, northwest side, 258 feet 8 inches northeast of northeast house line of Musgrove	22	6	14	4		1		

New Fire Hydrants—Sixth District—*Continued.*

Street.	Location.	Ward.	Size of main in inches.	6-Inch Connection.		State.			
				Feet.	In.	O. S.	No. 1.	No. 2.	No. 3.
Wayne street,	northeast side, 351 feet northwest of northwest house line of Apsley	22	6	21			1		
Westmoreland street,	north side, east house line of Eighteenth	28	6	15	6			1	
Willow Grove avenue,	northwest side, northeast house line of Seminole	22	6	19				1	
Willow Grove avenue,	northwest side, southwest house line of Twenty-ninth street	22	6	19				1	
Willow Grove avenue,	northwest side, southwest house line of Twenty-eighth	22	6	22				1	
Willow Grove avenue,	southeast side, northeast house line of Twenty-seventh street	22	6	23				1	
Wissahickon avenue,	northeast side, 432 feet 9 inches northwest of northwest house line of Nicetown lane	28	6	9	2	1			
Wissahickon avenue,	northeast side, 1320 feet 2 inches northwest of northwest house line of Nicetown lane	28	6	9	5	1			
Woodbine street,	northwest side, southwest house line of Sprague	22	6	15	6			1	
Wyndmoor street,	southeast side, 407 feet northeast of northeast house line of Stenton ave., Montgomery Co.		6	16				1	
Wyndmoor street,	northwest side, 398 ft. southwest of southwest house line of Ardmore, Montgomery Co.		6	16			1		
Wyndmoor street,	southeast side, southwest house line, of Ardmore, Montgomery County		6	16				1	
Total				1,111		2	21	49	2

FIRE HYDRANTS RENEWED.

First District.

Street.	Location.	Ward.	Size of Main.		6-inch Connection.		Style.							
							Taken out.				Put in.			
			Old.	New.	Feet.	In.	O. S.	No. 1.	No. 2.	No. 3.	O. S.	No. 1.	No. 2.	No. 3.
Bainbridge street, north side, 189 feet east of east house line of Ninth		4	6		15	6	1					1		
Bainbridge street, south side, 185 feet west of west house line of Broad		30	6		15		1						1	
Canal street, north side, east house line of Fourth		1	4		8	6	1						1	
Carpenter street, south side, 121 feet east of east house line of ninth		2	6		15		1						1	
Carpenter street, north side, 169 feet west of west house line of Ninth		2	6		15		1						1	
Catharine street, north side, 210 feet west of west house line of Eighteenth		30	6		14	6	1						1	
Christian street, south side, 4 feet east of east house line of Fourth		2	10		17		1						1	
Esprey street, west side, 135 feet north of north house line of Catharine		3	4		5		1					1		
Everett street, north side, 69 feet east of east house line of Thirteenth		2	4		8		1					1		
Federal street, north side, 8 feet east of east house line of Twenty-fourth		26	20		4	6	1						1	
Federal street, north side, east house line of Twenty-fifth		26	6		17		1						1	
Fifth street, east side, 125 feet north of north house line of Morris		1	6		15	6	1						1	
Gray's Ferry road, northwest side, 125 feet northeast of north house line of Bainbridge		30	6		18	6	1						1	
Hicks street, east side, 93 feet south of south house line of Mifflin		26	6							1		1		

Fire Hydrants Renewed—First District—*Continued.*

Street	Location.	Ward.	Size of Main.		6-Inch Connection.		Style.							
							Taken out.				Put in.			
			Old.	New.	Feet.	In.	O. S.	No. 1.	No. 2.	No. 3.	O. S.	No. 1.	No. 2.	No. 3.
Lebanon street, east side, 69 feet south of south house line of Fitzwater		3	4		11	6	1					1		
Lingo street, east side, 123 feet north of north house line of Reed		26	4		5		1					1		
McClellan street, north side, 114 feet west of west house line of Eighth		1	4		9	6	1					1		
Moore street, north side, 14 feet east of east house line of Moyamensing avenue		1	6		7		1						1	
Moyamensing avenue, 13 feet southwest of north house line of Marion in market house		2	6		16		1					1		
Moyamensing avenue, 10 feet southwest of south house line of Pine in market house		2	6		7		1					1		
Passyunk avenue, west side, 159 feet south of south house line of Reed		26	6		15	6	1						1	
Queen street, north side, 236 feet west of west house line of Second		3	6		14	6	1						1	
Queen street, south side, east house line of Sixth		26	6		14	6	1						1	
Second street, east side, 227 feet south of south house line of Reed		1	6		14	6	1					1		
Seventeenth street, east side, 11 feet south of south house line of Fitzwater		30	6		15	6	1						1	
South street, north side, 51 feet west of west house line of Second		5	10		8		1					1		
South street, south side, 166 feet east of east house line of Sixteenth		30	16		15		1						1	
Southerland avenue, northwest side, 112 feet northeast of north house line of Christian		30	6		21		1					1		
Sutherland avenue, northwest side, 22 feet southwest of south house line of Kansas		30	6		21		1					1		

Fire Hydrants Renewed—First District—*Continued.*

Street.	Location.	Ward.	Size of Main.		6-Inch Connection.		Style.							
							Taken out.				Put in.			
			Old.	New.	Feet	In.	O. S.	No. 1.	No. 2.	No. 3.	O. S.	No. 1.	No. 2.	No. 3.
Sutherland avenue, northeast side, 80 feet northeast of north house line of Kansas		30	6	.....	21	.....	1	.....	.....	.....	.....	1	.....	.....
Sutherland avenue, northeast side, 250 feet southwest of south house line of Bainbridge		30	6	.....	21	.....	1	.....	.....	.....	.....	1	.....	.....
Swanson street, east side, north house line of Catharine		3	6	.....	15	6	1	.....	.....	.....	.....	.....	1	.....
Tasker street, north side, 241 feet east of east house line of Second		1	6	.....	15	.....	1	.....	.....	.....	.....	1	.....	.....
Tasker street, south side, east house line of Sixth		1	6	.....	15	.....	1	.....	.....	.....	.....	.....	1	.....
Titan street, south side, 199 feet west of west house line of Eighteenth		26	4	.....	9	.....	1	.....	.....	.....	.....	1	.....	.....
Twentieth street, west side, 13 feet south of south house line of Pemberton		30	10	.....	14	6	1	.....	.....	.....	.....	.....	1	.....
Twenty-first street, east side, 3 feet north of north house line of Carpenter		30	6	.....	15	.....	1	.....	.....	.....	.....	.....	1	.....
Twenty-third street, east side, 12 feet south of south house line of Catharine		30	6	.....	14	6	1	.....	.....	.....	.....	.....	1	.....
Twelfth street, west side 3 feet north of north house line of McKean		1	6	.....	15	.....	1	.....	.....	.....	.....	.....	1	.....
Twelfth street, west side, 82 feet north of north house line of Bainbridge		4	6	.....	15	.....	1	.....	.....	.....	.....	1	.....	.....
Wharton street, north side, 30 feet southeast of southeast house line of Moyamensing ave		2	4	.....	15	.....	1	.....	.....	.....	.....	1	.....	.....
Wharton street, north side, 84 feet east of east house line of Fifth		2	6	.....	15	.....	1	.....	.....	.....	.....	1	.....	.....
Total		.....	.....	.....	565	.....	41	.....	.....	1	.....	20	22	.....

FIRE HYDRANTS RENEWED.

SECOND DISTRICT.

Street.	Location.	Ward.	Size of Main.		6-Inch Connection.		Style.								
							Taken out.					Put in.			
			Old.	New.	Feet.	In.	O. S.	No. 1.	No. 2.	No. 3.	No. 5.	O. S.	No. 1.	No. 2.	No. 3.
Arch street, south side, 14 feet west of west house line of Delaware ave		6	6		8		1						1		
Arch street, north side, west house line of Front		6	8							1				1	
Arch street, south side, 197 feet west of west house line of Third		6	8						1					1	
Arch street, north side, 170 feet west of west house line of Seventh		10	10		19		1							1	
Arch street, southwest corner of Ninth		9	30							1					1
Arch street, north side, 166 feet east of east house line of Tenth		10	10		19		1							1	
Arch street, north side, 192 feet east of east house line of Eleventh		10	10		19		1							1	
Arch street, north side, 201 feet west of west house line of Eleventh		10	10		20		1							1	
Arch street, north side, 180 feet west of west house line of Twelfth		10	10		20	8	1							1	
Arch street, south side, 81 feet east of east house line of Broad		9	10		19		1							1	
Arch street, south side, 173 feet west of west house line of Fifteenth		9	12		13		1				1			1	
Broad street, west side, 5 feet south of south house line of Race		10	20								1			1	
Broad street, east side, 253 feet south of south house line of Vine		10	20											1	
Centre street, south side, opposite centre of Blodgett		24	6				1					1			

Fire Hydrants Renewed—Second District—*Continued.*

Street.	Location.	Ward.	Size of Main. Old.	Size of Main. New.	6-Inch Connection. Feet.	6-Inch Connection. In.	Style. Taken out. O. S.	Taken out. No. 1.	Taken out. No. 2.	Taken out. No. 3.	Put in. O. S.	Put in. No. 1.	Put in. No. 2.	Put in. No. 3.
Cherry street, south side, 114 feet west of west house line of Ninth		10	6		13		1					1		
Cherry street, southeast corner of Tenth		10	6		2		1						1	
Cherry street, north side, 3 feet west of west house line of Juniper		10	6		11		1						1	
Cherry street, south side, opposite centre of Friedlander		10	6						1				1	
Chestnut street, south side, 132 feet east of east house line of Eleventh		8	10		4		1						1	
Chestnut street, north side, 203 feet west of west house line of Eleventh		9	10		8		1						1	
Chestnut street, northwest corner of Seventeenth		9	16							1				1
Chestnut street, northwest corner of Eighteenth		9	16							1				1
Chestnut street, northwest corner of Eighteenth		9	16		2					1				1
Chestnut street, south side, east house line of Fifty-sixth		27	8				1				1			
Chester avenue, north side, 11 feet east of east house line of Forty-eighth		27	6				1				1			
Compromise street, north side, opposite centre of Cook		7	6				1					1		
Dock street, northeast side, 195 feet southeast of southeast house line of Second		5	6		7		1						1	
Eighth street, east side, 113 feet north of north house line of Locust		8	10		14		1						1	
Eighth street, west side, 107 feet north of north house line of Walnut		8	10		7		1						1	

FIRE HYDRANTS RENEWED—SECOND DISTRICT—*Continued.*

Street.	Location.	Ward.	Size of Main.		6-Inch Connection.		Style.								
							Taken out.					Put in.			
			Old.	New.	Feet.	In.	O. S.	No. 1.	No. 2	No. 3.	No. 6.	O. S.	No. 1.	No. 2	No. 3.
Eighth street, east side, 134 feet south of south house line of Spruce		7	10		14		1							1	
Evelina street, north side, 10 feet west of west house line of Levant		5	6				1					1			
Eleventh street, east side, 197 feet, north of north house line of Spruce		8	10											1	
Filbert street, north side, west house line of Fayette		9	6		14		1							1	
Filbert street, south side, 186 feet west of west house line of Tenth		9	6		14		1							1	
Filbert street, north side, 206 feet east of east house line of Thirteenth		9	6		14		1						1		
Filbert street, north side, 210 feet east of east house line of Forty-first		24	6				1					1			
Fortieth street, east side, 124 feet north of north house line of Powelton avenue		24	12		15		1							1	
Fortieth street, east side, 23 feet south of Pennsylvania Railroad bridge		24	6				1							1	
Forty-fifth street, east side, 227 feet north of north house line of Parrish		34	6		14		1						1		
Forty-first street, east side, 12 feet south of south house line of Ogden		24	6		18		1							1	
Forty-fourth street, east side 58 feet north of north house line of Aspen		24	6		20		1							1	
Forty-ninth street, west side, 59 feet south of south house line of Greenway avenue		27	6		20		1							1	
Forty-third street, west side, 185 feet south of south house line of Fairmount avenue		24	6		13	7	1						1		
Front street, west side, 5 feet south of south house line of Coombes Alley		6	8								1				1

Fire Hydrants Renewed—Second District—*Continued.*

Street.	Location.	Ward.	Size of Main.		6-Inch Connection.		Style.							
							Taken out.				Put in.			
			Old.	New.	Feet.	In.	O. S.	No. 1.	No. 2.	No. 3.	O. S.	No. 1.	No. 2.	No. 3.
Girard avenue, north side, 22 feet 6-inches west of west house line of Fifty-first		34	6		20	8	1					1		
Haverford street, south side, 167 feet east of east house line of Sixty-fourth		34	12				1				1			
Lancaster ave., northeast side, 30 feet southeast of southeast house line of Westminster		34	6		25		1						1	
Lancaster avenue, southwest side, 144 feet east of east house line of Peach		34	6		13	8	1						1	
Lombard street, south side, west house line of Hurst		5	6		14		1					1		
Lombard street, south side, west house line of Hurst		5	6					1				1		
Lombard street, north side, 128 feet east of east house line of Eleventh		7	6		13		1						1	
Lombard street, north side, east house line of Quince		7	6		14		1						1	
Lombard street, south side, 169 feet east of east house line of Sixteenth		7	6		14		1						1	
Lombard street, north side, 210 feet west of west house line of Sixteenth		7	6		14		1						1	
Lombard street, south side, 32 feet west of west house line of Seventeenth		7	6		14		1						1	
Lombard street, north side, 199 feet west of west house line of Eighteenth		7	6		14			1				1		
Lombard street, south side, 199 feet east of east house line of Twentieth		7	6		14		1						1	
Lombard street, south side, 144 feet west of west house line of Twentieth		7	6		14		1						1	
Lombard street, south side, 192 feet east of east house line of Twenty-second		7	6		14		1						1	

FIRE HYDRANTS RENEWED—SECOND DISTRICT—*Continued.*

Street.	Location.	Ward.	Size of Main.		6-Inch Connection.		Style.								
							Taken out.					Put in.			
			Old.	New.	Feet.	In.	O. S.	No. 1.	No. 2.	No. 3.	No. 5.	O. S.	No. 1.	No. 2.	No. 3.
Lombard street, north side, 6 feet east of east house line of Kerr		7	6		14		1							1	
Lombard street, north side, 35 feet west of west house line of Twenty-fourth		7	6		14		1							1	
Market street, north side, 12 feet west of west house line of Deleware avenue		6	6							1				1	
Market street, north side, northeast corner of Front		6	6							1				1	
Market street, north side, 54 feet east of east house line of Thirtieth		24	12				1					1			
New street, south side, 218 feet west of west house line of Front		6	6		2					1				1	
New street, north side, 193 feet east of east house line of Third		6	6							1				1	
Nineteenth street, east side, 144 feet north of north house line of Walnut		8	6		14		1						1		
Nineteenth street, west side, 117 feet south of south house line of Chestnut		8	6		14		1						1		
Parrish street, north side, 27 feet west of west house line of Thirty-ninth		24	6		14		1							1	
Parrish street, north side, 222 feet east of east house line of Forty-first		24	6		14		1						1		
Pine street, north side, 199 feet west of west house line of Broad		7	6		14		1							1	
Powelton ave., south side, 17 feet west of west house line of Thirty-ninth		24	6				1					1			
Race street, northeast corner of Third		6	6								1			1	
Race street, south side, 200 feet west of west house line of Tenth		10	6		14		1						1		

Fire Hydrants Renewed—Second District—*Continued.*

Street.	Location.	Ward.	Size of Main.		6-Inch Connection.		Style.							
							Taken out.				Put in.			
			Old.	New.	Feet.	In.	O. S.	No. 1.	No. 2.	No. 3.	O. S.	No. 1.	No. 2	No. 3.
Race street, north side, 129 feet east of east house line of Fifteenth		10	6		14		1					1		
Ranstead street, north side, 109 feet east of east house line of Fifth		6	4				1				1			
Rockland street, north side, 88 feet east of east house line of Thirty-fourth		24	4		11		1						1	
Sansom street, south side, east house line of Seventh		5	6							1			1	
Sansom street, south side, 174 feet west of west house line of Ninth		6	6		11		1					1		
Sansom street, north side, 164 feet east of east house line of Eleventh		8	6		11		1					1		
Sansom street, north side, 188 feet east of east house line of Twelfth		8	6				1					1		
Seventeenth street, east side, south house line of Chancellor		8	6		14	8	1						1	
Seventeenth street, west side, south house line of Moravian		8	6		20		1					1		
Sixteenth street, east side, 141 feet south of south house line of Chestnut		8	6		14		1					1		
Sixteenth street, west side, 2 feet north of north house line of Barker		9	6		8		1						1	
Spruce street, south side, 191 feet west of west house line of Third		5	10		13		1					1		
Spruce street, south side, 5 feet west of west house line of Griscom		5	10		14		1					1		
Spruce street, north side, 164 feet east of east house line of Sixth		5	10		14		1					1		
Spruce street, north side, 190 feet 6 inches west of west house line of Seventh		8	10		14		1					1		

Fire Hydrants Renewed—Second District—*Continued.*

Street.	Location.	Ward.	Size of Main.		6-Inch Connection.		Style.							
							Taken out.				Put in.			
			Old.	New.	Feet.	In.	O. S.	No. 1.	No. 2.	No. 3.	O. S.	No. 1.	No. 2.	No. 3.
Thirty-ninth street, west side, south house line of Melon		24	6		17		1						1	
Thirty-sixth street, east side, 61 feet south of south house line of Filbert		24	6				1				1			
Twenty-second street, northwest corner of Arch		10	12							1			1	
Union street, north side, 185 feet west of west house line of Front		5	4				1				1			
Vine street, south side, 198 feet west of west house line of Sixteenth		10	12		8		1						1	
Woodland avenue, north side, 262 feet west of west house line of Thirty-second		27	8		21	4	1						1	
Woodland avenue, northwest side, 34 feet west of west house line of Forty-eighth		27	6		11		1						1	
Wallace street, south side, 23 feet west of west house line of Forty-three-and-a-half		24	6		14		1						1	
Walnut street, south side, 149 feet west of west house line of Front		5	12		7		1						1	
Walnut street, north side, 124 feet east of east house line of Third		5	6				1				1			
Walnut street, north side, 186 feet east of east house line of Fourth		5	6		6	9	1						1	
Walnut street, south side, 121 feet east of east house line of Fifth		5	12		7	2	1					1		
Walnut street, south side, west house line of Dean		8	12		14	8	1						1	
Walnut street, south side, 287 feet east of east house line of Thirty-sixth		27	10		23		1						1	
Walnut street, south side, 67 feet west of west house line of St. Marks' place		27	6				1				1			

FIRE HYDRANTS RENEWED—SECOND DISTRICT—*Continued.*

Street.	Location.	Ward.	Size of Main.		6-Inch Connection.		Style.								
							Taken out.					Put in.			
			Old.	New.	Feet.	In.	O. S.	No. 1.	No. 2.	No. 3.	No. 5.	O. S.	No. 1.	No. 2.	No. 3.
Walnut street, north side, 116 feet west of west house line of Fiftieth		27	6	.....	.....	.....	1	.....	.....	.....	.....	1	.....	.....	.....
Water street, west side, 335 feet north of north house line of Market		6	6	.....	5	.....	1	.....	.....	.....	.....	.....	1	.....	.....
Westminster avenue, south side, 23 feet 6 inches west of west house line of Fifty-fifth		24	12	.....	18	9	1	.....	.....	.....	.....	.....	.....	1	.....
Westminster avenue, north side, 99 feet east of house line of Forty-fourth		24	12	.....	27	8	1	.....	.....	.....	.....	.....	.....	1	.....
Total		.....	.....	.....	1,014	2	88	2	2	12	4	14	25	64	5

FIRE HYDRANTS RENEWED.

THIRD DISTRICT.

Street.	Location.	Ward.	Size of Main.		6-Inch Connection.		Style.							
							Taken out.				Put in.			
			Old.	New.	Feet.	In.	O. S.	No. 1.	No. 2.	No. 3.	O. S.	No. 1.	No. 2.	No. 3.
Adrian street, east side, 78 feet south of south house line of Master		17	3	.....	4	7	1	.....	.....	.....	.....	1		
Almond street, east side, south house line of Adam		25	6	.....	.....	.....	.....	.....	.....	1	.....	1		
Aramingo street, south side, 2 feet west of west house line of Sepviva		31	6	.....	5	4	1	.....	.....	.....	.....	1		
Beach street, west side, 95 feet north of north house line of Noble		11	4	.....	15	10	1	.....	.....	.....	.....	.....	1	
Beach street, northw'st side, 14 ft. 6 in. southwest of southwest house line of Shackamaxon		18	10	.....	9	6	1	.....	.....	.....	.....	.....	1	
Braddock street, west side, 239 feet 10 inches south of south house line of Lehigh avenue		25	6	.....	14	2	1	.....	.....	.....	.....	1		
Bridge street, north side, 45 feet east of east house line of Jackson		23	6	.....	.....	.....	1	.....	.....	.....	1	.....		
Cadwallader street, west side, 146 feet south of south house line of Master		17	4	.....	2	8	1	.....	.....	.....	.....	1		
Canal street, southe'st side, 137 feet southwest of southwest house line of Germantown ave.		16	6	.....	.....	.....	1	.....	.....	.....	1	.....		
Canal street, east side, 279 feet north of north house line of George		16	6	.....	11	10	1	.....	.....	.....	.....	1		
Callowhill street, north side, 126 feet 6 inches east of east house line of Second		11	10	.....	16	.....	1	.....	.....	.....	.....	.....	1	
Callowhill street, north side, 40 feet 8 inches east of east house line of Third		11	10	.....	16	.....	1	.....	.....	.....	.....	.....	1	
Dauphin street, south side, east house line of Lawrence		19	6	.....	14	3	1	.....	.....	.....	.....	.....	1	
Emerald street, west side, south house line of Westmoreland		25	6	.....	16	8	1	.....	.....	.....	.....	.....	1	

Fire Hydrants Renewed—Third District—*Continued.*

Street.	Location.	Ward.	Size of Main.		6-Inch Connection.		Style.							
							Taken out.				Put in.			
			Old.	New.	Feet.	In.	O. S.	No. 1.	No. 2.	No. 3.	O. S.	No. 1.	No. 2.	No. 3.
Fifth street, west side, south house line of Columbia avenue		19	6	.....	18	6	1	.....	.....	.....	.....	.....	1	
Frankford ave., northw't side, 400 feet northe't of north house line of Wheatsheaf lane		25	12	.....	27	8	1	.....	.....	.....	.....	.....	1	
Frankford avenue, southeast side, 340 feet 4 inches southeast of connecting railroad		25	12	.....	.....	.....	1	.....	.....	.....	.....	.....	1	
Front street, west side, 193 feet south of south house line of Callowhill		11	8	.....	17	3	1	.....	.....	.....	.....	.....	1	
Front street, east side, 33 feet 7 inches north of north house line of Noble		11	10	.....	18	7	1	.....	.....	.....	.....	.....	1	
Hackley street, north side, 113 feet east of east house line of Fifth		19	6	.....	11	6	1	.....	.....	.....	.....	.....	1	
Hancock street, west side, 117 feet south of south house line of Thompson		17	6	.....	15	.....	1	.....	.....	.....	.....	1		
Hope street, west side, 238 feet south of south house line of Girard avenue		16	4	.....	4	5	1	.....	.....	.....	.....	1		
Hope street, west side, 141 feet south of south house line of Master		17	6	.....	3	7	1	.....	.....	.....	.....	1		
Howard street, west side, 150 feet north of north house line of Master		17	6	.....	15	.....	1	.....	.....	.....	.....	1		
Huntingdon street, southwest side southeast house line of Jasper		31	6	.....	18	10	1	.....	.....	.....	.....	.....	1	
Jasper street, west side, 9 feet 4 inches south of south house line of Sergeant		31	6	.....	6	3	1	.....	.....	.....	.....	1		
Laurel street, south side, 188 feet west of west house line of Canal		16	4	.....	.....	.....	1	.....	.....	.....	.....	1		
Lawrence street, west side, 150 feet south of south house line of Oxford		17	6	.....	18	6	1	.....	.....	.....	.....	1		
Leithgow, west side, 217 feet north of north house line of George		16	4	6	8	4	1	.....	.....	.....	.....	1		

Fire Hydrants Renewed—Third District—*Continued.*

Street.	Location.	Ward.	Size of Main.		6-Inch Connection.		Style.							
							Taken out.				Put in.			
			Old.	New.	Feet.	In.	O. S.	No. 1.	No. 2.	No. 3.	O. S.	No. 1.	No. 2.	No. 3.
New Market street, west side, 7 feet north of north house line of Dana		11	6		16	6	1					1		
Norris street, south side, 7 feet west of west house line of Front		19	6		16	6	1					1		
Norris street, south side, 223 feet east of east house line of Memphis		18	6		12			1				1		
Norris street, north side, east house line of American		19	6		14	4	1						1	
Norris street, north side, east house line of Seventh		19	6				1						1	
Otter street, north side, 32 feet west of west house line of Sophia		11	10		15	3	1						1	
Palethorp street, east side, 125 feet north of north house line of Thompson		17	6				1					1		
Palethorp street, west side, 103 feet north of north house line of Jefferson		17	4	6	9	5	1					1		
Pepper street, north side, west house line of Trenton avenue		31	4		12	3	1						1	
Poplar street, south side, east house line of Charlotte		12	16		4	1	1						1	
Reese street, east side, 174 feet south of south house line of Cumberland		19	6		11	6	1					1		
Second street, west side, 180 feet 6 inches north of north house line of Columbia avenue		19	10		18	9	1						1	
Second street, west side, 216 feet south of south house line of Norris		19	10		19	8	1						1	
Second street, east side, south house line of Huntingdon		19	6		20	5	1						1	
Sepviva street, southeast side, 134 feet northeast of northeast house line of Norris		31	6		14		1					1		

Fire Hydrants Renewed—Third District—*Continued.*

Street.	Location.	Ward.	Size of Main.		6-Inch Connection.		Style.							
							Taken out.				Put in.			
			Old.	New.	Feet.	In.	O. S.	No. 1.	No. 2.	No. 3.	O. S.	No. 1.	No. 2.	No. 3.
Sepviva street, east side, 55 feet north of north house line of Emlen		31	4	.....	5	9	1	.....	.....	.....	.....	1	.....	.....
Sepviva street, southeast side, 10 feet southwest of southwest house line of Fox		31	6	.....	.....	.....	1	.....	.....	.....	1	.....	.....	.....
Shackamaxon street, southwest side, 118 ft. southeast of southeast house line of Wildey		18	6	.....	17	.....	1	.....	.....	.....	.....	1	.....	.....
Somerset st., northeast side, 74 ft. 8 in. northwest of northwest house line of Thompson		25	6	.....	20	6	1	.....	.....	.....	.....	.....	1	.....
Susquehanna ave, southwest side 124 ft. 4 in. southeast of southeast house line of Coral		31	6	.....	14	.....	1	.....	.....	.....	.....	.....	1	.....
Susquehanna avenue, southwest side, 6 feet southeast of southeast house line of Moyer		18	6	.....	11	8	.....	.....	1	.....	.....	.....	1	.....
Third street west side, 125 feet north of north house line of George		16	6	.....	3	10	1	.....	.....	.....	.....	1	.....	.....
Total		.....	.....	.....	567	8	48	1	1	1	3	24	24	.....

FIRE HYDRANTS RENEWED.

Fourth District.

Street. Location.	Ward.	Size of Main.		6-Inch Connection.		Style.								
						Taken out.					Put in.			
		Old.	New.	Feet.	In.	O. S.	No. 1.	No. 2.	No. 3.	No. 5.	O. S.	No. 1.	No. 2.	No. 3.
Arlington street, north side, 221 feet west of west house line of Seventeenth	32	6				1					1			
Broad street, east side, 71 feet 4 inches north of north house line of Willow	14	20		3		1							1	
Broad street, west side, 2 feet south of south house line of Columbia ave	29	30		6		1							1	
Callowhill street, north side, 88 feet west of west house line of Sixth on Market plot	13	6				1					1			
Callowhill street, north side, 15 feet west of west house line of Nineteenth	15	10		3		1						1		
Diamond street, southwest corner Fifteenth	32	6											1	
East Fairmount Park, south side of east park reservoir	29	6				1			1		1			
Eleventh street, west side, 7 feet 4 inches south of south house line of Hamilton	14	10				1							1	
Fairmount ave., north side, 5 feet west of west house line of Seventeenth	15	10								1			1	
Fifteenth street, west side, 3 feet south of north house line of Callowhill	15	6		3	6	1					1			
Girard avenue, north side, west house line of Thirty-first	29	10						1					1	
Girard ave., south side, 11 feet east of east house line of Taney	29	10						1					1	
Green street, north side, 193 feet 5 inches west of west house line of Eighteenth	15	6		16	4	1						1		
Hutchinson street, west side, 82 feet 3 inches south of south house line of Girard ave	20	4		11	8	1						1		

Fire Hydrants Renewed—Fourth District—*Continued.*

Street.	Location.	Ward.	Size of Main.		6-Inch Connection.		Style.								
							Taken out.					Put in.			
			Old.	New.	Feet.	In.	O. S.	No. 1.	No. 2.	No. 3.	No. 5.	O. S.	No. 1.	No. 2.	No. 3.
Mervine street, east side, north house line of Columbia ave		20	6		8		1							1	
Pennock street, southeast corner of Poplar		15	6							1				1	
Ridge av., southwest side, 45 feet 10 inches northwest of north house line of Vineyard		29	16		6	5	1						1		
Spring Garden street, north side, 177 feet west of west house line of Ninth		13	6		11	5	1							1	
Spring Garden street, south side, 133 ft. 3 in. west of west house line of Twenty-first		15	10		3	9	1							1	
Sydenham street, east side, 12 feet south of south house line of Clearfield		28	6						1					1	
Taney street, southwest corner of Montgomery avenue		29	6							1				1	
Thirteenth street, west side, south house line of Oxford		20	6		13	11	1							1	
Thirty-fifth street, southwest corner of Clearfield		28	6							1				1	
Thirty-third street, west side, north house line of Pennsylvania avenue		29	6						1					1	
Twelfth street, east side, 8 feet 8 inches south of south house line of Columbia ave		20	6		14	8	1							1	
Twelfth street, east side, 79 feet 6 inches south of south house line of Norris		32	6				1					1			
Twenty-second street, east side, 15 feet north of north house line of Diamond		32	6		17	6	1							1	
Twenty-fifth street, west side, 6 feet south of south house line of Montgomery ave		29	10		13		1							1	
Total					132	2	19		4	4	1	5	4	19	

FIRE HYDRANTS RENEWED.

Fifth District.

Street.	Location.	Ward.	Size of Main.		6-Inch Connection.		Style.							
							Taken out				Put in.			
			Old.	New.	Feet.	In.	O. S.	No. 1.	No. 2.	No. 3.	O. S.	No. 1.	No. 2.	No. 3.
Chestnut street, northeast side, 12 feet southeast of southeast house line of Church		21	6	.....	10	.....	1	.....	.....	.....	.....	.....	1	
Freeland avenue, southwest side, 20 feet southeast of southeast house line of Penn		21	6	.....	.....	.....	1	.....	.....	.....	.....	.....	1	
Hamilton street, southwest side, 15 feet southeast of northwest house line of Baldwin		21	6	.....	3	.....	1	.....	.....	.....	.....	.....	1	
Levering street, northwest side, 5 feet northeast of northeast house line of Cresson		21	6	.....	9	6	1	.....	.....	.....	.....	.....	1	
Ridge avenue, northeast side, 50 feet southe'st of southe'st house line of Old Ferry Road		28	6	.....	.....	.....	1	.....	.....	.....	1			
Ridge avenue, southwest side, 305 feet northwest of northwest house line of Bridge		28	6	.....	.....	.....	.....	.....	.....	1	.....	.....	1	
Ridge avenue, northeast side, 128 feet southeast of southeast house line of Dawson		21	6	.....	8	.....	1	.....	.....	.....	.....	.....	1	
Ridge avenue, southw't side, 720 feet southe'st of southe'st house line of Williams' lane		21	20	.....	.....	.....	1	.....	.....	.....	1			
Ridge avenue, northe't side, 291 feet northw't of northw't house line of Shawmont ave		21	10	.....	.....	.....	1	.....	.....	.....	.....	.....	1	
Queen lane, northwest side, 30 feet southwest of southwest house line of Krail		28	6	.....	15	.....	1	.....	.....	.....	.....	.....	1	
Total		.....	.....	.....	45	6	9	.....	.....	1	2	.....	8	

FIRE HYDRANTS RENEWED.

SIXTH DISTRICT.

Street.	Location.	Ward.	Size of Main.		6-Inch Connection.		Style.							
							Taken out.				Put in.			
			Old.	New.	Feet.	In.	O. S.	No. 1.	No. 2.	No. 3.	O. S.	No. 1.	No. 2.	No. 3.
Brunner street, southeast side, 14 ft. 8 inches northeast of northeast house line of Wayne		22	6	.....	3	.....	1	.....	.....	.....	.....	1	.....	.....
Chelten avenue, southeast side, 91 feet 4 inches southwest of Reading Railroad		22	6	.....	23	7	1	.....	.....	.....	.....	.....	1	.....
Chelten avenue, northwest side, 285 feet 10 inches northeast of Germantown avenue		22	6	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	1
Chew street, southwest side, southeast house line of Woodbine avenue		22	6	.....	18	4	1	.....	.....	.....	.....	.....	1	.....
Chew street, southwest side, 287 feet northwest of northwest house line of Penn		22	3	6	22	.....	1	.....	.....	.....	.....	1	.....	.....
Dounton street southeast side, 562 feet northeast of northeast house line of Germant'n av		33	6	.....	.....	.....	.....	1	.....	.....	.....	1	.....	.....
Germantown avenue, northeast side, 41 feet southeast of southeast house line of McFerran		33	6	.....	31	2	1	.....	.....	.....	.....	1	.....	.....
Germantown ave., northeast side, 7 ft. 6 in. southeast of southeast house line of Howard st		33	6	.....	36	.....	1	.....	.....	.....	.....	1	.....	.....
Germantown avenue, northeast side, 93 feet southeast of southeast house line of Barr st		33	6	.....	31	.....	1	.....	.....	.....	.....	1	.....	.....
Green street, northeast side, 96 feet 7 inches northwest of northwest house line of Johnson		22	16	.....	5	6	1	.....	.....	.....	.....	1	.....	.....
Green street, northeast side, 7 ft. 8 in. southeast of southeast house line of Washington av		22	16	.....	4	6	1	.....	.....	.....	.....	.....	1	.....
Haines street, southeast side, northeast house line of Engle		22	6	.....	12	.....	1	.....	.....	.....	.....	1	.....	.....
Harvey street, northwest side, southwest house line of lower Adams		22	4	10	10	6	1	.....	.....	.....	.....	.....	1	.....
Harvey street, southeast side, 38 ft 3 in. northeast of northeast house line of upper Adams		22	4	10	17	.....	1	.....	.....	.....	.....	.....	1	.....
Locust avenue, northwest side, southwest house line of Chew street		22	4	6	15	10	1	.....	.....	.....	.....	.....	1	.....

Street.	tion.	Ward.	Size of Main. Old.	Size of Main. New.	6-Inch Connection. Feet.	6-Inch Connection. In.	Style. Taken out. O. S.	Taken out. No. 1.	Taken out. No. 2.	Taken out. No. 3.	Put in. O. S.	Put in. No. 1.	Put in. No. 2.	Put in. No. 3.
Meehan avenue, northwest side 346 feet northeast of northeast house line of Musgrove		22	6	.....	.....	.....	1	.....	.....	.....	.....	1	.....	.....
Meehan ave, northwest side, 239 ft. northeast of northeast house line of Germantown av		22	6	.....	17	.....	1	.....	.....	.....	.....	1	.....	.....
Price street, southeast side, 377 feet northeast of northeast house line of Hancock		22	4	6	18	.....	1	.....	.....	.....	.....	1	.....	.....
Rittenhouse street, 290 feet southwest of southwest house line of Germantown avenue		22	6	.....	.....	.....	1	.....	.....	.....	1	.....	.....	.....
Tioga street, north side, 183 feet 10 inches west of west house line of seventeenth		28	6	.....	11	6	1	.....	.....	.....	.....	1	.....	.....
Tulpehocken street, southeast side, 759 feet northeast of northeast house line of Morton		22	4	6	16	.....	1	.....	.....	.....	.....	1	.....	.....
Tulpehocken st., northwest side, 631 ft. 5 in. southwest of southwest house line of Green		22	10	.....	21	6	1	.....	.....	.....	.....	1	.....	.....
Twelfth street, east side, 133 feet south of south house line of Rising Sun lane		28	6	.....	19	.....	1	.....	.....	.....	.....	.....	1	.....
Wakefield street, southw't side, 63 feet southeast of southeast house line of East Jefferson		22	4	6	14	.....	1	.....	.....	.....	.....	1	.....	.....
Wakefield street, northeast side, 15 feet northwest of southeast house line of W. Ashmead		22	4	6	13	3	1	.....	.....	.....	.....	1	.....	.....
Wakefield street, northeast side, 198 feet 6 in. southeast of southeast house line of Penn		22	4	6	13	4	1	.....	.....	.....	.....	1	.....	.....
Wayne street, northeast side, 1 foot southeast of southeast house line of Lafayette		22	6	.....	19	7	1	.....	.....	.....	.....	.....	1	.....
Westview street, southwest side, 2 feet northeast of northeast house line of Emlen		22	6	.....	.....	.....	.....	.....	1	.....	.....	.....	1	.....
Wister street, northwest side, 5 feet 4 inches southwest of southwest house line of Miller		22	6	.....	7	4	1	.....	.....	.....	.....	1	.....	.....
Total		.....	.....	.....	400	11	26	1	2		1	18	9	1

Recapitulation of Fire Hydrants Set, Renewed and Removed.

	Districts.	Style.					Total.
		Old.	No. 1. 1 Way.	No. 2, 2 Way,	No. 3, 3 Way.	No. 5, 5 Way.	
Set.	First	.....	41	42	1	.....	84
	Second	.....	18	75	.....	.....	93
	Third	1	23	118	.....	.....	142
	Fourth	.....	41	176	.....	.....	217
	Fifth	.....	.....	12	.....	.....	12
	Sixth	2	21	49	2	.....	74
	Total	3	144	472	3		622
Renewed.	First	.....	20	22	.....	.....	42
	Second	14	25	64	5	.....	108
	Third	3	24	24	.....	.....	51
	Fourth	5	4	19	.....	.....	28
	Fifth	2	.....	8	.....	.....	10
	Sixth	1	18	9	1	.....	29
	Total	25	91	146	6		268
	Total of new hydrants	28	235	618	9		890
Removed.	First	37	.....	.....	2	.....	39
	Second	39	1	1	.....	.....	41
	Third	73	2	1	2	.....	78
	Fourth	124	.....	2	5	1	132
	Fifth	2	.....	.....	.....	.....	2
	Sixth	14	.....	.....	.....	.....	14
	Total	289	3	4	9	1	306
	Total added during 1890						316

FIRE HYDRANTS BY PURVEYORS' DISTRICTS.

Districts.	Style.						Totals.
	Old.	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.	
First	673	166	329	206	.....	.....	1,374
Second	1,046	174	400	190	1	31	1,842
Third	1,077	180	407	199	2	.....	1,865
Fourth	628	130	429	236	1	4	1,428
Fifth	231	21	90	11	.....	.....	353
Sixth	438	166	174	109	.....	.....	887
Totals	4,093	837	1,829	951	4	35	7,749

FIRE HYDRANTS BY WARDS.

Wards.	Style.						Totals.
	Old.	No 1.	No. 2.	No. 3.	No. 4.	No. 5.	
First	214	50	60	44	.....	.....	368
Second	81	23	53	30	.....	.....	187
Third	52	11	21	11	.....	.....	95
Fourth	53	8	15	24	.....	.....	100
Fifth	82	20	31	31	.....	3	167
Sixth	49	10	32	36	1	5	133
Seventh	94	10	43	15	.....	1	163
Eighth	83	22	49	20	.....	3	177
Ninth	57	21	51	22	.....	3	154
Tenth	59	25	34	13	.....	8	139
Eleventh	53	7	15	1	.....	1	77
Twelfth	62	3	11	10	.....	.....	86
Thirteenth	66	9	33	16	.....	.....	124
Fourteenth	58	7	26	19	.....	.....	110
Fifteenth	125	36	77	67	1	2	308
Sixteenth	46	9	25	8	1	.....	89
Seventeenth	56	16	21	9	.....	.....	102
Eighteenth	125	16	34	21	.....	.....	196
Nineteenth	174	34	85	38	.....	.....	331
Twentieth	129	17	69	27	.....	.....	242
Twenty-first	204	17	81	10	.....	.....	312
Twenty-second	352	134	132	83	.....	.....	701
Twenty-third	165	17	35	21	.....	.....	238
Twenty-fourth	260	25	63	16	.....	1	364
Twenty-fifth	191	35	74	16	.....	.....	316
Twenty-sixth	158	55	114	71	.....	.....	398
Twenty-seventh	236	29	57	19	.....	3	344
Twenty-eighth	156	40	148	65	.....	.....	409
Twenty-ninth	130	27	79	46	.....	1	283
Thirtieth	101	17	61	24	.....	.....	203
Thirty-first	96	19	42	27	.....	.....	184
Thirty-second	63	13	39	25	.....	1	141
Thirty-third	127	41	74	56	1	.....	299
Thirty-fourth	136	14	45	10	.....	3	208
Totals	4,093	887	1,829	951	4	35	7,749

STATEMENT OF THE NUMBER OF FIRE HYDRANTS BY DISTRICTS AND WARDS,

During 1890, and total previous thereto.

	FIRST DISTRICT.							SECOND DISTRICT.									
	Wards.						Total.	Wards.									Total.
	1	2	3	4	26	30		5	6	7	8	9	10	24	27	34	
Prior to 1890	...	...	...	...	...	...	1,326	...	...	...	...	...	...	...	...	...	1,793
During 1890	34	9	3	...	29	9	84	2	4	5	10	2	5	16	22	27	93
Total	...	...	...	...	...	...	1,410	...	...	...	...	...	...	...	...	...	1,886
Taken out in 1890	...	...	...	...	...	...	39	...	...	...	...	...	...	...	...	...	41
Total in city	...	...	...	...	...	...	1,371	...	...	...	...	...	...	...	...	...	1,845

	THIRD DISTRICT.													FOURTH DISTRICT.							
	Wards.												Total.	Wards.							Total.
	11	12	16	17	18	19	20	23	25	28	31	33		13	14	15	20	28	29	32	
Prior to 1890	...	...	...	...	...	...	...	...	...	...	...	...	1,801	...	...	...	...	...	...	...	1,343
During 1890	5	1	8	4	11	22	...	9	33	...	10	39	142	16	14	43	28	52	44	20	217
Total	...	...	...	...	...	...	...	...	...	...	...	...	1,943	...	...	...	...	...	...	...	355
Taken out in 1890	...	...	...	...	...	...	...	...	...	...	...	...	78	...	...	...	...	...	...	...	132
Total in city	...	...	...	...	...	...	...	...	...	...	...	...	1,865	...	...	...	...	...	...	...	1428

	FIFTH DIST.			SIXTH DIST.				Total.
	Wards		Total.	Wards.			Total.	
	22	28		22	28	33		
Prior to 1890	...	...	343	...	...	...	827	7,433
During 1890	10	2	12	47	20	7	74	622
Total	...	...	...	...	...	...	901	8,055
Taken out in 1890	...	...	2	...	...	...	14	306
Total in city	...	...	353	...	...	...	887	7,749

Number of attachments for fire purposes previously reported 387

Made during 1890:
- First District 1
- Second District 1
- Third District 3
- Fourth District 2
- Fifth District 1
- Sixth District 0

Total 395

ATTACHMENTS, ETC., MADE BY THE PURVEYORS,

In accordance with permits issued by the Bureau of Water.—Arranged by month.

Months.	New Attachments.							Shut-offs by Permit.							Work done without Permit.					
	Size.											Repairs.			Drawn.					
	½ inch.	⅝ inch.	¾ inch.	1 inch.	1½ inch.	2 inch.	Total.	Reamed for larger attachment.	Re-drive.	Discontinued.	Transfer.	Not drawn.	Drawn and re-driven.	Total.	Discontinued and abandoned.	Duplicate.	Delinquent.	Leaks.	Total.	Drawn and re-driven.
January	101	1	.....	7	2	2	113	.....	30	5	.....	2	6	43	2	.....	.....	20	22	.....
February	144	3	1	3	1	2	154	1	12	1	.....	.....	20	34	1	.....	.....	10	11	.....
March	421	8	9	6	1	4	449	6	13	21	1	2	16	59	.....	.....	.....	19	19	.....
April	730	20	24	26	1	6	807	12	49	16	3	.....	20	100	14	.....	.....	13	27	51
May	922	23	26	14	5	3	993	20	21	22	5	7	45	120	15	.....	.....	15	30	49
June	757	27	19	17	3	2	825	20	12	11	4	2	42	91	12	.....	.....	19	31	74
July	928	33	27	21	2	1	1,017	19	11	8	1	.....	32	71	7	.....	.....	11	18	129
August	1,011	20	13	26	3	5	1,078	14	8	8	3	.....	27	60	9	.....	.....	16	25	121
September	1,185	101	18	12	3	2	1,321	24	17	27	1	1	31	101	15	2	.....	11	28	17
October	1,013	58	11	11	6	4	1,103	13	22	25	1	2	28	91	28	.....	.....	30	58	20
November	1,292	119	13	18	1	10	1,453	13	22	37	2	.....	35	109	2	.....	1	27	30	4
December	744	8	3	6	2	5	768	2	14	35	1	.....	20	72	5	.....	3	25	33	.....
Totals	9,248	426	164	167	30	46	10,081	144	231	216	22	16	322	951	110	2	4	216	332	465

ATTACHMENTS, ETC., MADE BY THE PURVEYORS,

In accordance with permits issued by the Bureau of Water.

Arranged by Districts.

Districts.	New Attachments.							Shut-offs by Permits.							Work done without Permit.					
	Size.											Repairs.			Drawn.					
	½ inch.	⅝ inch.	¾ inch.	1 inch.	1½ inch.	2 inch.	Total.	Reamed for larger attachments.	Re-drive.	Discontinued.	Transfer.	Not Drawn.	Drawn and re-driven.	Total.	Discontinued and Abandoned.	Duplicate.	Delinquent.	Leak.	Total.	Drawn and re-driven.
First	2,157	47	25	20	7	2	2,258	.....	31	33	3	.....	31	98	8	.....	.....	42	50	23
Second	1,670	109	50	32	8	12	1,881	55	52	100	2	.....	73	282	24	.....	2	54	80	102
Third	2,109	28	37	60	3	26	2,263	.....	76	43	5	.....	77	201	66	2	.....	58	126	43
Fourth	2,215	105	38	30	7	5	2,400	84	56	28	3	14	111	296	8	.....	.....	60	68	25
Fifth	346	4	2	7	.....	.....	359	.....	8	2	5	2	16	33	1	.....	2	2	5	24
Sixth	751	133	12	18	5	1	920	5	8	10	4	.....	14	41	3	.....	.....	.....	3	248
Totals	9,248	426	164	167	30	46	10,081	144	281	216	22	16	322	951	110	2	4	216	332	465

Account of New Stops for 1890.

Districts.	Bureau of Water.		Viney.				Total.
	2-Way.	Butterfly.	2-Way.	3-Way.	4-Way.	5-Way.	
First	160						160
Second	139						139
Third	161	5	2	54	2		224
Fourth	155	2	1				158
Fifth	49						49
Sixth	110						110
Totals	774	7	3	54	2		840

Repairs to Mains, Stops and Fire Hydrants; also, Stops and Fire Hydrants Removed during 1890.

Districts.	Repairs to Mains.	Stops.			Fire Hydrants.		
		Repaired	Renewed	Removed	Repaired	Renewed	Removed
First	47	289	50	5	523	42	39
Second	53	328	35	1	401	108	41
Third	202	586	32	6	330	51	78
Fourth	287	553	7	17	991	28	132
Fifth	13	33	12		21	10	2
Sixth	54	41	37	1	33	29	14
Totals	656	1830	173	30	2299	268	306

Number of Complaints and Examinations during 1889 and 1890.

Months.	Hydrants.		Service Pipes.		Wash Paves.		Spigots.		Water Closets.		Horse Troughs.		No Leaks.		Total.	
	1889.	1890.	1889.	1890.	1889.	1890.	1889.	1890.	1889.	1890.	1889.	1890.	1889.	1890.	1889.	1890.
January	119	94	79	52	10	1	6	1	2	2	2	3	52	15	270	168
February	138	90	80	47	31	.....	4	2	2	1	4	4	23	16	282	160
March	102	90	47	58	17	.....	2	3	3	.....	5	3	36	34	212	188
April	97	72	43	47	4	3	5	1	2	.....	1	2	37	30	189	155
May	148	106	63	70	5	2	.....	1	.....	2	7	7	79	69	302	257
June	130	96	48	67	4	5	1	.....	.....	4	3	13	69	58	255	243
July	144	124	57	81	5	3	6	2	.....	.....	6	.....	78	74	296	284
August	150	102	71	77	5	3	4	2	.....	.....	4	3	46	56	280	243
September	108	118	59	86	2	6	3	3	.....	1	.....	3	44	57	216	274
October	194	111	53	76	2	2	4	3	2	1	1	3	45	66	301	267
November	128	89	66	104	3	10	5	5	.....	3	1	3	56	47	259	261
December	117	163	47	107	1	6	5	3	1	3	5	1	27	52	203	335
Totals	1,575	1.255	713	872	89	41	45	26	12	17	39	50	592	574	3,065	2,835

NUMBER OF VALVES RAISED IN THE SEVERAL DISTRICTS DURING THE YEAR 1890.

Also, in each year since 1873.

Districts.	6-inch Barton.	8-inch Barton.	6-inch Viney.	3-inch.	4-inch.	6-inch.	8-inch.	10-inch.	12-inch.	16-inch.	20-inch.	30-inch.	36-inch.	Total.
First	4	.....	.....	.....	.....	2	.....	.....	.....	1	.....	.....	.....	7
Second	1	.....	.....	3	3	11	.....	2	1	.....	.....	.....	.....	21
Fourth	3	3	.....	.....	20	55	.....	5	.....	.....	.....	.....	.....	86
Totals for 1890	8	3	.....	3	23	68	.....	7	1	1	.....	.....	.....	114
" 1889	15	.....	2	4	23	73	.....	4	1	1	.....	1	.....	124
" 1888	6	.....	.....	8	26	74	.....	10	1	2	.....	1	.....	128
" 1887	11	.....	.....	11	16	61	.....	10	3	4	2	1	1	120
" 1886	12	.....	.....	13	18	57	1	3	.....	.....	.....	1	.....	105
" 1885	.....	.....	.....	11	24	97	1	9	.....	2	.....	1	.....	145
" 1884	.....	.....	.....	7	13	71	1	4	2	1	3	6	1	109
" 1883	.....	.....	.....	4	27	88	.....	8	.....	1	.....	1	1	130
" 1882	.....	1	.....	14	25	58	1	5	1	.....	.....	1	.....	106
" 1881	.....	.....	.....	15	44	90	.....	5	7	.....	.....	.....	.....	161
" 1880	.....	.....	.....	7	23	47	.....	8	1	.....	.....	1	.....	87
" 1879	.....	.....	.....	9	16	60	1	3	2	.....	.....	1	1	93
" 1878	.....	.....	.....	27	22	100	.....	3	1	.....	1	1	.....	155
" 1877	.....	.....	.....	12	6	50	.....	1	.....	.....	1	.....	.....	70
" 1876	.....	.....	.....	3	17	49	.....	3	.....	.....	1	.....	.....	73
" 1875	.....	.....	.....	17	55	120	4	12	2	4	1	2	.....	217
" 1874	.....	.....	.....	13	32	111	6	6	3	3	.....	.....	.....	174
Totals for 17 years	52	4	2	178	410	1274	15	101	25	19	9	18	4	2111

TABULAR STATEMENT OF WORK CONNECTED WITH THE DISTRIBUTION,

For the 11 years, 1880 to 1890, inclusive.

ars.	Pipe.										Additional stops.	Additional fire hydrants.	Fire hydrants in use.	Meters in use.	Service Attachments.						
	Extensions.		Repairs and relays.		Total pipe handled.		Total amount in use.		Total amount handled.						½ in.	⅝ in.	¾ in.	1 in.	1½ in.	2 in.	Total.
	Feet.	Pounds.	Feet.	Pounds.	Feet.	Pounds.	Feet.	Pounds.	Feet.	Pounds.											
80.....	23,085	844,946	9,557	262,826	32,642	1,107,772	3,927,623	192,816,906	4,164,768	200,136,708	138	70	5,358	34	2,687	118	49	89	.....	.....	2,913
81.....	56,616	2,832,623	3,832	199,649	60,448	3,032,272	3,981,239	195,649,529	4,225,216	203,168,980	249	144	5,502	42	3,166	137	59	121	.....	.....	3,483
82.....	56,860	5,396,165	7,740	484,092	64,600	5,880,257	4,081,180	202,202,522	4,289,816	209,019,237	312	120	5,622	45	3,169	110	76	129	.....	.....	3,481
83.....	63,215	3,048,645	12,605	675,420	75,880	3,724,065	4,144,395	205,251,167	4,365,696	212 773,301	281	130	5.752	63	4,576	97	71	133	.....	.....	4,877
84.....	84,451	7,155,385	18,079	1,380,271	102,530	8,535,656	4,228,846	212,406,552	4,468,226	221,308,957	324	147	5,887	560	5,529	185	84	140	.....	7	5,945
85.....	137,967	12,234,074	93,783	3,265,537	231,850	15,499,611	4,366,813	224,640,526	4,700,076	236,808,568	539	307	6,195	305	6,734	254	121	160	.....	16	7,285
86.....	136,831	18,238,457	121,210	4,883,826	258,011	23,122,283	4,503,644	242,879,083	4,958,117	259,930,851	736	295	6,490	284	7,482	258	104	133	.....	32	8,009
87.....	122,790	14,780,082	34,098	1,329,083	156,888	16,109,165	4,626,434	257,659,165	5,115,005	276,040,016	546	429	6,715	253	7,892	317	124	143	2	54	8,532
88.....	133,552	6,356,379	45,943	1,486,631	179,495	7,843,010	4,759,986	264,015,544	5,294,500	283,88 3,026	772	214	6,929	267	8,260	193	139	118	23	55	8,788
89.....	147,171	12,270,311	57,836	2,410,677	205,007	14,680,988	4,907,157	276,285,855	5,499,507	298,514,014	601	247	7,433	304	8,950	263	149	119	17	46	9,544
90.....	159,176	14,164,305	70,546	3,058,294	229,722	17,222,599	5,066,333	290,450,160	5,729,229	315,736,613	840	316	7,749	.....	9,248	426	167	164	30	46	10,081

GENERAL SUMMARY OF METER OPERATIONS DURING YEAR 1890.

Size of Meter.	In use Jan. 1, 1890.						Set during 1890.			Renewed. Taken out.				Renewed. Put in.				Discontinued. Taken out.		In use December 31, 1890.						Stock on hand December 31, 1890.					Repaired.			Used in service.				Purchased during 1890.			Received on trial.	
	Crown.	Union.	Worthington.	Frost.	Thompson.	Total	Crown.	Gem.	Total.	Crown.	Worthington.	Gem.	Total.	Crown.	Worthington.	Gem.	Total.	Crown.	Total.	Crown.	Union.	Worthington.	Gem.	Frost.	Thompson.	Total.	Crown.	Worthington.	Gem.	Positive.	Total.	Crown.	Worthington.	Gem.	Total.	Crown.	Union.	Keystone.	Equitable.	Total.	Crown.	Gem.	Total.	Hersey.	Total.
½ inch.	1					1	17		17	18	2			2	6		6	22			22	22				22	11				11	33												
⅝ "					1	1				1								1			1					1					1												
¾ "	15					15	54		54	69	10		10	8		8	67	1	1	66	66					66	14			14	80	25		25			24		24					
1 "	42		3	1	1	47	54		54	101	12	2	14	7		7	94	4	4	90	87		1		1	1	90	45	23		1	69	159	37		37				2	2				
1⅓ "	62	4	2			68	22		22	90	9		9	6		6	87	5	5	82	76	4	2				82	13			1	14	96	13		13	20	4		24					
2 "	108					108	30	14	44	152	12		13	13	4	17	156	10	10	146	129		17			146	5	2	3		10	156	32	1	33	2			2	12	20	32		
3 "	37		1			38	18	10	28	66	8		8	8	4	12	70	1	1	69	54		14			69	6	2	6		14	83	11	1	12						18	20	38		
4 "	23					23	21	27	48	71	1		1		1	1	71			71	43		28			71	2		2		4	75	7		7						22	30	52	1	1
6 "	3					3	2	1	3	6*	1		1				5			5	4		1			5	1		1		2	7								1	2	3		
Totals.	291	4	6	1	2	304	218	52	270	574	55	2	1	58	48	9	57	573	21	21	552	481	4	4	60	1	2	552	97	27	12	2	138	690	125	1	1	127	2	20	28	2	52	53	72	125	1	1

Note—One ¾-inch Crown Meter, Two 1½-inch Worthington meters } in private use.

One 1-inch Frost meter, One ⅝-inch Thompson meter, One 1-inch Thompson meter } on trial.

* Temporarily removed.

The 4-inch Hersey meter received on trial returned to Hersey Meter Company.

NEW METERS SET.

Wards.	Occupant.	Location.	Date when set.	Name of meter.	Size. ½-inch.	¾-inch.	1-inch.	1½ inch.	2 inch.	3-inch.	4-inch.	6-inch.	Total.	Quantity of water used. Gallons.	Charged by schedule rates.	Charged by meter rates.	Remarks.
1	Alburger	S.S. Snyder ave., E. of Second	Dec. 19, 1890	Crown		1							1	No water used.			
1	Hopper, J.	1536-40 Anthony street	May 2, 1890	Crown		1							1	173,545	$34 00	$13 08	
1	Philadelphia Vinegar Co	1522-26 Otsego street	Dec. 19, 1890	Crown				1					1	1,933,950	50 00	154 71	
1	Rice. T. B.	N. S. Mifflin, E. of Ash street	Dec. 19, 1890	Crown		1							1	209,460	7 00	16 75	
1	Spreckles, Claus	Meadow and Reed streets	Feb. 27, 1890	Crown							1		1	8,679,610	9 00	694 36	
1	Spreckles, Claus	Meadow and Reed streets	Feb. 29, 1890	Crown								1	1				
3	Kaneosky, R.	729 Campbell street	Feb. 11, 1890	Crown				1					1	347,940	41 00	27 83	
3	Wharton, S. P.	743 South Eleventh street	July 15, 1890	Gem							1		1	31,202,600	No charge.	2,496 18	
5	Bershadskey, N.	436 Lombard street	Feb. 11, 1890	Crown				1					1	647,135	8 00	50 17	
5	Dyatt, M. A.	114 South Second street	April 5, 1890	Crown		1							1	36,321	15 00	2 90	
5	Hachnlein, J.	418-22 Library st.	April 26, 1890	Crown				1					1	302,895	15 00	24 23	
5	Kline, William	622-24 Lombard st.	Jan. 27, 1890	Crown					1				1	564,562	78 00	45 16	
5	Pennsylvania R. R. Co.	300-06 South Delaware avenue	June 19, 1890	Crown					1				1	761,445	37 00	60 91	
5	Wiler, William	223-25 South Fifth street	Mar. 26, 1890	Crown			1						1	348,435	24 00	27 87	
5	Yeaton & Harris	260 South Fifth street	April 10, 1890	Crown			1						1	72,322	8 00	7 94	
6	Allen, G. W.	402-08 Race street	April 5, 1890	Crown				1					1	1,299,847	78 00	103 98	
6	Collins estate	238 & 240 North Front street	Oct. 6, 1890	Gem					1				1	1,297,237	9 00	103 77	
6	Crowell & Clas.	50-54 North Delaware avenue	Sept. 4, 1890	Gem					1				1	3,167,475	221 00	253 39	
6	Cressman, M. A.	65 & 67 North Front street	Dec. 10, 1890	Crown		1							1	130,042	13 00	10 40	

NEW METERS SET—*Continued.*

Wards.	Occupant.	Location.	Date when Set.	Name of Meter.	Size. ½-inch.	¾-inch.	1-inch.	1½-inch	2-inch.	3-inch.	4-inch.	6-inch.	Total.	Quantity of Water Used. Gallons.	Charged by Schedule Rates.	Charged by Meter Rates.	Remarks.
6	Pfeiffer, J.	222-26 Race street	Apr. 25, 1890	Crown			1						1	5,905,747	$75 00	$472 45	
6	Uhler, T. M.	Pier 11, N. Delaware avenue	June 9, 1890	Crown					1				1	178,252	No charge.	14 26	
6	Vantine, G. W.	210-212 North Third street	Apr. 25, 1890	Crown			1						1	270,900	22 00	21 67	
7	Tracy, J. F.	N. W. 25th and Factory sts	Aug. 20, 1890	Crown				1	2				3	2,410,062	47 00	182 70	
7	Vandusen, H. R.	W. side 27th, s. of Lombard	Mar. 27, 1890	Crown			1						1	738,427	38 00	59 07	
8	Edison Electric Light Co	908-12 Sansom street	July 15, 1890	Crown	1								1	957,225	No charge.	76 57	
8	Union League	S. W. cor. Broad and Sansom	Sept. 22, 1890	Gem					1				1	152,250	No charge.	12 18	
9	Athletic Ass. S. Navy	1628 Arch street	Sept. 28, 1890	Gem					1				1	6,679,537	18 00	534 36	
9	Betts, E. S.	2042 Arch street	Apr. 25, 1890	Crown			1						1	No water used.			
9	Martindale, T. & Co	21 North Tenth street	Feb. 9, 1890	Crown						1			1	5,346,225	100 00	427 45	
9	Penna. R. R. Co	1818 Filbert street	May 26, 1890	Crown					1				1	No water used.			
9	Rowland, S. H.	1013 Chestnut street	Jan. 28, 1890	Crown				1					1	2,402,742	23 00	192 21	
10	Ledig, A. & Son	Rear 248 North Eighth street	Apr. 24, 1890	Crown			1						1	815,765	186 00	64 86	
11	Evans, E. & Co	N. E. cor. St. John and Willow	Jan. 15, 1890	Crown	1	2							3	360,165	63 00	28 81	
11	Hanna, Wm. H.	227 Buttonwood street	May 8, 1890	Crown		1							1	7,827	7 00	75	
11	Powers, Est.	700-6 N. Delaware avenue	Oct. 3, 1890	Crown		1							1	1,029,502	27 00	82 36	
11	Raesch & Sons	839-43 St. John street	July 25, 1890	Crown				1					1	1,522,275	12 50	121 78	
12	Betz, J. F. & Son	York avenue and Willow st	Oct. 7, 1890	Crown					1				1	85,197,130	2,408 00	6,815 76	
12	Raehm, J.	847-51 North Fourth street	May 11, 1890	Crown						1			1	4,760,340	149 48	380 82	

NEW METERS SET—*Continued.*

Wards	Occupant	Location	Date when Set	Name of Meter	Size								Quantity of Water Used	Charged by Schedule Rates	Charged by Meter Rates	Remarks
					½-inch.	¾-inch.	1-inch.	1½-inch.	2-inch.	3-inch.	4-inch.	6-inch.	Total.	Gallons			
13	Esslinger, G.	415-21 Rugan street	Mar. 5, 1890.	Crown			1	1					2	771,270	$49 00	$107 30	
13	Jewett, A. & Co.	906-24 Noble street	Sep. 16, 1890	Crown		1							1	7,035,412	30 00	562 83	
13	Jewett, A. & Co.	906-24 Noble street	Sep. 16, 1890.	Gem					1				1				
13	Weihman, J.	401-05 N. Tenth street	Aug. 6, 1890.	Crown					1				1	2,798,995	228 00	223 11	
13	Weihman, J.	401-05 N. Tenth street	Aug. 22, 1890	Crown		1	2						3				
14	Haines, Jones & Cadbury	1136-40 Ridge avenue	Aug. 5, 1890	Crown			1						1	1,798,110	35 00	173 84	
14	Pedrick & Ayres	1002-04 Buttonwood street	Mar. 29, 1890	Crown					1				1	1,237,935	5 00	99 03	
14	Sweeney, G.	1330-34 Ridge avenue	June 21, 1890	Crown		1							1	61,650	24 00	4 93	
15	Austin, Wm. L.	1625 Green street	Dec. 20, 1890	Crown				1					1	No water used			
15	Beswick & Kay	S. S. Callowhill, W. of 25th st.	Apr. 23, 1890	Crown	1		1				1		3	109,837	31 00	8 78	4" on Fire Attachment.
15	Bornott, A. F.	S. E. 17th and Fairmount ave.	Apr. 28, 1890	Crown					1				1	2,019,630	71 00	161 57	
15	Brooke, Benj.	2314-16 Wood street	June 19, 1890	Crown			1						1	271,597	8 00	21 72	
15	Bergdoll Brg. Co.	29th and Parrish streets	June 8, 1890	Crown			2		1				3	1,863,405	145 00	149 07	
15	B. & O. R. R. Co.	2500 Callowhill street	Apr. 22, 1890	Crown				2					2	1,400,482	92 00	112 03	
15	Conrad, J.	27th and Poplar streets	June 24, 1890	Crown					2				2	10,377,752	236 12	830 21	
15	Fleisher, S. B. & B. W.	S. E. 25th and Biddle streets	Mar. 1, 1890.	Crown					1				1	1,948,200	108 00	155 85	
15	Fleisher, S. B. & B. W.	N. E. 25th and Hamilton sts.	Apr. 19, 1890	Crown							2		2	17,653,277	572 00	1568 11	One meter on Fire Attachment.
15	Lang, John	N. W. 24th and Vine streets	Apr. 11, 1890	Crown			1				1			207,915	7 00	16 63	4" meter on Fire Attachment.
15	McKeone, C. & Sons	2546-54 Callowhill street	Oct. 7, 1890	Crown			1						1	796,852	12 00	63 74	

NEW METERS SET.—*Continued.*

Wards.	Occupant.	Location.	Date when set.	Name of meter.	Size. 1½-inch.	¾-inch.	1-inch.	1½-inch	2-inch.	3-inch.	4-inch.	6-inch.	Total.	Quantity of water used. Gallons.	Charged by schedule rates.	Charged by meter rates.	Remarks.
15	Sellers, William & Co.	S. W. 16th and Hamilton	June 16, 1890	Crown			2						2	3,585,692	$185 00	$286 85	
15	Sellers, William & Co.	S. W. 16th and Hamilton	Dec. 8, 1890	Gem						1	1		2				
15	Stratton Ice Company	2610-12 Callowhill street	June 26, 1890	Crown					1				1	1,220,942	213 00	113 63	
16	Gill, M. A.	N. S. L'w'll'n av., W. of Glenal	May 28, 1890	Crown			1						1	1,072,680	125 00	84 81	
16	Nth. Liberties Gas W'ks.	S. W. Laurel and Canal street	Sept. 13, 1890	Gem					1				1	5,437,412	267 00	434 19	
16	Schmidt, C., Brg. Co	111-121 Edward street	June 5, 1890	Crown						1			1	8,105,300	No charge	648 43	
17	Burk & Bros.	1212-24 N. 3rd street	June 16, 1 90	Crown					1				1				
17	Burk & Bros.	1212-24 N. 3rd street	June 28, 1890	Crown					1				1	13,214,197	120 00	1,057 13	
17	Burk & Bros.	1212-24 N. 3rd street	Aug. 28, 1 90	Gem					1				1				
17	Reiger & Gretz	1538 Germantown avenue	Aug. 10, 1890	Crown						1			1	10,695,150	78 14	855 61	
17	Volmar, E.	1422 and 1424 Randolph street	April 5, 1890	Crown					1				1	8,193,140	16 00	655 41	
18	Bradlee & Co.	S. W. Beach and Otis streets	May 22, 1890	Crown		1							1	781,837	7 00	62 54	
18	Burgin & Sons	1204 & 1206 E. Montgomery av.	April 8, 1890	Crown					1				1	1,296,317	135 75	102 90	
18	Dougherty & Downs	1345 Frankford avenue	Oct. 3, 1890	Gem					1				1	15,302	208 00	1 71	
18	Hamilton, Thomas	1350 and 1352 Vienna street	May 2, 1890	Crown			1						1	1,040,175	98 00	83 21	
18	Kensingt'n E'g'n Wks	S. E. Beach and Vienna street	April 5, 1890	Crown				1					1	27,210	9 00	2 17	
18	Leibrandt & McDowell	S. E. Girard ave. and Ash st.	June 10, 1890	Crown		1	2						3	673,792	52 00	53 90	
18	Morse & Wil'iams	1101-05 Frankford avenue	April 9, 1890	Crown		2					1		3	143,985	26 00	15 79	4 in. meter on fire attachment.
18	Neafie & Levy	1365 Beach street	May 28, 1890	Crown		4	2						6	3,094,337	80 00	239 54	

NEW METERS SET.—*Continued.*

Wards.	Occupant.	Location.	Date when set.	Name of meter.	Size. ⅝ inch.	¾ inch.	1-inch.	1½-inch.	2-inch.	3-inch.	4-inch.	6-inch.	Total.	Quantity of water used. Gallons.	Charged by schedule rates.	Charged by meter rates.	Remarks.
18	Penn'a Sugar Refin'g Co	1033-39 North Delaware ave...	Oct. 11, 1890	Crown			1						1	8,032	$24 00	$0 64	4" meter on fire attachm'nt
18	Penn'a Sugar Refin'g Co	1033-39 North Delaware ave...	Oct. 11, 1890	Gem							1		1				
18	Torpin, Warner & White	943 Richmond street	May 23, 1890	Crown		1	1			1			3	93,985	10 00	7 43	
19	Feil, F.	2204-6 Fairhill street	Sept. 6, 1890	Crown				2					2	13,260,585	70 00	1,060 84	
19	Feil, F.	2205-07 North Sixth street	Sept. 8, 1890	Crown			1						1				
19	French, H	N.W. cor. Third & Cumberland	Oct. 4, 1890	Gem						2	1		3	41,107,140	434 00	3,288 57	
19	French, H	N.W. cor. Third & Cumberland	Oct. 4, 1890	Crown				1					1				
19	McNeeley & Co.	Fifth, Sixth & Randolph sts...	June 4, 1890	Crown		1				3			4	35,867,490	275 00	2,869 39	
19	Rickards, George	N.E.cor. Howard & Huntngd'n	May 28, 1890	Crown					1				1	2,062,066	79 00	164 96	
19	Reiger, J.	1708-14 Cadwalader street	Aug. 10, 1890	Crown						1			1	12,776,440	132 00	1,014 11	
19	Stinson, Bros.	N.W. cor. Reese & Huntingd'n	Sept. 4, 1890	Gem								1	1	No water used.			Fire attachm't
20	Kasper, Charles	1703 North Twelfth street	Aug. 13, 1890	Crown			1	1					2	690,547	111 80	55 24	
20	Necterlein & Kellerman	1744-48 Mervine street	Aug. 11, 1890	Crown					1				1	3,466,912	155 00	277 35	
20	Tenbrook & Bro.	1735-37 North Twelfth street...	Oct. 1, 1890	Crown		1							1	1,725,650	65 00	138 05	
20	Tenbrook & Bro.	1735-37 North Twelfth street...	Oct. 1, 1890	Gem					1				1				
21	Bond, R. DeS.	E.S. Main, N. of Washington st	Oct. 17, 1890	Gem							1		1	60,225	16 00	4 81	Fire attachm't
21	Campbell, A. M'fg Co.	W. S. Main st., on canal bank	Mar. 3, 1890	Crown					1	1			2	1,207,013	26 00	96 56	3" meter on fire attachmn't
21	Campbell, J. A.	River road	Sept. 17, 1890	Gem							1		1	171,900	No charge.	13 75	Fire attachm't
21	Carter & Lord	4428 Main street	Nov. 24, 1890	Gem							1		1	No water used.			Fire attachm't

NEW METERS SET.—*Continued.*

Wards.	Occupant.	Location.	Date when set.	Name of meter.	Size. ½-inch	¾-inch.	1-inch.	1½-inch.	2-inch.	3-inch.	4-inch.	6-inch.	Total.	Quantity of Water Used. Gallons.	Charged by schedule rates.	Charged by meter rates.	Remarks.
21	Carter & Lord	Rear 4440-42 Main street	Nov. 24, 1890	Gem	...	...	...	...	...	1	...	...	1	No water used.	...	...	Fire attachm't
21	Erdis & Roach	E. S. Main, N. of Washing'n st	Nov. 12, 1890	Gem	...	...	...	...	...	...	1	...	1	No water used.	...	...	Fire attachm't
21	McFadden & Co	River road, S. Washington st.	Nov. 3, 1890	Gem	...	...	...	...	...	...	1	...	1	136,875	$5 00	$10 95	Fire attachm't
21	Flanigan Bros.	N. E. Shurs lane & Freeland	Nov. 24, 1890	Gem	...	...	...	...	...	...	1	...	1	No water used.	...	...	Fire attachm't
21	Holt, Wm. & Son	N. E. High and Walnut sts	Nov. 14, 1890	Gem	...	...	...	...	...	...	1	...	1	2,517,772	...	201 42	4-in. meter on fire attachment
21	Holt, Wm. & Son	N. E. High and Walnut sts.	Nov. 14, 1890	Crown	2	...	...	1	1	...	...	...	4				
21	Holt, Wm. & Son	E. S. Main st., N. of Ridge av.	Nov. 28, 1890	Gem	...	...	...	...	...	...	1	...	1	57,562	163 00	4 60	4-in meter on fire attachment
21	Holt, Wm. & Son	E. S. Main st., N. of Ridge av.	Dec. 3, 1890	Crown	...	1	...	...	...	...	...	...	1				
21	Hutchinson & Ogden	E. S. Main st., N. of Ridge av.	Nov. 29, 1890	Gem	...	...	...	...	...	...	1	...	1	547,500	8 00	43 80	Fire attachm't
21	Hey, R. & Son	W. S. Main st., N. of Ridge av.	Nov. 7, 1890	Crown	...	1	...	...	...	...	...	...	1	1,039,412	11 00	82 35	4-in. meter on fire attachment
21	Hey, R. & Son	W. S. Main st., N. of Ridge av.	Nov. 7, 1890	Gem	...	...	...	...	...	...	1	...	1				
21	Keely, S. & Sons	Main and Washington	Dec. 2, 1890	Gem	...	...	...	...	...	...	1	...	1	129,777	8 00	10 22	4-in. meter on fire attachment
21	Keely, S. & Sons	Main and Washington	Dec. 2, 1890	Crown	1	...	...	...	...	...	...	...	1				
21	Kenworthy & Bro.	N. W. Shurs lane & Fricland	Mar. 10, 1890	Crown	...	...	...	...	...	1	...	...	1	20,675	8 00	1 73	Fire attachm't
21	Kenworthy & Bro.	E. S. Pechin, N. of Shurs lane	Mar. 22, 1890	Crown	...	...	...	...	...	...	1	...	1				
21	Leech, J. & Bro.	N. E. Shurs lane and Ashland	Nov. 11, 1890	Crown	1	...	...	...	...	...	...	...	1	85,125	8 00	6 81	4-in. meter on fire attachment
21	Leech, J. & Bro.	N. E Shurs lane and Ashland	Nov. 11, 1890	Gem	...	...	...	...	...	...	1	...	1				
21	Leibert & Obert	158-60 Oak street	Nov. 11, 1890	Crown	...	...	2	...	...	...	...	...	2	1,035,875	80 00	82 95	
21	Littlewood, G. J	E. S. Main st., N. of Ridge av.	Mar. 20, 1890	Crown	...	...	...	...	...	...	1	...	1	42,525	628 00	4 35	Fire attachm't

NEW METERS SET.—*Continued.*

Wards.	Occupant.	Location.	Date when set.	Name of meter.	Size. ⅝-inch.	¾-inch.	1-inch.	1½-inch.	2-inch.	3-inch.	4-inch.	6-inch.	Total.	Quantity of water used. Gallons.	Charged by schedule rates.	Charged by meter rates.	Remarks.
21	McDowell, F.	W. S. Main st., opp. Levering st	Oct. 14, 1890	Gem							1		1	No water used.			Fire attachm't
21	Manayunk Gas Co.	W. S. Main st., N. of Washingt'n	Dec. 3, 1890	Crown			1						1	7,040,917	$82 50	$563 27	
21	Nixon, M. & W. H. & Co	River road, N. of Fountain st.	Aug. 24, 1890	Gem						2			2	9,128,240	123 00	730 33	
21	Nixon, M. & W. H. & Co	River road, N. of Fountain st.	Aug. 24, 1890	Crown		1							1				
21	Nixon, M. & W. H. & Co	River road, N. of Fountain st.	Aug. 30, 1890	Crown	2	1	1						4				
21	Nixon, M. & W. H. & Co	River road, N. of Fountain st.	Aug. 30, 1890	Gem						1			1				
21	Platt Bros.	E. S. Main st., N. of Ridge ave	Nov. 21, 1890	Gem							1	1	2	347,887	12 00	27 83	3" & 4" meter on fire attachment.
21	Platt Bros.	E. S. Main st., N. of Ridge ave	Nov. 21, 1890	Crown	1								1				
21	Rice & Bean	N. E. cor. Cresson & Shur's lane	Mar. 10, 1890	Crown		2					1		3	581,050	128 00	48 08	4" meter on fire attachmn't
21	Schofield, S.	Rear 4236 Main street	Apr. 7, 1890	Crown							2		2	10,619,325	67 00	849 54	Fire attachm't
21	Schofield, S.	Main and Cotton streets	Apr. 29, 1890	Crown							1		1				
21	Schofield, S.	W. S. Main street	Apr. 29, 1890	Crown							1		1				
21	Stafford, A.	N. S. Church st., E. of Hamilton	Oct. 21, 1890	Gem							1		1	No water used.			Fire attachm't
21	Stafford, J.	S. S. Church st., E. of Hamilton	Nov. 18, 1890	Gem							1		1	1,426,567	8 00	114 12	4" meter on fire attachmn't
21	Stafford, J.	S. S. Church st., E. of Hamilton	Nov. 22, 1890	Crown			2						2				
21	Simister, C. R.	E. S. Main, N. of Washington st	Sept. 29, 1890	Gem							1		1	131,992	16 00	10 55	Fire attachm't
21	Simister, C. R.	E. S. Main, N. of Washington st	Sept. 29, 1890	Crown		1							1				
21	Simister, C. R.	4515-17 Main street	Dec. 5, 1890	Gem							1		1	33,665	71 00	3 01	Fire attachm't
21	Simister, C. R.	4515-17 Main street	Dec. 5, 1890	Crown			1						1				

NEW METERS SET.—(*Continued.*)

Wards.	Occupant	Location	Date when set.	Name of Meter.	Size. ⅝-inch.	¾-inch.	1-inch.	1½-inch.	2 inch.	3-inch	4-inch.	6-inch.	Total.	Quantity of water used. Gallons.	Charged by schedule Rates.	Charged by meter rates.	Remarks.
21	Stelwagen, J.	W.S. Main St., south of Bridge	Dec. 1, 1890	Crown	1								1	585,307	$8 00	$46 82	4" meter on fire attachm'nt
21	Stelwagen, J.	W.S. Main St., south of Bridge	Dec. 1, 1890	Gem							1		1				
21	Wallace, D.	N. W. Main and Shur's lane	April 7, 1890	Crown			1			1			2	No water used			
22	Germant'n Elec. Lt. Co.	N.S. Cumberland E. of Armat.	Feb. 28, 1890	Crown							1		1	2,584,600	No charge	206 68	
22	Germantown Ice Co	Heiskell street, N. of High	Oct. 28, 1890	Crown					1				1	4,183,875	No charge	335 71	
22	Leiling, L	Queen and Baird streets	Oct. 9, 1890	Gem					1				1	No water used			
22	Mills, W. & Son	34-44 Wister street	Oct. 25, 1890	Gem					1				1	7,410,870	368 00	592 86	
22	Miller, J. C.	Ashmead and Wakefield	Oct. 26, 1890	Crown	2	1				1			4	12,008,790	32 00	960 70	
23	Erdrich, A.	Bridge street above Harrison	Sept. 3, 1890	Gem							1		1	No water used			fire attachm'nt
23	Fritch, J.	4222-24 Edward street	Sept. 3, 1890	Crown		1				1			2	6,743,722	153 38	539 49	
23	Horricks, W.	N. S. Adams W. of Sellers st	Apr. 15, 1890	Crown					1				1	3,404,805	65 00	272 38	
23	Oldham, G.	Rear 4326 Lackawanna	May 27, 1890	Crown		1							1	22,537	No charge	1 80	
23	White Hall Dye Works	S. S. Frankford, E. of Stiles st	Apr. 15, 1890	Crown			1						1	407,147	83 00	32 49	
24	Beiswanger	N. W. 41st and Warren streets	Sept. 9, 1890	Crown			1						1	366,337	11 00	29 30	
24	Hestonville P. R. R. Co.	43d and Lancaster avenue	Aug. 6, 1890	Crown		1							1	1,268,595	57 00	101 48	
24	Mantua Market Co	36th and Haverford avenue	July 8, 1890	Crown	1								1	No water used			
24	McCann Estate	3901-13 Market street	Mar. 26, 1890	Crown		1	1	1					3	343,895	76 50	27 11	
25	Baeder, Adamson & Co.	N.E. Richmond & Allegheny	Sept. 10, 1890	Gem							1		1	No water used			fire attachm'nt
25	Bleachinger	2800-08 Jasper street	ay 21, 1890	Crown		2	2						4	3,004,462	46 00	240 35	

NEW METERS SET.—*Continued.*

Wards.	Occupant.	Location.	Date when set	Name of meter.	Size. ½-inch.	¾-inch.	1-inch.	1½-inch.	2-inch.	3-inch.	4-inch.	6-inch.	Total.	Quantity of water used. Gallons.	Charged by schedule rates.	Charged by meter rates.	Remarks.
25	Brehm & Stehle	E. S. Trenton ave. N. Clearfield	April 10, 1890	Crown				1					1	12,633,397	$131 00	$1,010 67	
25	Buck, J. V	2736 Church street	Oct. 3, 1890	Crown			1						1	85,995	30 00	6 86	
25	Children of Israel	2262 Wayne street	Oct. 29, 1890	Crown			1						1	11,010	29 00	88	
25	Goldschmidt, T. J	3344 Frankford avenue	June 5, 1890	Crown			1		1				2	1,512,097	6 00	120 96	
25	Moorehouse, R. O	2655 Bridge street	Sept 3, 1890	Crown	1								1	No water used.			
25	Schlichter, J	N. E. Erie ave. & Amber st	April 14, 1890	Crown			1						1	757,425	135 00	60 59	
25	Tate, W. J	3520 Lewis street	Aug. 29, 1890	Crown			1						1	3,615	8 00	29	
26	Bower, Henry	Twenty-ninth & Federal sts	Jan. 2, 1890	Crown			1						1	106,675	5 00	8 52	
26	Continental Brg. Co	S.W. 21st st & Washington av	Sept. 5, 1890	Gem							1		1	No water used.			Fire attachm't
26	Wall & Stewart	N. W. 24th and Ellsworth sts	May 3, 1890	Crown						1			1	1,314,007	149 00	105 12	
27	Allison M'fg Co	Thirty-second & Walnut sts	Feb. 12, 1890	Crown								1	1				Fire attachm't
27	Allison M'fg Co	Thirty-second & Walnut sts	Feb. 23, 1890	Crown							1		1				Fire attachm't
27	Allison M'fg Co	Thirty-second & Walnut sts	Mar. 15, 1890	Crown							2		2				Fire attachm't
27	Allison M'fg Co	Thirty-second & Walnul sts	April 30, 1890	Crown					1				1	26,981,950	962 00	1,838 55	Supply attch't
27	Allison M'fg Co	Thirty-second & Walnut sts	May 4, 1890	Crown							2		2				Supply attch't
27	Allison M'fg Co	Thirty-second & Walnut sts	May 11, 1890	Crown						1	1		2				Fire attachm't
27	Consumers' Ice Co	Thirtieth st. N. of Walnut st	Nov. 29, 1890	Crown			1						1	138,345	8 00	11 06	
27	Carey Bros	N. W. Tenth and Colona sts	May 19, 1890	Crown		1							1	No water used.			
27	Croft & Allen	S. E. 33d and Market sts	May 22, 1890	Crown			1						1	475,450	No charge.	87 47	

NEW METERS SET.—(*Continued.*)

Water.	Occupants.	Location.	Date when set.	Name of Meter.	Size. 1/2-inch.	3/4-inch.	1-inch.	1 1/2-inch.	2-inch.	3-inch.	4-inch.	6-inch.	Total.	Quantity of Water used. Gallons.	Charged by schedule rates.	Charged by meter rates.	Remarks.
28	Broad St. Omnibus Co...	Fifteenth st. N. of Huntingdon	Oct. 16, 1890	Gem					1				1	288,450	$5 00	$23 07	
28	Reiter, G.	2433 North Broad street	July 17, 1890	Crown			1						1	1,456,582	46 00	116 52	
28	Stengel, C.	2100-04 Germantown avenue	July 28, 1890	Crown			1	1					2	2,490 417	5 00	207 23	
29	Armholt and Schaeffer...	N. E. 31st. and Thompson st	June 15, 1890	Crown			1		1	1			3	25,578,480	417 00	2,046 27	
29	Barnhurst, J.	S. W. 21st. and Nicholas st	May 9, 1890	Crown		1							1	78,677	5 00	6 28	
29	Hines, H.	1307-09 N. Twenty-seventh st.	Feb. 22, 1890	Crown		1							1	117,656	No charge.	10 08	
29	Bergner & Engle Brg. Co.	N. E. 32d. and Thompson st	Feb. 21, 1890	Crown				1					1	556,042	101 00	44 48	
29	Baltz, J. and P. Brg. Co..	N. W. Thirty-first & Thompson	Jan. 24, 1890	Crown		1							1	842,962	46 00	67 43	
29	Flach, H. and Son	N. W. Thirty-first & Master sts.	Jan. 17, 1890	Crown						1			1	8,111,175	No charge.	648 89	Fire attachm't
29	Gourley, S	S. W. Twenty-first & Ridge ave	May 11, 1890	Crown		1							1	151,215	7 00	12 09	
29	Knickerbocker Ice Co ...	Col. ave. & Con. Railroad	May 9, 1890	Crown		1							1	451,432	19 00	36 11	
29	Maguire, D.	N. W. Ridge and College ave..	Oct. 23, 1890	Crown	2		1						3	2,155,220	25 00	173 21	
29	N. Broad St. Market Co..	W. S. Broad st. N. of Col. ave..	Dec. 18, 1890	Crown					1				1	6,124,170	52 00	489 93	
29	Ruhland, H.	S. W. 22d. and Stewart sts	Mar. 27, 1890	Crown		1	1						2	579,016	14 00	16 32	
29	Schlemmer	2705 Columbia avenue	Sept. 2, 1890	Gem					1				1	1,429,812	103 00	112 78	
29	Theiss, Chas. Esh.	N. W. 32d. & Thompson sts	Feb. 20, 1890	Crown							1		1	30,643,807	722 56	2,452 00	
29	Theiss, Chas. Esh.	N. W. 32d. & Thompson sts.	July 13, 1890	Crown						1			1				Fire attachm't
31	Peoples Theatre	Lettery st. & Kensington ave..	Sept. 26, 1890	Gem							1		1	No water used.			Fire attachm't
31	McStrarog, B.	N. W. Tulip and Huntingdon	Nov. 1, 1890	Crown		1							1	85,842	6 00	2 86	

NEW METERS SET.—*Continued.*

Wards.	Occupant.	Location.	Date when set.	Name of Meter.	Size. ½-inch.	¾-inch.	1-inch.	1½-inch.	2-inch.	3-inch.	4-inch.	6-inch.	Total	Quantity of water used. Gallons.	Charged by schedule rates.	Charged by meter rates	Remarks.
31	Weissbrod & Hess	Amber and Adams sts	Jan. 25, 1890	Crown		3			1				4	1,547,717	$50 00	$123 73	
33	Amhreim, L	3036 N. Sixth st	Apr. 24, 1890	Crown			1						1	328,590	38 00	26 28	
33	Carpenter, A. E	240 Somerset st	Apr. 26, 1890	Crown		1			1				2	474,442	107 00	37 95	
33	Philips, Townsend & Co.	Glenwood ave., e. N. P. R. R.	Dec. 16, 1890	Crown		1							1	17,930,688	121 00	1434 45	
33	Philips, Townsend & Co.	Glenwood ave., e. N. P. R. R.	Dec 16, 1890	Gem						1			1				
33	Webster	W. S. Kensington a., n. of I st.	Apr. 14, 1890	Crown			1						1	435,120	58 66	34 80	
34	Brook & Son	Fifty-fifth & Pennsgrove ave.	July 14, 1890	Crown			1						1	1,588,447	29 00	127 07	
		Totals			17	54	54	22	44	28	48	3	270	617,130,572	$14,328 39	$49,168 82	

MISCELLANEOUS WORK.

Months.	Examinations.					Miscellaneous.							Meters Tested.				Statements.
	Attachments.	Short supply.	Leaks.	Meters.	Total.	Boxes repaired.	Sidewalks repaired.	New Boxes put in.	Fish traps set.	New iron covers set.	Service pipes repaired.	Total.	Crown.	Gem.	Hersey.	Total.	
January	65	.....	3	25	93	.....	5	3	3	3	2	16	.....	.....	.....	.....	200
February	42	4	3	26	75	.....	.....	4	9	4	1	18	.....	.....	.....	.....	394
March	100	.....	1	37	138	.....	2	9	20	7	15	53	.....	.....	.....	.....	578
April	177	1	1	54	233	.....	.....	14	33	15	177	239	10	.....	.....	10	647
May	130	7	3	60	200	1	.....	19	26	19	20	85	9	.....	.....	9	861
June	234	3	4	57	298	3	.....	16	20	18	65	122	12	.....	.....	12	533
July	337	5	1	74	417	.....	.....	8	9	7	89	113	15	1	1	17	376
August	385	6	.....	81	472	2	.....	16	17	17	204	256	16	20	.....	36	160
September	108	1	.....	32	141	4	.....	15	4	15	125	163	10	21	.....	31	326
October	304	1	2	94	401	2	.....	13	6	13	146	180	15	30	.....	45	406
November	240	2	.....	72	314	2	.....	20	10	19	55	106	11	.....	.....	11	804
December	221	6	6	291	524	4	8	12	11	11	50	96	.....	.....	.....	.....	887
Totals	2,343	36	24	903	3,306	18	15	149	168	148	949	1,447	98	72	1	171	5,672

APPENDIX E.

REPORT

ON THE

Operations of the Construction and Repair Shop

DURING 1890.

TWELFTH AND REED STREETS,

Philadelphia, January 20, 1890.

JOHN L. OGDEN,

Chief of Bureau.

SIR:—I respectfully herewith submit the annual report of the operations of the Construction and Repair Shop for the year ending December 31, 1890.

Respectfully,

WILLIAM F. COURTNEY,

Superintendent of Shop.

MERCHANDISE.	DR.
To Stock on hand January 1, 1890	$13,881 03
Bolts and nuts	1,194 34
Hardware	473 78
Wrought-iron	1,720 21
Steel	194 53
Iron castings	20,980 06
Brass castings	6,489 38
Lumber	1,739 46
Paints, brushes, &c.	60 85
Oil and Tallow	102 73
Chandlery	173 25
Machinery	5,972 71

Wages		$28,726 42
Miscellaneous		192 70
Coal		1,251 80
Gum goods		3,935 60
Brass fittings		244 31
Lead coating		323 56
		$87,656 72

MERCHANDISE.			CR.
By First District, supplies and repairs			$10,016 87
Second " " " "			11,804 71
Third " " " "			12,664 29
Fourth " " " "			18,970 73
Fifth " " " "			2,108 93
Sixth " " " "			6,681 31
			$62,246 84

FAIRMOUNT PUMPING STATION.

By repairs to machinery	$325 32	
" to buildings and grounds	2 80	
		328 12

SPRING GARDEN PUMPING STATION.

By repairs to machinary	$2,171 72	
" to boilers	91 66	
" to buildings and grounds	93 54	
		2,356 92

BELMONT PUMPING STATION.

By repairs to machinery	$504 65	
" to boilers	261 79	
" to buildings and grounds	31 40	
		797 84

FRANKFORD PUMPING STATION.

By repairs to machinery	$329 05	
" to boilers	3 90	
" to buildings and grounds	13 26	
		346 21

ROXBOROUGH PUMPING STATION.

By repairs to machinery	$732 96	
" to boilers	273 58	
" to buildings and grounds	80 19	
		1,086 73

KENSINGTON PUMPING STATION.

By repairs to machinery	$2 63	
" to boilers	3 23	
		$5 86

CHESTNUT HILL PUMPING STATION.

By repairs to boilers	$1 72	
		1 72

MOUNT AIRY PUMPING STATION.

By repairs to machinery	$70 26	
" to boilers	6 78	
		77 04

GENERAL BUILDINGS AND GROUNDS	$293 42	
		293 42

CONSTRUCTION AND REPAIR SHOP.

Repairs and supplies	$1,484 17	
		1,484 17

MAIN OFFICE.

Repairs and supplies	$87 44	
		87 44

METERS.

Repairs and supplies	$1,142 33	
		1,142 33

FERRULES.

Labor, repairs and supplies	$36 35	
		36 35

OLD METALS.

Sales, repairs and supplies	$1,064 80	
		1,064 80

FIXED PATTERNS.

Repairs and supplies	$497 65	
		497 65

DISTRIBUTION	$595 25	
		595 25

MACHINERY.

Repairs and supplies	$1,525 03	
		1,525 03

Holmesburg Water Company	$44 75	
		$44 75
		$74,018 47
Cr		$74,018 47
Stock on hand, January 1, 1891		19,273 86
		$93,292 33
Dr		87,656 72
Balance to credit		$5,635 61

INVENTORY, JANUARY 1, 1891.

63	No. 1 fire hydrants, at $29 25	$1,842 75	
44	4-inch stop valves, at 13 00	572 00	
28	8-inch " " " 24 00	672 00	
20	10-inch " " " 31 00	620 00	
35	13-inch " " " 37 00	1,295 00	
4	16-inch " " " 60 00	240 00	
5	20-inch " " " 95 00	475 00	
10	Barton stop bonnet and screws, at $8 00	80 00	
2	36-inch rotary valves, labor, $350 00		
	iron, 176 12	1,052 24	
2	48-inch " " labor, 425 00		
	iron, 244 45	1,338 90	
			$8,187 89
2	10-inch O. S. stop screws, at $ 4 50	$ 9 00	
2	12-inch " " " " 5 00	10 00	
24	16-inch " " " " 6 50	156 00	
15	20-inch " " " " 8 25	123 75	
2	30-inch " " " " 10 25	20 50	
3	36-inch " " " " 12 00	36 00	
			355 25
89	6-inch N. S. stop screws, at 2 50	$222 50	
6	8-inch " " " " 3 25	19 50	
14	10-inch " " " " 4 50	63 00	
14	12-inch " " " " 5 00	70 00	
6	16-inch " " " " 6 50	39 00	
5	20-inch " " " " 8 25	41 25	
2	30-inch " " " " 10 25	20 50	
1	36-inch " " " " 12 00	12 00	
2	48-inch " " " " 15 00	30 00	
			517 75

24	Viney stop screws, at $2 00	$48 00	
6	Berkenbine stop screws, at $2 50	15 00	
3	Chapman stop screws, at $2 00	6 00	
4	10-inch Barton stop screws, at $5 00	20 00	
60	4-inch socket screws, at $1 50	90 00	
105	6-inch " " " 1 75	183 75	
18	8-inch " " " 2 00	36 00	
27	10-inch " " " 2 25	60 75	
25	12-inch " " " 2 50	62 00	
			$522 00
21	4-inch spindles, at $1 50	$31 50	
48	6-inch " " 1 75	84 00	
24	8-inch " " 2 00	48 00	
24	10-inch " " 2 25	54 00	
27	12-inch " " 2 50	67 50	
6	spindles for drilling machine, at $3 50	21 00	
3	posts, at $3 50, and nuts, at $3 50	21 00	
			327 00
12	4-inch iron bands, at $2 25	$9 00	
27	6-inch " " " 4 00	108 00	
27	8-inch " " " 5 00	135 00	
4	10-inch " " " 6 00	24 00	
18	12-inch " " " 7 00	126 00	
16	16-inch " " " 7 50	120 00	
2	20-inch " " " 9 50	19 00	
8	36-inch " " " 17 00	136 00	
			677 00
1	24-inch furnace, at $17 00	$17 00	
6	furnace grates, at $5 00	30 00	
24	pairs cast-iron monkey legs, at $1 50	36 00	
27	pairs w. i. monkey legs, at $3 25	87 75	
41	cross heads and nuts, at $1 50	61 50	
197	cast iron plugs at $1 00	197 00	
410	wooden plugs at 50 cents	205 00	
200	brass plugs at 50 cents	100 00	
17	iron plug risers, at $2 50	42 50	
			776 75
49	wooden stop boxes, at $2 50	122 50	
12	wooden box risers, at 35 cents	4 20	
2	hydrant keys, at $2 25	$4 50	
2	street (stop) keys, at $5 25	10 50	
22	chisels, hand diamond points, at 35 cents	7 70	
20	chisels hand gouges, at 50 cents	10 00	
12	chisels, handled gouges, at 60 cents	7 20	
1	chisel, handled diamond points, at 90 cents	90	
9	pipe cutters, at 60 cents	5 40	

2	flat chisels, at 35 cents	$ 70	
25	drills, at 50 cents	12 50	
7	drill sockets, at 50 cents	3 50	
9	taper reamers, at $3 50	31 50	
8	sets handled caulking tools, at 4 50	36 00	
2	sets hand caulking tools, at $2 50	5 00	
			$135 40
32	drill press mandrils, at 75 cents	$24 00	
8	gasket irons, at 60 cents	4 80	
16	dozen S. hooks, at 75 cents	12 00	
25	dozen plug monkey keys, at 25 cents per dozen	6 25	
4	stop spindle keys, at 75 cents	3 00	
21	dozen clevises, at 75 cents per dozen	15 75	
5	large lead pots, at $4 00	20 00	
9	medium lead pots, at $2 50	22 50	
14	small lead pots, at $1 35	18 90	
14	tail clamps, at 75 cents	10 50	
45	eye bolts, at 75 cents per dozen	2 81	
8	pressure caps, at $1 75	14 00	
3	reducing caps, iron, at $1 00	3 00	
2	cap nut wrenches, at $1 25	2 50	
4	pressure cap wrenches, at $1 25	5 00	
2	D. E. plug wrenches, brass, at $1 75	3 50	
18	stub end straps, at $9 50	171 00	
3	stub end straps, at $10 50	31 50	
40	flushing nozzles at $1 70	68 00	
10	plug monkeys, at $4 50	45 00	
7	crown heads, at $4 50	31 50	
60	iron hoe heads, at $1 50	90 00	
35	O. S. plug nuts, at 25 cents	8 75	
30	N. S. plug nuts, at 25 cents	7 50	
135	brass frost valves, at 40 cents	54 00	
10	street (stop) keys, at 75 cents	7 50	
			$683 26
	Finished parts of stock cocks	$158 81	
	Finished parts of fire hydrants	97 60	
6	Unfinished 20-inch rotary valves,		
	Labor, machinists	$427 17	
	Iron	763 36	
	Making patterns	379 80	
		$1,570 33	
			$1,826 74
3,395	lbs. white (non-shrinking) metal, at 24 cents	$814 80	
20	lbs. copper wire, at 20 cents	4 00	
325	lbs. rolled brass, at 22c	71 50	
30	lbs. brass wire, at 17½ cents	5 25	

4,330 lbs. unfinished brass castings, at 13 cents	$562 90		
1,835 lbs. finished brass castings, at 20 cents	367 00		
23,618 lbs. wrought-iron, at 3 cents	708 54		
3,020 lbs. cast steel, at 15 cents	453 00		
3,924 lbs. machinery steel, at 3 cents	117 72		
161 lbs. spring steel, at 3½ cents	5 63		
346 lbs. shear steel, at 8 cents	27 68		
1,550 lbs. iron forgings, at 10 cents	155 00		
25,336 lbs. iron castings, at 2 1/10 cents	532 06		
22,671 lbs. iron castings, at 2½ cents	566 77		
4 pinions and spindles for O. S. 36-inch stop, at $6.00	24 00		
3 gear wheels, at $2.75	5 50		
Hardware	118 17		
Bolts and nuts	373 86		
Oil and tallow	40 70		
Chandlery	41 03		
		$4,995	11
Lumber	120 74		
Paints, oils, brushes, etc	22 27		
		143	01
		$19,273	86

ARTICLES MANUFACTURED DURING 1890.

269 No. 1 fire hydrants, at $29 25	$7,868 25		
490 No. 2 fire hydrants, at $37 00	18,130 00		
		$25,998	25
51 4-inch stop cocks, at $13 00	$663 00		
761 6-inch stop cocks, at 15 00	11,415 00		
27 8-inch stop cocks, at 24 00	648 00		
48 10-inch stop cocks, at 31 00	1,488 00		
35 12-inch stop cocks, at 37 00	1,295 00		
6 16-inch stop cocks, at 60 00	360 00		
5 20-inch stop cocks, at 95 00	475 00		
1 30-inch stop cock, at 190 00, O. S. special	190 00		
2 30-inch stop cocks, at 383 56, rotary	767 12		
11 36-inch stop cocks, at 525 00	5,775 00		
6 48-inch stop cocks, at 665 00	3,990 00		
		$27,066	12
7 4-inch stop screws, at $ 2 25	$15 75		
29 6-inch " " " 2 50	72 50		
3 8-inch " " " 3 25	9 75		
21 10-inch " " " 4 50	94 50		
15 12-inch " " " 5 00	75 00		

9	20-inch stop screws, at 6 50	$58 50	
5	30-inch " " " 10 25	51 25	
2	48-inch " " " 14 80	29 60	
			$406 85
85	4-inch socket screws, at $1 50	$127 50	
141	6-inch " " " 1 75	246 75	
3	8-inch " " " 2 00	6 00	
4	Barton stop screws, at 3 25	13 00	
24	Viney " " " 2 00	48 00	
3	Chapman " " " 2 25	6 75	
6	Berkenbine stop screws, at 2 50	15 00	
			463 00
42	4-inch iron bands, at $ 2 00	$ 84 00	
299	6-inch " " " 2 15	642 85	
27	8-inch " " " 3 50	94 50	
3	10-inch " " " 5 00	15 00	
8	36-inch " " " 17 00	136 00	
24	48-inch " " " 20 00	480 00	
			1,452 35
41	pairs c. i. monkey legs, at $1 50	$ 61 50	
48	pairs w. i. monkey legs, at 3 25	156 00	
115	cross heads and nuts, at 2 25	258 75	
1198	wooden plugs, at 50 cents	599 00	
867	brass plugs, at 50 cents	433 50	
194	iron plugs, at 50 cents	97 00	
800	frames and covers, 166, 576 lbs., at $1 65	2,748 50	
6	20-inch iron furnace grates, at $4 00	24 00	
			4,378 25
143	flat chisels, at 35 cents	$50 05	
64	hand gouges, at 50 cents	32 00	
12	handled gouges, at 60 cents	7 20	
115	hand diamond points, at 35 cents	40 25	
66	handled diamond points, at 90 cents	59 40	
			188 90
38	pipe cutters, at 60 cents	$22 80	
3	medium lead pots, at $2 50	7 50	
6	reducing caps, at $1 00	6 00	
12	pressure caps, at $1 75	21 00	
62	dozen S. hooks, at 75 cents	46 50	
27	dozen clevises, at 75 cents	20 25	
21	mandrils, at $1 25	26 25	
			150 30

2	street (stop) keys, at $5 25	$10 50	
1	hydrant key, at $2 25	2 25	
13	dozen plug monkey keys, at 25 cents	3 25	
1,519	wooden stop boxes, at $2 50	3,797 50	
544	wooden stop box risers, at 35 cents	190 40	
8	hammers, at $1 00	8 00	
175	eye bolts, at 40 cents	77 00	
87	tail clamps, at 75 cents	65 25	
4	reamers, at $3 50	14 00	
17	plug wrenches, at 50 cents	8 50	
144	wedges, at 35 cents	50 40	
5	iron plug risers, at $2 00	10 00	
33	gasket irons, at 60 cents	19 80	
16	sets caulking tools, at $2 50	40 00	
16	sets caulking tools, at $4 50	72 00	
10	stub end straps, at $9 50	95 00	
3	stub end straps, at $10 50	31 50	
			$4,495 35
			$64,599 37

Stop Cocks, Frames and Covers, Fire Hydrants, etc., delivered from Department Construction and Repair Shop to Purveyors' Districts, Works, etc., during the year 1890.

Districts.	Stop Cocks.											Stop Screws.						Stop.	
	4-inch.	6-inch.	8-in h.	10-inch.	12-inch.	16-inch.	20-inch.	30-inch Flange.	30-inch Rotary.	36-inch Rotary	48-inch Rotary.	6-inch.	8-inch.	10-inch.	12-inch.	16-inch.	20-inch.	30-inch.	Boxes.	Risers.
First	9	174	8	5	5	1	...	.....	.....	.....	.....	13	...	4	...	...	...	...	336	81
Second	2	146	2	5	5	1	...	.....	.....	.....	.....	.....	3	6	4	...	...	...	312	55
Third	4	164	.....	4	.....	...	...	.....	.....	3	.....	.....	...	.....	...	...	...	...	391	207
Fourth	7	125	1	14	.....	...	...	.....	.....	2	4	10	...	.....	...	...	...	4	218	84
Fifth	7	42	.....	4	5	...	...	.....	.....	.....	.....	.....	...	.....	...	...	1	...	81	
Sixth	.....	110	.....	12	3	2	...	.....	.....	.....	.....	.....	...	.....	...	...	...	...	249	20
Works	2	.....	.....	.....	.....	...	...	1	2	4										
Total	31	761	11	44	18	4	...	1	2	9	4	23	3	10	4	...	1	4	1,587	447

Stop Cocks, Frames, etc.—*Continued.*

Districts.	Iron Bands.								Socket Screws.					Stop.					
	4-inch.	6-inch.	8-inch.	10-inch.	12-inch.	20-inch.	30-inch.	36-inch.	48-inch.	4-inch.	6-inch.	8-inch.	10-inch.	12-inch.	Cast Iron M'k'y Legs.	W'i Iron M'k'y Legs.	Cross Heads.	Nuts.	Spindles.	Barton Bonnet and Screw.
First	.....	21	...	1	...	...	.....	...	.....	.....	.....	...	.....	...	3	5	.....	1		
Second	.....	36	...	...	...	...	.....	...	.....	12	36	...	6	...	30	24	48	24	36	
Third	24	132	...	...	4	1	.....	...	.....	.....	.....	...	6	...	.....	.....	25	12	6	
Fourth	1	53	...	...	...	...	30	...	24	66	36	...	12	...	30	23	29	30	36	3
Fifth	.....	18	...	3																
Sixth	12	48																		
Works																				
Total	37	308	...	4	4	1	30	...	24	78	72	...	24	...	63	52	102	67	78	3

Articles delivered to the Purveyors' Districts, Works, etc. *Continued—1890.*

Districts:	Fire Hydrants.		Keys.			Chisels.					Plugs.										
	No. 1.	No. 2.	Stop.	Hydrant.	Plug Monkey.	Flat.	Hand Dia Points.	Handle Dia Points.	Pipe Cutters.	Caps.	Wood.	Iron.	Brass.	Frames.	Covers.	Reducing Caps.	Pressure Caps.	Lead Pots.	Hand Gouges.	Handle Gouges.
First	64	71	37	.....	27	60	36	...	6	...	170	12	60	.....	30	2	3			
Second	49	135	72	.....	252	72	24	...	...	...	138	24	206	75	75	2	2	3		
Third	46	130	1	.....	.....	.....	...	...	...	...	288	30	522	150	150	...	1			
Fourth	33	149	.....	.....	48	12	6	6	24	...	267	.....	133	6	6	1	...	...	60	12
Fifth	2	15	1	.....	.....	.....	...	12	...	...	38	.....	24							
Sixth	44	46	.....	.....	.....	.....	...	...	12	...	180	.....	60							
Works	.....	.....	.....	.....	1	30	12	...	...	9	.....	.....	.....	118	94	2	1	...	6	1
Total	238	546	111	.....	328	174	78	78	42	9	1,081	66	1,005	349	355	7	7	3	66	13

List of Articles Delivered—*Continued.*

Districts:	S. Hooks.	Clevises.	Hook Bolts.	Stub End Straps.	Mandrels.	Hammers.	Eye Bolts.	Tail Clamps.	Reamers.	Wrenches.	Wedges.	Cross Bats.	Plug Risers.	Iron Furnaces.	Plug Monkeys.	Gasket Irons.	Caulking Tools.	Glands.	Fire Hydrant Reducers.	Set Screws for Drill Machine.	Gum Joint Rings.
First	204	108	7	...	...	2	.....	.....	2	9	12	...	...	...	...	Sets 2	Sets 2	.....	.....	.....	48
Second	396	216	...	...	...	...	.....	12	...	7	.....	...	...	...	...	12	.....	12	.....	.....	.....
Third	.....	.....	...	...	1	...	.....	.....	2	...	.....	...	...	...	...	.....	.....	.....	1	12	30
Fourth	24	36	3	...	...	...	72	24	...	7	12	...	...	1	...	6	23	.....	.....	12	.....
Fifth	.....	.....	...	...	...	...	31	15	...	...	.....	...	...	G	...	.....	.....	.....	.....	.....	27
Sixth	72	6	...	...	...	6	72	36	...	...	120	...	...	6	...	12	6	.....	.....	.....	.....
Works	.....	.....	...	2	...	...	.....	.....	...	1	.....	...	...	...	...	1	1	.....	.....	.....	.....
Total	696	366	10	2	1	8	175	87	4	24	144	...	...	7	...	33	32	12	1	24	105

APPENDIX F.

REPORT OF JOHN E. CODMAN,

In Charge of Hydrographic Work.

BUREAU OF WATER,

Philadelphia, January 16, 1891.

JOHN L. OGDEN,
Chief, Bureau of Water.

SIR:—The following report of hydrographic work and data collected during the year 1890, in connection with the investigation of the sources for a future water supply, is respectfully submitted.

During the year rain-fall and stream flow observations have been continued at all the stations maintained by the Bureau, completing eight years continuous records.

The value of records of this character depends entirely on the length of time, completeness, and accuracy of the observations; also upon a systematic method of taking, properly recording and tabulating in a form suitable for future reference the obtained data.

The distribution of the rain-fall throughout the year 1890 was, with the exception of the month of November, remarkably regular and constant. The average for each month for the water-shed of the Perkiomen was 4.68 inches; of the Neshaminy, 4.41 inches; and of the Tohickon, 4.75 inches.

The greatest rain-fall, on the surface drained by the three streams for any month during the year occurred in March, with an average of 6.23 inches.

The least rain-fall for any month occurred during the month of November, with an average of 1.08 inches. The total rain-fall for the year 1890 for the eastern counties of Pennsylvania was two per cent. above the average of the past eight years of observation, and nineteen per cent. or 11.47 inches below that of 1889. During the year no very heavy or long continued rain-storm occurred at any of the stations.

The automatic gauge at Thirty-second and Spruce streets recorded but thirteen storms in which the rate reached 0.25 inch per hour or more; the automatic gauge at the forks of the Neshaminy recorded but nineteen storms in which the rate exceeded 0.25 inch per hour or more, and the automatic gauge at Frederick (or Spring Mount Station, P. R. R.) recorded but twenty-four storms in which the rate reached 0.25 inch or more.

The greatest amount recorded in any one storm, by the Philadelphia gauge, was during the storm of March 22 and 23, when 0.32 inch fell in eight minutes, or at the rate of 2.40 inches per hour. The greatest amount recorded by the automatic gauge at the forks of the Neshaminy was during a shower on June 6 when 0.90 inch fell in twenty-eight minutes, or at the rate of 1.92 inches per hour.

The greatest amount recorded by the automatic gauge at Frederick was during the rain-storm of July 2 and 3, when 0.96 inch fell in thirty-six minutes, or at the rate of 1.60 inches per hour. The snow which fell during the winter months up to the 26th of December melted as soon as it fell and did not amount to more than six inches. The snow of December 26 was about five inches deep, and was followed by a temperature sufficiently low for the snow to remain on the ground until the end of the year.

The total amount of rain-fall registered by the automatic gauge at Thirty-second and Spruce streets, Philadelphia, for the year 1890 was 34.68 inches, or 15.98 inches less than that recorded for 1889.

The total amount recorded by the United States Signal

Service Station at Ninth and Chestnut streets, for the year, was 34.02 inches, or 16.58 inches less than for 1889.

During the year observations on the different sizes of rain gauges, together with the observations on the difference in elevation have been continued at Thirty-second and Spruce streets, Philadelphia, with the following results:

Diameter of Collector, 22⅝ inches, 17 feet above the ground, 34.67
Diameter of Collector, 7¼ inches, 17 feet above the ground, 34.25
Diameter of Collector, 2 inches, 17 feet above the ground, 34.67

In March an eight-inch collector, with the edge twenty inches above the surface of the ground, was placed in position and yielded for ten months 33.49 inches.

The average of the other collectors seventeen feet above the ground, for the same period of time, was 29.71 inches, or about thirteen per cent. less.

The automatic gauges at the forks of the Neshaminy and Spring Mount on the Perkiomen Railroad are 11 feet above the surface of the ground. The total amount collected from these gauges was 95 per cent. of the amount collected from the gauges on the ground.

The amount of rain collected in gauges at different elevations above the surface of the ground is approximately shown in the few records made by the Bureau. In order to further investigate this part of the work the suggestion is made that a series of gauges at different elevations above the surface be placed at the station at Thirty-second and Spruce streets.

This station, from its situation, exposure, and freedom from trees or high surrounding objects, is a favorable location for experiments of this kind. The observations should be continued for a period of time sufficient to get satisfactory results. Such observations have been made in other countries, but it is an open question whether results obtained from these observations would apply to our climate and different atmospheric conditions.

If the amount of rain collected at 20 inches above the surface of the ground be computed at 100, the amount at 11 feet

above the surface would be 95; at 17 feet, 88 and at the Signal Service, 165 feet, 87.

The amount of rain recorded at stations outside of the City of Philadelphia was from 21 to 66 per cent. greater than was collected by the Bureau of Signal Service gauges. The Pennsylvania Hospital records 21 per cent. more than the Signal Service, and 18 per cent. more than the Bureau gauges. The greatest amount collected at any of the Bureau stations outside of the City was $56\frac{46}{100}$ inches at Quakertown. The precipitation in this City exceeded 0.01 of an inch on 135 days.

Mr. Thomas I. Beans, volunteer observer at Moorestown, N. J., furnished a daily record in which he says: "Length of record 27 years. The rain-fall for November 1890—0.98 inch—was the lightest for the month of November during the period of record. The average yearly rain-fall for 26 previous years was 44.006 inches, making that of 1890, 0.701 inch below the average. The greatest yearly rain-fall during the above period occurred in 1889, and was 53.655 inches. The least yearly rain-fall occurred in 1879 and was 36.035 inches."

The rain-fall records are complete for the year 1890, both those made by volunteer observers and by those maintained by the Bureau.

Mr. E. F. Smith, Superintendent of Canals, at Reading, has furnished monthly reports of the rain-fall at Reading, Browers, and Hamburg, all in the Schuylkill Valley. The rain-fall at Reading was $11\frac{49}{100}$ inches less than the amount collected in 1889; at Browers, 20 inches less. This decrease in the rain-fall as compared with 1889, extending over nearly all the Valley of the Schuylkill, is shown very plainly in the decreased flow of the Schuylkill river.

The records kept at Fairmount Station of the amount of water flowing over Fairmount dam during 1890 showed a total of 88 feet 5 inches; the amount for 1889 was 195 feet 10 inches; in other words, 107 feet 5 inches more water passed over the dam in 1889 than in 1890. The average

rain-fall in the Valley of the Schuylkill was 48.93 inches. The average daily flow was 1,670,538,070 gallons or 41 per cent. of the rain-fall computed from the records kept at Fairmount.

The records so far show that the year 1889 from January 1 to January 1 was a maximum in rain-fall throughout the Schuylkill Valley and the river for that year reached a maximum flow. The total depth of water flowing over the dam was far in excess of any previous year.

In making up the tables of flow of the several streams upon which observations are carried out, the year is computed from October 1 to October 1. This method of comparison gives different results from those above referred to on the Schuylkill extending from January to January.

Table I shows the monthly and total precipitation as compared with the United States Signal Service report, and the average amounts for eight years of observation.

Tables II, III, IV and V are a continuation of the tables begun in 1889, and it is hoped that they will prove of value in the future.

Table VI is a new one, showing the yearly percentage of rain discharged by different streams, compiled from the data of previous years and arranged in tabular form. An inspection of this table shows that the year of greatest rain-fall is the year of greatest discharge, but the greatest percentage of discharge does not follow the greatest rain-fall; further, the year of least rain-fall is also the year of least discharge, but the least percentage of discharge does not follow the least rain-fall.

A new diagram has been made showing the flow each month in percentage of rain-fall. An inspection of this diagram presents some peculiar points not seen so clearly when only the figures are given.

The average daily flow of the Perkiomen for the past seven years was 191,159,160 gallons, the year ending September 30. The yield of the same stream for 1890 was 237,470,607 gallons, or 24 per cent. above the average of the past seven years.

The rain-fall on the water-shed was 17 per cent. above the average. The yield of the Perkiomen from September 30, 1889 to October 1, 1890 was over fourteen millions of gallons per day more than the yield for the year ending September 30, 1889. This may be partly accounted for by the heavy rains extending over the upper valley of the Perkiomen during the months of February, March, April and May, 1890; a much larger quantity being found in the Perkiomen for those months than in either of the other streams.

The average daily yield of the Neshaminy for the past seven years was 163,726,962 gallons. The daily yield of the same stream for the year 1890 was 173,498,450 gallons, being 6 per cent. above the average of the past seven years, with a rain-fall of 5 per cent. above the average on the water-shed. The yield of the Neshaminy was more than thirty-four millions of gallons per day less than for the year 1889.

The average daily yield of Tohickon Creek for the past seven years was 155,346,024 gallons. The yield of the same stream for the year 1890 was 162,921,606 gallons or 5 per cent. above the average of the past seven years, with a rain-fall of 8 per cent. above the average. The daily yield of the Tohickon was over twenty-one million gallons less than the yield of 1889.

Table XI shows the amount and daily yield of different streams from January 1 to January 1.

Table XII shows the amount and daily yield of the same streams from October 1 to October 1.

New field rain gauges, made from a design prepared in the Bureau, were placed at all the stations early in March, 1890. These gauges are made of brass and are much stronger and heavier than the old tin ones.

The automatic rain gauges are all in good condition and give satisfactory results.

The automatic steam gauge at Spring Mount was formerly fastened to a tree; this showed signs of weakness during the winter and in June the gauge was raised about 15 inches. New

14 inch by 14 inch yellow pine posts were firmly set in the bank, bolted and braced in as strong a manner as possible, to prevent it being carried away by the ice. Owing to high water and other causes the Tohickon weir was not put in operation.

The following named persons have been engaged as observers and rodmen during the entire year:

John G. Hilsman, rodman, Rush Valley P. O.
George W. Wood, rodman, Spring Mount, Penna.
R. G. Stover, rodman, Point Pleasant, Penna.
Dr. George M. Grim, gauge observer, Ottsville.
George Lowder, gauge observer, Smith Corner.
Dr. J. A. Roth, gauge observer, Seisholtzville.
A. W. Walton, gauge observer, Doylestown.
H. L. Shull, gauge observer, Lansdale.

The Bureau is indebted to the following persons who have kindly furnished rain-fall records:

Mr. Thomas Meehan, Germantown, Philadelphia.
Mr. Thomas MacKellar, Germantown, Philadelphia.
Mr. J. L. Heacock, Quakertown, Penna.
Sergeant L. M. Dey, U. S. Signal Service.
Sergeant T. F. Townsend, State Weather Service, Philada.
Mr. Benjamin Shoemaker, Pennsylvania Hospital, Philada.
Mr. E. F. Smith, Chief Engineer of Canals, Reading, Pa.
Mr. Thomas J. Beans, Moorestown, N. J.
Dr. Charles Moore, Pottstown, Penna.
Professor J. W. Moore, Lafayette College, Easton, Penna.
Professor Seldon, Lafayette College, Easton, Penna.

During 1890 all observations on rainfall were taken uniformly in accordance with the instructions given at the beginning of the year.

Respectfully,

JOHN E. CODMAN,
In Charge of Hydrographic Work.

TABLE 5.

Rain Storms Exceeding in Rate 0.25 Inch Per Hour as Recorded by the Automatic Rain Gauge at Philadelphia, Pa., for the Year 1890.

Date of Observations.	Total Fall.		Maximum Fall.		
	Amount in inches.	Duration. Hrs. Min.	Amount in inches.	Duration in min'ts.	Rate per hour during max. fall.
January 15th, N. E. storm	0.35	4—40	0.10	8	0.75
February 7th and 8th	1.09	23—40	0.25	60	0.25
March 22d and 23d, rain storm	1.12	26—45	0.32	8	2.40
March 22d and 23d, rain storm			0.15	10	0.90
March 28th, thunder storm	0.60	19—10	0.20	28	0.43
May 20th	0.57	7—05	0.22	16	0.83
June 6th, shower	.040	0—40	0.40	20	1.20
July 3d, rain storm	0.64	3—00	0.55	80	0.41
July 17th, shower	0.75	3—15	0.50	25	1.20
August 19th, shower	0.43	1—08	0.43	68	0.40
August 22d, shower	1.27	1—10	1.12	45	1.49
October 6th, rain storm	0.91	7—30	0.45	80	0.34
October 17th, rain storm	0.62		0.15	12	0.75

ΓEDS,

JA

:VA'

	NESHAMINY SERIES.							
IAMBU	NT PLEASANT.		LANSDALE.		FORKS OF NESHAMINY.		DOYLESTOWN.	
365.1	119.5		350		143		405	
	Inches.	Difference, Inches.	Precipitation, Inches.	Difference, Inches.	Precipitation, Inches.	Difference, Inches.	Precipitation, Inches.	Difference, Inches.
03	.45	—0.62	2.29	—0.46	2.40	—0.57	1.55	—0.28
93	.73	—1.34	4.28	—0.89	4.27	—0.88	4.29	—0.90
98	.38	—1.77	5.33	—0.72	5.66	—1.05	5.09	—0.48
79	.84	—0.44	2.12	—0.16	2.74	—0.46	2.51	0.23
67	.57	—2.61	5.18	—2.22	5.00	—2.04	5.41	—2.45
02	.58	—2.28	2.19	—0.89	5.74	—4.44	5.59	—4.29
19	.39	—1.36	4.30	0.27	4.42	0.39	4.65	0.62
51	.01	—2.65	4.58	1.22	5.90	2.54	5.41	—2.05
94	.45	—0.14	2.67	0.36	3.04	0.73	3.28	0.97
26	.76	—0.94	6.52	—1.70	5.77	0.95	6.26	1.44
87	.95	—0.15	1.17	—0.37	0.95	—0.15	1.09	0.29
21	.20	—0.87	2.37	0.04	2.51	—0.18	3.38	—1.05
.40	31	14.29	43.00	—8.98	48.40	—14.38	48.51	—14.49
51	.42	.....	124	.....	142	.....	142	.....
87	.33	.....	47.94	.....	50.10	.....	50.36	.....
09	.38	.....	120	.....	125	.....	126	.....

e Year 1890, and the effects on the Perkiomen,

C STREAM GAUGE.				
of int. in.	Number of hours of storm flow. Hrs. Min.	Stream flow in cubic feet per second at highest point.	Average yield in cubic feet per second per square mile of drainage area for hours of storm flow.	REMARKS.
	48—00	4,272	8.500	
	48—00	8,340	15.626	
	36—00	3,415	11.630	
	96—00	6,760	13.382	
	48—00	2,925	7.841	
	24—00	1,945	7.131	
	72—00	5,220	9.955	
	[32—00	864	4.368	
	28—00	1,360	8.554	
				No effect on stream.
				No effect on stream.
	24—00	1,163	5.286	
	24—00	999	4.600	
				No effect on stream.
	24—00	1,410	5.236	
	48—00	1,625	5.651	
	24—00	2,156	6.237	
	60—00	2,788	10.729	

TABLE 6.

Table Showing Proportion of Rainfall Discharged by each Stream from October to October.

Years. October to October.	Rainfall.			Discharge in Inches of Rainfall.			Percentage of Rainfall Discharged.		
	Perkiomen.	Neshaminy.	Tohickon.	Perkiomen.	Neshaminy.	Tohickon.	Perkiomen.	Neshaminy.	Tohickon.
1883–1884	48.00	48.84	50.08	32.06	28.32	35.06	66	58	70
1884–1885	38.12	38.28	41.21	18.68	17.61	22.25	49	46	54
1885–1886	47.78	50.24	50.40	25.32	25.12	32.76	53	50	65
1886–1887	50.16	51.89	51.90	21.57	21.27	25.43	43	41	49
1887–1888	50.31	48.77	53.15	26.34	25.43	35.36	52	52	66
1888–1889	60.20	60.54	64.66	30.70	31.48	37.50	51	52	58
1889–1890	56.19	52.95	56.99	32.58	25.95	32.49	58	49	57

	Greatest Rainfall.			Greatest Discharge.			Greatest Percentage Discharged.		
Year	1889	1889	1889	1890	1889	1889	1890	1886	1888
Amount	60.20	60.54	64.44	32.58	31.48	37.50	58	52	66

	Least Rainfall.			Least Discharge.			Least Percentage Discharged.		
Year	1885	1885	1885	1885	1885	1885	1887	1887	1887
Amount	38.12	38.28	41.21	18.68	17.61	22.25	43	41	49

TABLE 7.

Comparative Statistics of Sundry Watersheds—1890.

Watersheds.	Area in square miles.	Statistics of Watersheds in Percentage of Total Area.				Percentage of Rainfall Reaching the Stream.											
		Woodland.	Cultivated.	Flats.	Roads.	Jan.	Feb.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.
Perkiomen, at Frederick, seven years	152	25	71	2	2	80	82	108	85	50	26	20	37	28	22	52	64
Neshaminy, below Forks, seven years	139.3	6	92	¼	?	92	98	102	78	29	16	17	20	16	21	41	81
Tohickon, seven years	102.2	24	72	2	?	108	117	120	91	32	25	22	27	28	29	57	69
Average.																	
Perkiomen, at Frederick — Maximum in seven years						93	111	191	114	49	39	40	62	50	49	78	75
Perkiomen, at Frederick — Minimum in seven years						72	49	65	41	29	13	8	16	17	9	25	32
Neshaminy, below Forks — Maximum in seven years						103	138	177	122	36	23	44	71	41	50	74	100
Neshaminy, below Forks — Minimum in seven years						77	70	62	43	18	5	2	9	3	2	14	47
Tohickon — Maximum in seven years						138	191	190	148	49	53	52	81	66	51	90	97
Tohickon — Minimum in seven years						73	64	90	42	17	9	2	7	2	2	18	49

TABLE 8.

Average Annual Yield of Sundry Streams, October 1st to September 30th.

Watersheds.	Area in square miles.	Rainfall.	Aver'ge annual yield in galls.	Average daily yield in galls.	Average yield in cubic feet per second per sq. mile of drainage area	Aver'ge yield in cubic feet per second per sq. mile of drainage area for each inch of rainfall.
Perkiomen, at Frederick, 7 yrs.	152.0	50.141	69,772,271,503	191,159,160	1.946	0.0388
Neshaminy, below Forks, 7 yrs	139.3	50.217	59,753,653,224	163,726,962	1.818	0.0362
Tohickon, 7 years.....	102.2	52.627	56,700,551,108	155,346,024	2.350	0.0446
Sunbury, Mass., 6 years.....	70.0	46.100	29,606,810,000	81,040,500	1.615	0.035
Croton, N. Y., 6 years.....	361.0	46.500	106,600,000,000	440,000,000	1.890	0.041

TABLE 9.

Observed Minimum Stream Flow and Minimum Flow, 1890.

Stream.	Previous Observed Minimum Flow.	Date.	Minimum Flow, 1890.	Date.
	Cubic ft. per 24 hours.		Cubic ft. per 24 hours.	
Perkiomen, at Frederick	653,184	Sept. 4, '85	3,153,600	July 14.
Neshaminy, below Forks	108,864	Sept. 28, '85	820,800	Aug. 14.
Tohickon.....	17,280	July 23, '85	319,680	July 23.

TABLE 10.

Observed Maximum Stream Flow and Maximum Flow, 1890.

Stream.	Cubic ft. per 24 hours.	Date.	Cubic ft. per 24 hours.	Date.
Perkiomen, at Frederick	458,352,000	Sept. 18, '88	349,764,480	March 22.
Neshaminy, below Forks	498,268,800	Feb. 11, '86	258,336,000	March 22.
Tohickon.....	479,174,400	Sept. 18, '88	254,188,800	March 22.

TABLE 11.—Yield of Sundry Streams for the Year 1890.

1890.	Perkiomen, at Frederick.			Neshaminy, below Forks.			Tohickon.		
	Monthly yield	Average daily yield.		Monthly yield.	Average daily yield.		Monthly yield.	Average daily yield.	
	Cubic feet.	Cubic feet.	Gallons.	Cubic feet.	Cubic feet.	Gallons.	Cubic feet.	Cubic feet.	Gallons.
January	725,189,760	23,393,218	174,993,412	521,570,880	16,824,867	125,858,738	485,550,720	15,662,927	117,166,823
February	1,267,920,000	45,284,250	338,749,692	960,871,680	34,871,680	260,858,277	897,497,280	32,053,474	239,776,621
March	1,967,664,960	63,473,063	474,811,483	1,660,720,320	53,571,623	400,743,544	1,611,869,760	51,995,800	388,906,594
April	921,030,640	30,701,088	229,660,085	574,456,320	19,155,210	143,290,920	422,219,520	14,073,984	105,280,708
May	1,124,694,720	36,280,475	271,397,796	484,254,720	15,621,120	116,854,085	723,081,600	23,325,213	174,484,699
June	329,590,080	10,986,336	82,184,490	343,759,680	11,458,680	85,716,878	177,577,920	5,919,264	44,279,168
July	380,738,880	12,281,899	91,875,082	196,015,680	6,323,086	47,299,967	210,660 480	6,792,273	50,809,729
August	389,626,720	12,568,604	94,019,685	169,525,440	5,468,562	40,907,682	215,818,560	6,961,889	52,079,546
September	462,568,320	15,418,944	115,341,704	100,033,920	3,334,464	24,943,521	290,157,120	9,671,904	72,350,866
October	827,487,360	26,693,141	199,678,548	701,680,320	22,634,849	169,320,426	857,321,280	27,655,525	206,877,681
November	309,044,160	10,301,472	77,060,361	252,815,040	8,427,168	63,039,593	162,648,000	5,421,600	40,556,382
December	399,098,880	12,874,154	96,305,358	440,873,280	14,221,719	106,385,843	362,733,120	11,701,068	87,557,066
Total	9,104,654,480	24,944,259	186,596,012	6,406,577,280	17,552,266	131,300,060	6,417,135,560	17,581,193	131,516,448

APPENDIX G.

REPORT OF JOHN E. CODMAN,

CHIEF DRAUGHTSMAN.

BUREAU OF WATER.

Philadelphia, January 17, 1891.

MR. JOHN L. OGDEN,
Chief, Bureau of Water.

SIR:—The following report of work under my charge in the draughting room, for the year 1890, is respectfully submitted:

One hundred and twenty-nine drawings of different subjects have been made. Ninety-nine of these have been recorded, forming a part of the records of the office. Those recorded comprise detail and general drawings, as follows:

Four drawings relating to buildings and grounds at Spring Garden Station; two for Belmont Station; fourteen for Roxborough; one for Kensington and two miscellaneous; three drawings and details of screens for Roxborough Station; nine drawings for Spring Garden Station and four for Frankford, showing details of new parts of engines and boilers for repairs, many requiring much care and attention both in design and construction.

Forty-one drawings have been made relating to locations, details of construction, and work pertaining to new reservoirs and those already in use; seven miscellaneous drawings on machinery of various kinds; four drawings of proposed work; two maps traced and several reports made.

Thirty drawings were made which were not recorded. Four

TOHICKON.

AREA OF WATERSHED, 102.2 SQUARE MILES.

	Rainfall in inches.	Percentage flowing off.	Inches collectible.	Monthly yield of stream.	Average daily yield of stream.	Average yield in cubic feet per second per square mile of drainage area.
				Cubic feet.	Cubic feet.	
Octo	4.573	51	2.332	554,541,120	17,888,423	2.026
Nove	8.860	90	7.974	1,900,264,320	63,342,144	7.173
Dece	1.987	97	1.919	460,261,440	14,847,143	1.681
Janu	2.815	73	2.055	485,550,720	15,662,927	1.773
Febr	4.725	80	3.780	897,497,280	32,053,474	3.532
Marc	6.772	94	6.366	1,611,869,760	51,995,800	5.522
April	2.482	71	1.787	422,219,520	14,073,984	1.594
May	6.300	49	3.087	723,081,600	23,325,213	2.641
June	3.930	19	0.747	177,577,920	5,919,264	0 673
July	5.812	15	0.872	210 660 480	6,792,273	0.769
Augu	5.752	16	0.920	215,818,560	6,961,889	0.788
Sept	2.985	41	1.224	290,157,120	9,671,904	1.095
To	6,993	57	32.486	7,949,499,840	21 779,451	2.435