DEPARTMENT

FOR

SUPPLYING THE CITY WITH WATER.

ANNUAL REPORT

OF THE

Chief Engineer of the Water Department

OF THE

CITY OF PHILADELPHIA,

Presented to Councils February,

1869.

PHILADELPHIA:

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1869.

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1868.

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ENGINEERS AT WORKS.

Fairmount Works—William Osborne, Joseph Moyer.
Schuylkill Works—William Hodges, Joshua Bartley.
Delaware Works—Benjamin F. Norman, Jos. Thompson.
Twenty-fourth Ward Works—James Buckley, William Gibler.
Germantown Works—William Wright, James Drinkwater.

REPORT.

To the Presidents and Members of
Select and Common Councils.

GENTLEMEN:—In compliance with an ordinance of Councils, the following report of the operations of the Water Department during the past year, and the present condition of the several important works under its charge, is submitted.

The substitution of a turbine wheel and new pumps for the old breast-wheels, Nos. 2 and 3, with the rebuilding and enlarging of the mill-house so as to accommodate this increase of power, has occupied considerably more time than was anticipated.

The quarrying out of the rock upon the site of the wheel, to a sufficient depth to utilize the entire fall of water (about thirteen feet below high-tide), proved tedious and difficult. The work had of course to be done by the use of a coffer-dam, and the larger part of it during the unusually severe weather of last winter.

The rock was exceedingly compact, wet, and difficult to get the proper face upon it to admit of rapid blasting.

Considerable delay has also occurred in the completion of parts of the machinery; the wheel is therefore but just ready to start.

It is the largest of the kind in the country, being ten feet three inches in diameter, and seventeen inches deep in the bucket; it will drive two double-acting force-pumps, twenty-two

inches diameter and six feet stroke; these will deliver their water into the reservoir, through a main thirty-six inches diameter and about two hundred and forty feet long.

The forebay not being of sufficient depth to admit of a main of such large size being put upon the bottom, it is suspended across the forebay nine feet above the ordinary level of the water on the dam, by means of wrought-iron suspension links, the main composed of flange-pipes forming the top or compression chord; lugs are cast upon the pipes at each end, to which are attached the links, which sustain the saddles upon which the pipe is supported.

The clear span between the abutments is seventy-seven feet. The main then rises at an angle of about forty-three degrees into the reservoirs at Fairmount, as these pumps are intended for the supply of those reservoirs only. Upon its discharge end it is provided with a double clack-valve, intended to prevent the reflux of the water should the main chance to be burst.

At the outlet of the wheel-pit is placed a drop-gate similar to those used for canal locks; by closing this, the wheel-pit may be pumped out, and the lower part of the wheel and step, which are below low tide, be examined or repaired. A pipe leads to a small well just outside of the main wheel-pit, into which will be placed the suction-pipe of a centrifugal pump, which will be driven by a small turbine wheel seven inches in diameter, supplied with water from the ascending main. The pump is so arranged as to be able to pump out two of the wheel-pits—the one now finished and that about to be built this year.

Plate No. 1 exhibits a section through the centre of the turbine wheel and flume. No. 2 shows the ground plan of the wheel and pumps. No. 3, a side view of the pump and gearing, and the suspended main, with sections of the saddles upon which it is supported. No. 4 shows a ground plan of the old mill-house, with the breast-wheels and pumps, and the house as enlarged, with the new wheels and pumps. It will be seen by the latter, that two of the ascending mains will be suspended together, and be carried up the hill into the reservoir at Fairmount;

one of these will also be attached to the stand-pipe on the brow of the hill, so as to enable its use either into Fairmount or Corinthian Avenue Reservoirs. The third main will be carried across the northern end of the forebay, and be attached to the base of the stand-pipe in the stone tower, now used in connection with turbines Nos. 10, 11, 12.

The delay in getting the machinery into place has prevented the completion of the roof and the interior of the mill-house; a temporary roof has been placed upon the unfinished part, and the wheel can be made useful as soon as it is ready to be started.

The mill-house at Fairmount is made familiar throughout the country by its age and the numerous published pictures; it was therefore thought desirable, in remodelling the works, not to alter the style of architecture. Its general external appearance will not be materially changed.

The whole work of enlargement has been done in the most substantial manner, with cut-stone walls, and roof of wrought-iron girders, with intermediate brick arches, supported upon wrought-iron columns. The whole, when completed, will be fire-proof, enduring, and suitable for a work of the importance and magnitude required for the supply of water to a large city.

The designs for the new building, head-gates, pumps, flume, suspended main, and complete arrangement of the work, are by the Chief Engineer of the Department. The wheel and its gearing were designed by Mr. Emile Geyelin, the contractor for the erection of the machinery.

The machinery has been executed by different parties, under Mr. Geyelin's contract. The pumps, connecting rods, &c., are from the shop of I. P. Morris & Co. The gearing and shafting from the West Engine Company, of Norristown. The turbine wheel and its gate-hoist, from the shop of Mr. Geyelin. The wrought-iron flume and forebay head-gates were not comprised in the contract, and were made for the Department by Messrs. Hunsworth & Naylor.

Much difficulty was experienced during the summer in keep-

ing up the supply of water to the proper standard, and constant vigilance was necessary to prevent, as far as possible, the inordinate waste of water usual during the summer months.

This difficulty was of course increased by the delapidated condition of the old breast-wheels and pumps, referred to fully in my report of last year. All the old pumps are more or less cracked, some of them so much patched as to leave no room for other additions. No. 7 at the present moment is useless. A new valve-chamber was ordered early last year, to have on hand as a safeguard in case of any of the pumps giving out entirely during the summer; this will now be used for No. 7, together with such parts of No. 4 (now about to be taken out) as are fit to use; we may thus be able to make one moderately good pump out of the parts of two.

During the season new head-gates to the forebay have been provided and put in place, the old ones being entirely unreliable.

A cast-iron head-gate to wheel No. 9 has been put in, with a sluice-gate under it, whereby the forebay may be drained when required.

The wharf at Coates street has been rebuilt, from low-water upward, and a new wharf fifty feet long added to its western end, which materially assists in preventing objectionable floating matter passing into the wheels, by deflecting it over the dam before it reaches the inlet to the forebay.

Turbine wheels Nos. 10, 11, 12, have done extraordinary duty during the year, for upon them and No. 9 the supply mainly depended; they required but little more than the ordinary attention of heavy machinery, with the exception of No. 11, which has had a new bevel mortice wheel, and the bracing of the bridges of the counter-shafts, which have always been wanting in firmness; during the winter the gearing will all be recogged.

The reservoirs at Fairmount required but little attention, excepting No. 1, which has had the lining completely renewed above the stone walls; all are now in good condition, as well as

the banks and grounds surrounding them; a large portion of the grass-beds in the garden on the Callowhill street side of the works, have been resodded, and the brick-walks widened and repaved.

The walk upon the north-west angle of the reservoir which was so steep as to be dangerous in winter, has been regraded and considerably improved, and now affords a pleasant means of access to the upper banks.

At Schuylkill Works, much labor has been performed in quarrying off the bluff of rocks, and building a wall some three hundred feet in length and seven feet high, to prevent a recurrence of the disaster which filled the forebay with sand the previous summer; the forebay is now believed to be safe from the disastrous effects of any similar flood.

The engine-house has had the principal rafters which were rotton, renewed, and the roof has been covered with slate in place of the tin formerly on, the latter material being unsuited for a work of the kind, where escaping steam from the safety-valves is apt to rapidly rust out the metal.

Engine No. 1, which had been useless for several years, has been taken down, and the foundations are in a forward state for receiving the new Cornish engine about to be erected in its place.

The engine is almost completed in the shop of the contractors, much of the machinery is already delivered at the works, and its erection commenced.

It is to be a side-lever Cornish engine, from the general designs of the Chief Engineer; the constructors, Messrs. Merrick & Sons, are, however, by their contract, made responsible for the design of the details and strength of parts.

Plate No. 5 exhibits a side elevation of the engine and pump; it will be seen that it differs from ordinary Cornish engines, in having the heavy lever-beams placed down upon the sides of the cylinder, with their bearings resting directly upon the bed-plate and stone foundations, instead of overhead, in the usual

manner. The advantage of this form being, that the heavy and expensive supports required when the beams are placed above are avoided, and in consequence, bracing to the side walls of the building are not required. This is of great importance when the old and weak walls of the house, and the weight of the beams (about 56,000 pounds) are considered. The size of the engine is 72-inch diameter of cylinder, and ten feet stroke, and the pump thirty-six inches diameter of plunger, also of ten feet stroke; the machine will be capable of raising seven million five hundred thousand gallons of water per twenty-four hours. A main of thirty-six inches diameter will be laid from this engine to the reservoir; all the pipes having been delivered, the work can be commenced early in the spring. That part of it, however, which will pass through the tunnel on Thompson street, in which are now laid three other ascending mains, will be laid during the winter, as it will require the temporary removal of one of the present mains, which can be better spared when the demand for water is light.

The tunnel being of limited size, the centre main now there will require to be shifted to the top of the adjoining main, in order to make room for the new 36-inch; this will of course be a troublesome and expensive job, but to have taken the main up Girard avenue, would have much increased the length of the pipe and put more labor upon the engine.

A sum intended for a new set of boilers and a boiler-house for the use of the new engine, was included in the loan asked for last spring, but only just passed; the delay in granting this loan has seriously embarrassed the Department, not only at this work but at Fairmount, where the want of it has entailed an expense of four or five thousand dollars, which might have been saved if the loan had been obtained earlier.

It was intended to have repaired the wharf at these works, but as the Park Commission proposed (had the loan for the purpose been passed in time) to build a retaining wall and the river road in front of the works, it was not considered necessary.

During the summer, the lower valve chamber of the Cornish engine was found to be badly cracked; it had to be removed and a new one constructed; it is believed that it was originally injured during the time when the floods of 1866 filled the forebay with gravel, when it was impossible to prevent sand and small stones getting under the valve; the work was quite costly, and has caused considerable increase in the usual annual running expenses.

The cross-head of the Sutton engine broke from an old but hidden fracture, causing the breaking of two of the connecting rods on one side of the engine, and other damage; it was promptly repaired, and caused but a few days' delay. All the boilers have been carefully examined, and new heads put into the heaters of those usually used with the Cornish engine.

The original tubular boilers which have now been in use for twenty-four years, are almost unsafe to be run, and should be taken out as soon as the boilers intended for the new engine can be erected.

The small Worthington Duplex engine purchased as an auxiliary, was exceedingly useful during the greatest demand for water; its action was in every way entirely satisfactory; it is now being removed to Twenty-fourth Ward Works, to be used as an assistant next summer.

The reservoir and grounds attached to these works are in excellent order.

The Delaware Works have been driven hard during the summer; the inadequate height of the stand-pipe and the small size of the ascending main, does not, however, admit of the engines being run quite as fast as they might be but for the defects named.

A new engine can be placed in the present engine-house, but would require a new ascending main and the raising or enlargment of the stand-pipe; this work cannot be much longer delayed, as the district supplied by the works is improving rapidly with many new manufactories, requiring large quantities of water.

A main of larger size will also be necessary to supply Frankford; the one now in use being but twelve inches diameter.

A special report upon these subjects will be made hereafter. The condition of the water supplied by the works has been satisfactory; no complaints in regard to it have reached the Department.

The old engines at the Twenty-fourth Ward Works, have stood the excessive demand of the summer remarkably well; they have been repaired as far as is possible, but are in a very precarious and dilapidated condition. The Worthington engine purchased and used to great advantage as an auxiliary to the Schuylkill Works, will be erected here as an assistant, until the new engines and reservoir is completed.

Much labor has been done at the new reservoir on Belmont avenue; considerably more rock has been found, than the sinking of test-holes before the work was commenced indicated. Much of the excavation is composed of loose stones and soil, unfit to be placed upon the embankments; this has therefore to be hauled to points outside the limits of the reservoir, considerably increasing the cost of the work. In laying out the work, it was so arranged that the excavation from the centre should be sufficient to make up the embankment, but from the necessity above named, of rejecting so much of the material unfit for the banks, the quantity of suitable earth obtained will not be sufficient to complete the embankments.

At the north-west corner of the reservoir no embankment is required, and the earth is good; it is therefore proposed to enlarge the reservoir at this point, in order to obtain earth sufficient to make up the deficiency.

This can readily be done, as the ground surrounding the location is now Park property, and streets that would but for this, have confined the bounds of the reservoir, will now be vacated.

The cost of this work will be much increased, in consequence of the quantity and remarkable hardness of the rock found, and the greater care required to guard against leakage through the fissures in its almost vertical strata. It is also found exceed-

ingly difficult to obtain a sufficient supply of suitable material for puddling.

In my report to Councils, made some few weeks after taking my position as Chief Engineer of the works (see Appendix 170 to Journal of Select Councils), I called attention to the fact that the estimates previously made for the work, were entirely inadequate; the amount appropriated was exhausted in October last. The loan just passed will provide a sum to go on with the work.

Much delay occurred in obtaining possession of the property purchased for the new engine-house at Belmont Cottage; in consequence, the building could not be commenced until November. Considerable advance has however been made in the engine and boiler-house, and the excavation necessary for them. Nearly all the materials for the construction have been delivered upon the ground, so that there should be but little delay in going on with the work early in the spring.

Contract for a pair of Duplex Pumping Engines, capable of raising five million gallons per twenty-four hours each, was made with Mr. Henry R. Worthington, in September last, and considerable progress is made with the work in the shop of the contractor.

All the castings for the 30-inch ascending main to the reservoir are delivered, ready to be laid.

The 20-inch pipes for the descending main on Belmont avenue are delivered, and 5468 feet of it, from the reservoir southward, are already laid.

An addition to this main to extend from Belmont avenue to Fortieth street, on Lancaster avenue, is positively necessary before the ward can be properly supplied from the new reservoir; a sum is included in the loan just passed for this object.

The building of the Cornish engine at Roxborough has proceeded very slowly; I am happy to say that it is at length finished sufficiently to commence supplying water to the reservoir, which has been completed ready for use for over six months.

The supply-main from the reservoir on Ridge avenue to Green lane, Manayunk, and that on the Main street, has been laid; that on Green lane will be finished in a few days; the excavation on the latter street was almost all rock, and has required much time and expense.

But little distributing pipe has yet been applied for or laid, and very little anxiety has been exhibited by the citizens of Manayunk or Roxborough, to take the water.

The 20-inch main intended for the supply of Germantown, has all been delivered excepting that part intended to cross the Wissahickon Creek, and about three thousand feet of it has been laid; the trench for this main will be almost exclusively through rock; the excavation will therefore be tedious and expensive: it will be prosecuted with all possible dispatch, and be recommenced as early as the season will permit.

The Germantown Works are in moderately good condition, but are becoming rapidly inadequate to the demand upon them. It is confidently hoped that this district may be supplied from the Roxborough Works before the expiration of the present year.

All the works were driven to the utmost during the hottest months of the summer; the deficiency in power was very apparent.

The increase of power at Fairmount and Schuylkill Works will be of marked advantage, and much relieve the Department.

Much inconvenience is felt from the inadequate size of most of the supply mains; and also by the rapid extension of the City in the Twentieth and other wards, where the ground is at too high a level to be properly supplied from any of the existing reservoirs.

It is believed that a suitable location for a new reservoir for the supply of the part of the City referred to, is included within the bounds of the Park, and will soon be the property of the City. When this is the case, a special report upon the propriety of erecting reservoirs will be made.

The report of the Register exhibits a very satisfactory increase in the revenue of the Department.

Legislation is required for the proper control of plumbers and builders, and water consumers generally. The old ordinances having to a certain extent become inoperative, new ones are prepared, and will be presented for your approval at an early date.

It is very desirable that the use of meters should be commenced in this City, now the only one of any pretension where they are not employed. In Chicago about one-tenth of the whole supply of the place is sold by measure through meters.

In Boston, nearly $150,000 has been expended in the purchase of these useful apparatus. New York and Brooklyn have probably a like amount. They are also used extensively in Jersey City, Albany, Detroit, and almost all large cities that have water supply.

It is of course only proposed to measure the water supplied to large consumers, where difficulty is now experienced in making reliable assessments—such as manufactories, breweries, distilleries, hotels, &c.

Wherever meters have been introduced they have given satisfaction, not only to the supplier, but to the consumer. Without them the proper rent can only be approximated, and it is possible that the consumer may frequently be over-taxed, or the reverse. By the meter system, he pays only for what he actually consumes.

The Engineer Corps of the Park Commission have made a survey for the construction of a road upon the banks of the river, at the same time making sufficient levels to enable a judgment to be formed of the practicability of building a sewer for the purpose of conducting the objectionable drainage of Manayunk to a point below the dam. It is believed to be quite possible to thus relieve the Schuylklll from pollution by the drainage referred to.

Your attention will be called to this important subject more fully in a future report.

Professor Chandler, of New York, in a recent report made to the Metropolitan Board of Health, gives the following table,

from which it will be seen that the water supplied to our City compares favorably with that furnished to other places:

RESULTS CALCULATED FOR PARTS OF MATTER IN 100,000 PARTS OF WATER.

Cities Supplied.	Source of Water.	Inorganic Matter.	Organic and Volatile.	Total Solids.
Boston	Cochituate, Boston..... Prof. E. N. Horsford.	4.12	1.22	5.34
Delaware River....	Trenton..... Prof. H. Wurtz.....	5.02	0.95	5.97
Philadelphia.....	Schuylkill, Fairmount. Poof. E. N. Horsford	3.95	2.06	6.01
Do.	Delaware..... Prof. H. Wurtz.....	4.97	1.08	6.05
Brooklyn.....	Ridgewood..... Prof. Eaton.....	4.49	1.79	6.28
New York.....	Croton..... Prof. C. F. Chandler..	6.72	1.12	7.84
Cleveland.....	Lake Erie ..... Prof. J. L. Cassels....	8.13	2.62	10.75
Utica.....	..... Prof. Chandler.....	9.43	1.64	11.07
Chicago.....	Lake Michigan..... Prof. Blaney.....	9.63	1.81	11.44
Troy.....	..... Prof. Elderhorst.....	10.44	2.30	12 74
Jersey City..... Newark	Passaic River..... Prof. E. N. Horsford	7.85	4.90	12.75
Paris.....	Seine.....	13.43	1.70	15.13
Albany.....	..... Prof. Horsford.....	14.52	3.96	18.48
Paris.....	Reservoir Montmaitre	17.73	3.50	21.23
Rochester.....	Genesee River..... Prof. Chandler.....	20.62	2.12	22.74
Paris.....	Reservoir Passy	19.81	3.20	23 01
London	West Middlesex Co..... Prof. Lethely.....	22.60	1.21	23 81
Syracuse.....	..... Prof. Chandler.....	20.81	3.08	23.89
London.....	New River Co..... Prof. Lethely.....	23.93	0.35	24.28
Do.	Lambeth Co..... do.	25.36	1.78	27.14
Do.	South'k & Vauxhall Co. do.	25.78	1.43	27.21
Do.	East London Co..... do.	26.71	0.71	27.42
Do.	Grand Junction Co..... do.	26.67	1.43	28.10
Amsterdam.....	River Vecht	24.78	3.66	28.44
Stockholm.....	Maeler Lake.....	47.	7.	54.

The amount of distributing pipe laid has been about one mile less than that put down in 1867.

The expenditures of the Department have been exceedingly heavy (amounting in the aggregate to $802,217 46), much greater than in any one year before. This is of course due to the largely increased amount of work required and performed, in extending and increasing the efficiency of the works.

Operations of Fairmount Works for the year 1868.

MONTHS.	Running time.	Number of Strokes during the month.	Average Strokes per minute.	Total number of Gallons pumped during the month	Average gallons per day.	Cubic feet of Water pumped per month.	Average depth of Water passing over the Dam, in inches.	Rain-fall during each month, in inches.	Average temperature.
	Days.								
January	31	2,871,579	9 87	531,713,063	17,152,067	71,079,698	$8\frac{54}{100}$	$3\frac{62}{100}$	$30\frac{12}{100}$
February	29	3,542,630	11.77	679,114,792	23,417,751	90.784,442	$4\frac{46}{100}$	$2\frac{52}{100}$	$26\frac{65}{100}$
March	31	4,408,045	13.09	618,729,000	19,959,000	82.618,374	18	$3\frac{36}{100}$	$41\frac{12}{100}$
April	30	3,486,545	10.78	656,033,361	21,867,778	87,599,594	$13\frac{53}{100}$	$5\frac{44}{100}$	$48\frac{24}{100}$
May	31	3,399,654	10.03	672,852,326	21,704,914	89,845,416	$13\frac{88}{100}$	7	$59\frac{66}{100}$
June	30	3,969,249	12.27	741,597,729	24,719,924	99,025,069	$11\frac{23}{100}$	$4\frac{37}{100}$	72
July	31	3,770,961	10 50	748,059,045	24,130,937	100,000,949	$8\frac{88}{100}$	$3\frac{51}{100}$	$80\frac{94}{100}$
August	31	4,081,518	11.70	780,987,078	25,196,357	101,284.428	$7\frac{9}{100}$	$2\frac{06}{100}$	$78\frac{42}{100}$
September	30	3,001 648	10.81	600,486,558	20,016,218	80,182,475	$13\frac{42}{100}$	$8\frac{91}{100}$	$68\frac{8}{100}$
October	31	3,619,420	12.09	729,914,894	23,545,642	97,464,934	$1\frac{73}{100}$	$6\frac{61}{100}$	54
November	30	2,707,223	11 27	586,099,627	19,536,654	78,261,387	$16\frac{48}{100}$	$5\frac{28}{100}$	$46\frac{91}{100}$
December	31	3,315,560	11.82	678,943,438	21,901,401	90,658,745	$11\frac{93}{100}$	$3\frac{58}{100}$	$32\frac{16}{100}$
Total	366	42,174,032	11.33	8,024,530,911	21,929,053	1,071,805,511			

Total rain-fall for the year, $57\frac{38}{100}$ inches.
Average rain for thirty-one years, $45\frac{71}{100}$ inches.
Total rain for the year 1867, $61\frac{1}{8}$ inches.

Highest water over the Dam during the year, was 47 inches.

Coal, Tallow and Oil Account of Fairmount Works for 1868.

MONTHS.	COAL.		TALLOW.		OIL FOR MACHINERY.	
	Amount of Coal received	Amount of Coal consumed.	Amount of Tallow received.	Amount of Tallow consumed.	Amount of Oil received.	Amount of Oil consumed.
	Tons.	Tons.	Pounds.	Pounds.	Quarts.	Quarts.
Amount on hand January 1	31	.....	499	.....	892	.....
January	.....	.....	.....	20	.....	124
February	25	.....	.....	19	.....	115
March	.....	.....	.....	19	.....	123
April	.....	.....	.....	40	.....	133
May	.....	.....	314	35	.....	155
June	.....	.....	.....	43	884	148
July	.....	.....	.....	37	.....	172
August	.....	.....	324	35	.....	180
September	.....	.....	.....	36	.....	179
October	25	.....	.....	48	880	130
November	15	.....	.....	28	.....	130
December	25	.....	.....	16	.....	155
Total	121	91	1,137	376	2,656	1,741

Running Expenses of Fairmount Works.

Salaries of Engineers and Labor, - - -	$5,000 00
Gas and Oil for Lighting, - - - -	893 78
90 tons of Coal for Warming Works, - -	585 00
441 gallons of Oil, - - - -	319 70
638 pounds of Tallow, - - - -	97 95
Packing and Small Stores, - - -	750 00
Repairs, - - - - - -	7,426 40
	$15,072 83
Cost of raising water into reservoir, per million gallons, - - - - -	$1 87 $\frac{8}{10}$
Cost of raising water per million gallons, one foot high, - - - - - -	01 $\frac{8}{10}$

Operations of the Schuylkill Water Works during the year 1868.

MONTHS.	Running time.	Number of strokes during the month.	Average strokes per minute.	Pounds of coal used during the month.	Total number of gallons pumped during the month.	Average gallons per day.	Number of gallons per pound of coal.	Number of pounds of water one foot high, per pound of coal. Lift calculated at 115 feet.	Number of pounds of water one foot high, per pound of coal. Lift calculated at 138 feet.	Cubic feet of water pumped per month.
	Days.									
January	29	769,893	14.00	406,448	122,250,834	4,215,546	300.78	288,996	346,796	16,342,559
February	29	504,811	15.64	252,112	80,064,124	2,760,832	317.57	305,134	366,161	10,703,010
March	31	664,657	14.20	371,504	146,045,914	4,711,158	393.12	377,294	479,670	19,501,390
April	30	406,383	10.36	347,586	125,762,762	4,192,092	361.87	347,301	416,762	16,792,998
May	31	723,671	12 07	452,144	195,287,554	6,299,598	431.91	414,325	497,431	26,076,586
June	30	983,020	12.70	617,884	234,056,246	7,801,875	378.80	363,537	436,244	31,252,002
July	31	1,171,093	12 80	631,120	270,293,562	8,719,147	428.27	411,500	538,944	36,132,993
August	31	1,076,246	12.76	720,160	267,920,090	8,642,583	372.03	358,383	430,060	35,908,678
September	30	1,510,565	12.70	837,200	313,362,122	10,445,404	374.29	357,982	431,012	41,836,844
October	31	1,019,843	10.46	706,272	262,866,312	8,463,429	371.48	356,525	427,830	35,038,557
November	30	877,601	12.86	636,944	226,823,872	7,560,795	356.11	341,956	410,348	30,287,605
December	31	191,600	9.04	339,024	93,132,250	3,004,266	274,70	263,653	316,377	12,435,872
Total	364	9,899,383	12.46	6,318,348	2,337,365,642	6,401,394	363.41	348,882	424,803	312,304,094

Coal, Tallow and Oil Account of Schuylkill Works for 1868.

MONTHS.	COAL.								TALLOW.		OIL FOR MACHINERY.	
	Amount of Coal received.				Amount of Coal consumed.				Amount of Tallow received.	Amount of Tallow consumed.	Amount of Oil received.	Amount of Oil consumed.
	Tons.	Cwt.	Qrs.	Lbs.	Tons.	Cwt.	Qrs.	Lbs.	Pounds.	Pounds.	Quarts.	Quarts.
Am't on hand January 1	1,296	07	0	0					373	.....	844	....
January...	504	03	0	0	181	09	0	0	367	117	164	77
February.	.....	.....	...	...	112	11	0	0	.....	73	.....	63
March.. ...	.....	.....	...	...	165	17	0	0	.....	121	.....	68
April.....	.....	.....	...	...	155	03	0	0	315	119	.....	46
May..	.....	.....	...	...	201	17	0	0	.....	176	.....	50
June.	.....	.....	...	...	275	17	0	0	356	228	.....	94
July.....	112	15	0	0	281	15	0	0	221	221	.....	65
August. ...	336	16	0	0	321	10	0	0	308	260	.....	78
September	291	10	0	0	373	15	0	0	.....	243	.....	85
October ...	407	05	0	0	315	06	0	0	.....	231	.....	81
November	121	18	0	0	284	07	0	0	.....	219	.....	52
December	267	08	0	0	151	07	0	0	.....	115	.....	34
Total....	3,338	02	0	0	2,820	14	0	0	1,940	2,123	1,008	793

Running Expenses of Schuylkill Works.

Salaries of Engineers, Firemen, &c., - -	$8,300 00
Gas for Lighting the Works, - - -	674 98
2,041 15/20 tons of Coal, - - - -	9,370 22
41 gallons of Oil, - - - - -	51 25
1,567 pounds of Tallow, - - - -	242 00
Packing and Small Stores, - - -	825 00
Repairs, - - - - - -	7,375 23
	$26,838 68

Cost of raising water into reservoir, per million gallons, - - - - - -	11.48 3/10
Cost of raising water per million gallons, one foot high, - - - - - -	.09 9/10

Operations of the Delaware Water Works, during the year 1868.

MONTHS.	Running Time. Days.	Number of strokes during the month.	Average strokes per minute	Pounds of Coal used during the month.	Total number of gallons pumped during the month.	Average gallons per day.	Number of galls. per pound of coal.	Number of pounds of water, one foot high, per pound of coal. Lift calculated at 112 feet.	Number of pounds of water, one foot high, per pound of coal. Lift calculated at 135 feet.	Cubic feet of water pumped per month.
January	6	41,606	10.20	54,546	7,073,020	1,178,837	129.67	121,158	146,249	945,525
February	1	14,425	10.45	39,560	2,452,250	2,452,250	61.99	58,006	69,918	327,818
March	14	107,174	7.43	110,886	18,219,580	1,301,399	164.30	153,580	185,119	2,432,846
April	10	89,688	12 87	84,284	13,292,420	1,329,242	157.71	148,599	177,687	1,774,926
May	22	168,182	12.13	176,685	28,590,940	1,299,589	161.81	151,819	182,312	3,817,725
June	26	404,612	11.13	334,180	68,784,040	2,645,540	205.82	192,389	228,906	9,184,676
July	31	689,422	11.56	578,237	112,379,310	3,625,139	194.35	181,857	219,203	15,022,349
August	31	729,452	11.10	585,618	118,899,320	3,835,462	203.03	189,777	228,747	15,876,528
September	30	685,149	10.09	667,288	112,730,410	3,757,680	168 94	157,906	190,183	15,052,665
October	30	576,900	10.28	571,262	94,306,980	3,143,566	165.08	154,306	273,519	12,592,733
November	27	526,755	14.78	414,210	84,280,800	3,121,511	203.47	190,190	229,007	11,253,944
December	22	277,708	12.21	243,364	44,433,280	2,019,694	182.58	170,658	205,704	5,933,139
Total	250	4,302,073	11.19	3,860,120	705,442,350	2,475,825	166.56	155,854	194,713	94,214,874

Coal, Tallow and Oil Account of Delaware Works, for 1868.

MONTHS.	COAL.								TALLOW.		OIL FOR MACHINERY.	
	Amount of Coal received.				Amount of Coal consumed.				Amount of Tallow received.	Amount of Tallow consumed.	Am't of Oil received.	Am't of Oil consumed.
	Tons.	Cwt	Qrs.	Lbs.	Tons.	Cwt	Qrs.	Lbs.	Lbs.	Lbs.	Qts.	Qts.
Am't on hand January 1st,	300	...	...	...	.....	...	...	...	175	.....	36	.....
January.....	.....	...	...	...	24	07	0	2	.....	4	.....	6
February.....	.....	...	...	...	17	13	0	24	.....	0	.....	1
March.....	.....	...	...	...	49	10	0	6	.....	6	176	9
April.....	.....	...	...	...	37	12	2	4	.....	6	.....	4
May.....	.....	...	...	...	78	17	2	5	.....	12	.....	9
June.....	.....	...	...	...	149	3	3	0	.....	20	.....	14
July.....	293	...	...	...	258	2	3	9	.....	20	.....	24
August	402	...	...	...	261	8	2	26	.....	20	.....	28
September...	418	04	...	...	297	17	3	20	289	26	.....	25
October.....	.....	...	...	...	255	0	2	6	.....	24	.....	22
November....	526	...	...	...	184	18	1	6	.....	14	170	15
December....	274	...	...	...	108	12	3	16	.....	18	.....	14
Total.....	2,213	4	0	00	1,723	05	1	12	464	170	382	171

Running Expenses of Delaware Works.

Salaries of Engineers, Firemen, &c., - - -	$5,660 72
Gas for Lighting Works, - - - - -	290 79
1,911 $\frac{4}{20}$ tons of Coal, - - - - - -	10,321 09
86½ gallons of Oil, - - - - - -	62 68
289 pounds of Tallow, - - - - -	44 35
Packing and Small Stores, - - - - -	496 22
Repairs, - - - - - - - - -	2,743 40
Wood, - - - - - - - - -	45 00
	$19,664 25

Cost of raising water into reservoir, per million gallons, - - - - - - - -	$27 87 $\frac{3}{10}$
Cost of raising water, per million gallons, one foot high, - - - - - - - -	24 $\frac{8}{10}$

Operations of the Twenty-fourth Ward Water Works, during the year 1868.

MONTHS.	Running Time. Days.	Number of strokes during the month.	Average strokes per minute.	Pounds of Coal used during the month.	Total number of gallons pumped during the month.	Average gallons per day.	Number of gals. per pound of coal.	Number of pounds of water one foot high, per pound of coal. Lift calculated at 180 feet.	Number of pounds of water, one foot high, per pound of coal. Lift calculated at 230 feet.	Cubic feet of water pumped per month.
January	31	618,597	13.86	208,300	55,673,550	1,795,921	267.27	401,958	513,612	7,442,471
February	29	553,280	13.25	193,900	49,795,200	1,717,076	256.80	386,216	493,498	6,656,650
March	31	565,397	12 69	203,400	50,885,730	1,641,478	250.17	375,814	480,207	6,794,729
April	30	564,177	13.06	211,100	50,775,930	1,692,531	240.53	361,825	461,698	6,780,068
May	31	643,461	14.41	229,300	57,911,490	1,868,113	252.56	379,393	484.779	7,732 873
June	30	694,259	16 01	253,700	62.483,310	2.082,777	246.29	369,975	472,746	8,343.345
July	31	839,528	18.80	357,300	75,557,520	2.437,339	211.44	318,028	406,369	10,100,571
August	31	794,330	17.79	363,300	71,489,700	2,306,119	196.78	295,601	377,713	9,545,961
September	30	780,950	18.07	349,300	70,285,500	2,342,850	201.22	302,270	386,235	9,385,165
October	31	744,628	16.69	307,500	67,016,520	2,161,823	217.94	324,138	418,331	8,948,660
November	30	667,412	15.45	300,000	60,067,080	2,002,236	200.22	300,776	384,325	8,020,708
December	31	620 925	13.90	279,700	55,883,250	1,802,685	187.70	300,136	383,507	7,462,044
Total	366	8,086,944	15.33	3,256,800	727,824,780	1,987,579	227.41	342,969	438,585	97,213,245

Coal, Tallow and Oil Account of Twenty-fourth Ward Works, for 1868.

MONTHS.	COAL								TALLOW.		OIL FOR MACHINERY	
	Amount of Coal received.				Amount of Coal consumed.				Amount of Tallow received	Amount of Tallow consumed.	Am't of Oil received.	Am't of Oil consumed
	Tons.	Cwt	Qrs.	Lbs.	Tons.	Cwt	Qrs.	Lbs.	Lbs.	Lbs.	Qts.	Qts.
Am't on hand January 1st,	99	05	1	12	.....	...	...	...	505	.....	78	.....
January.....	30	15	0	20	92	19	3	8	.....	24	.....	3
February.....	80	16	3	09	86	11	1	0	.....	28	.....	3
March...	80	14	0	27	90	16	0	8	.....	38	.....	5
April.....	101	1	3	14	94	4	3	8	.....	28	.....	3
May...	103	4	3	18	102	7	1	8	.....	28	.....	3
June.....	102	17	3	12	113	5	0	20	.....	32	.....	3
July...	171	5	3	1	159	8	1	16	.....	30	.....	4
August.	195	9	0	22	162	3	3	0	237	28	.....	3
September...	127	7	1	13	155	18	3	0	.....	25	.....	4
October... ...	131	8	0	0	137	5	2	4	.....	24	.....	3
November. ...	105	15	0	0	133	18	2	8	.....	22	.....	4
December. ...	.....	...	...	...	124	17	1	8	.....	28	.....	4
Total.....	1,330	01	2	08	1,453	16	3	04	742	335	78	42

Running Expenses of Twenty-fourth Ward Works.

Salaries of Engineers and Firemen,	$4,400 00
Coal Oil for Lighting,	130 56
1,230$\frac{16}{20}$ tons of Coal,	5,999 93
237 pounds of Tallow,	36 55
Packing and Small Stores,	407 75
Repairs,	1,056 59
	$12,031 38

Cost of raising water into stand-pipe, per million gallons,	$16 53
Cost of raising water, per million galls., one foot high,	$07\frac{18}{100}$

Operations of the Germantown Water Works during the year 1868.

MONTHS.	Running Time. Days.	Number of strokes during the month.	Average strokes per minute	Number of pounds of Coal used during the month.	Total number of gallons pumped during the month.	Average gallons per day.	Number of galls. per pound of coal.	Number of pounds of water, one foot high, per pound of coal. Lift calculated at 230 feet.	Cubic feet of water pumped during the month.
January	27	1,617,000	25 77	138,880	13,754 200	509 415	99.04	190,316	1,838,669
February	25	1,562,000	25 25	141,120	14.158.200	566,328	100 33	192,795	1,892,676
March	29	1,702,000	26.68	143,360	15,345,200	529,145	107 04	205,461	2.049,032
April	26	1,571,000	26.36	118,480	14,332,600	551,254	120 99	232,200	1,913,820
May	26	1,566,000	26.02	105,280	14,219,600	546,908	135.06	259,254	1,898,732
June	26	1,910,000	26 87	127,680	17,337,000	666,808	135.80	260,636	2,314,995
July	29	2,118,000	27.60	141,120	19.165,800	660,890	135.81	260,984	2,562,094
August	28	1,965,000	26.35	170,240	17,837,000	575,387	104.77	201,104	2,381,626
September	26	1,791,000	25.77	147,840	16,220,600	623,869	109.71	210,600	2,165,923
October	27	1,768,000	24 59	176,960	16,000,800	592,622	90 42	173,561	2,136,574
November	26	1,756,000	26 04	176,960	15,919,600	612,292	89.96	171,595	2,112 378
December	27	1,736,000	24.79	185,920	15,724,600	582,393	84.58	162,344	2,099,693
Total	322	20,962,000	25 96	1,773,840	190,015,200	584,776	109.46	210,071	25,366,212

Coal, Tallow and Oil Account of Germantown Works for 1868.

MONTHS.	COAL.								TALLOW.		OIL FOR MACHINERY.	
	Amount of Coal received.				Amount of Coal consumed.				Amount of Tallow received.	Amount of Tallow consumed.	Am't of Oil received.	Am't of Oil consumed.
	Tons.	Cwt	Qrs.	Lbs	Tons.	Cwt	Qrs.	Lbs.	Lbs.	Lbs.	Qts.	Qts.
Am't on hand January 1st,	.....	...	...	..	.....	...	...	...	111	.....	46	.....
January.....	55	...	...	...	62	...	...	...	.....	22	.....	9
February	66	...	...	...	63	...	...	...	.....	18	.....	8
March.....	67	...	...	...	64	...	...	...	.....	22	.....	9
April	44	...	...	...	52	...	...	...	.....	25	.....	10
May.....	51	...	...	...	47	...	...	...	287	24	172	9
June.....	93	...	...	...	57	...	...	...	.....	26	.....	11
July	20	...	...	...	63	...	...	...	.....	34	.....	12
August.....	86	13	0	4	76	...	...	...	.....	33	.....	11
September...	64	5	2	24	66	...	...	...	.....	40	.....	11
October... ...	76	6	3	4	79	...	...	...	.....	45	.....	12
November ...	77	13	2	8	79	...	...	...	.....	40	.....	12
December....	.....	...	...	...	83	...	...	...	.....	39	.....	13
Total.....	700	19	0	12	791	...	...	..	398	368	218	127

Running Expenses of Germantown Works.

Salaries of Engineers, Firemen, &c.,	$3,497 25
Coal Oil for Lighting Works,	30 70
700 18/20 tons of Coal,	4,059 30
43 gallons of Oil,	32 25
287 pounds of Tallow,	44 35
Packing and Small Stores,	73 29
Repairs,	745 54
	$8,482 68
Cost of raising water into reservoir, per million gallons,	$44 64 2/10
Cost of raising water, per million gallons, one foot high,	19 4/10

Amount of Water pumped by all the Works during the year 1868.

	Gallons of water pumped during the month.	Average number of gallons pumped per day.
January	730,464,667	24,851,786
February	825,584,566	30,914,237
March	849,225,424	28,142,180
April	860,197,073	29,632,897
May	968,861,910	31,719,122
June	1,124,258,325	37,916,924
July	1,225,455,237	39,573,452
August	1,257,133,188	40,555,908
September	1,113,085,190	37,186,021
October	1,169,605,506	37,907,082
November	973,190,979	32,833,488
December	888,116,818	29,310,439
Total	11,985,178,883	33,378,628

Statement of the Operations of the Shop, from January 1st to December 31st, 1868.

DR.

To Stock on hand, January 1st, 1868,		$3,837 52
" 41,132 lbs. wrought iron,		2,483 97
" 229,406 " cast iron,		7,043 12
" 11,864½ " brass castings,		2,702 58
" 6,678 " lead,		667 80
" Lumber,		1,381 33
" Hardware,		815 35
" Leather and gum,		291 92
" Paints and oils,		492 00
" Coal,		558 75
" Machine work,		1,424 96
" Scrap iron and brass from the various districts and works,		200 00
" Wages paid hands,		10,914 50
		$32,813 80

CR.

By 2,501½ ferrules,	½ in.,	at 60 cents,		$1,500 60	
" 257 "	⅝ in.,	" 60 "		154 20	
" 84 "	¾ in.,	" 70 "		58 80	
" 24 "	1 in.,	" 80 "		19 20	
" 1 stop-cock,	3 in ,	at $35 00		35 00	
" 51 "	4 in.,	" 45 00		2,295 00	
" 97 "	6 in.,	" 65 00		6,305 00	
" 2 "	8 in.,	" 80 00		160 00	
" 4 "	10 in.,	" 125 00		500 00	
" 5 "	12 in.,	" 135 00		675 00	
Amounts carried forward,				$11,702 80	$32,813 80

Cr.					
	Amounts brought forward,		$11,702 80	$32,813 80
By	4 stop-cocks, 23 in., at	$355 00	1,420 00	
"	2 " 30 in., "	425 00	850 00	
"	1 " 36 in., "	525 00	525 00	
"	143 fire-plugs, "	40 00	5,720 00	
"	222 " cases, "	20 00	4,440 00	
"	165 frames and covers, at	7 00	1,155 00	
"	492 stop-cock boxes, "	4 00	1,968 00	
"	Scrap iron and brass turnings sold,		410 00	
"	Patterns made and repairs,		500 00	
"	Repairs for First District,		583 52	
"	" " Second "		640 69	
"	" " Third "		600 00	
"	" " Fourth "		709 89	
"	" " West Philadelphia Works,		88 00	
"	" " Twenty-fourth Ward Reservoir,		162 62	
"	" " Fairmount Works,		95 00	
"	" " " Extension,		1,690 01	
"	" " Schuylkill Works,		234 90	
"	" " Delaware "		25 00	
"	" " Germantown "		302 18	
"	" " Roxborough "		200 60	
"	" " buildings and grounds,		179 95	
	Stock on Hand.			
"	4 sharp thread screws, at	$2 50	10 00	
"	8 square-top " 4 in., "	4 00	32 00	
"	5 " " 6 in., "	5 00	25 00	
"	2 " " 8 in., "	6 00	12 00	
"	6 " " 10 in. "	7 00	42 00	
"	2 " " 12 in., "	8 00	16 00	
"	6 " " 16 in., "	10 00	60 00	
"	8 " " 20 in., "	12 00	96 00	
	Amounts carried forward,		$34,496 16	$32,813 80

Cr.					
	Amounts brought forward,			$34,496 16	$32,813 80
By	10 six inch spindles,	at	$6 00	60 00	
"	27 four-inch "	"	5 50	148 50	
"	5 eight inch "	"	6 00	30 00	
"	11 twelve-inch "	"	8 00	88 00	
"	39 six inch socket screws,	at	5 00	195 00	
"	13 four-inch "	"	4 00	52 00	
"	2 sixteen-inch "	"	8 00	16 00	
"	2,870 lbs. bolts and washers,	"	16	462 20	
"	22,014 lbs. wrought iron,	"	4½	994 39	
"	600 " steel,	"	22	132 00	
"	46,450 " cast iron,	"	03	1,393 50	
"	1,357 " finished brasses,	at	60	814 20	
"	2,000 feet 5-4 white pine plank,			75 00	
"	1,000 " panel "			70 00	
"	983 lbs. brass castings, at 25 cts.,			245 75	
"	101 gallons of oil,			124 00	
"	138 wooden plugs, at 50 cts.,			69 00	
"	4 kegs nails,			28 00	
"	4 doz. hammer handles,			10 00	
"	7 " pick "			21 00	
"	1 " sledge "			3 00	
"	5 sides leather,			66 19	
	Balance, profit of shop,				6,780 09
				$39,593 89	$39,593 89

DISTRIBUTION.

Service mains have been laid in the following streets, in 1868.

First District.

Account of Iron Pipes laid in the First, Second, Third, Fourth and Twenty-sixth Wards.

Street.	Location.	Size. Inches.	Feet.
League,	From Twenty-second to Twenty-third,	4	460
Fernon,	" Eighth to Ninth,	4	400
Twenty-first,	" Catharine to Christian,	6	337
Twenty-second,	" Catharine to Christian,	6	286
Catharine,	" Twenty-first to Twenty-second,	6	460
Webster,	" " "	4	458
Reed,	" " "	6	365
Peter,	" 261 feet east of Twelfth,	4	307
South Marshall,	" Broad to Fifteenth,	4	332
Carpenter,	" Burnett to Gray's Ferry road,	6	154
Seventeenth,	" Federal to Reed,	6	1,063
Montrose,	" Nineteenth to Twentieth,	4	454
Sanderson,	" Fifteenth to Sixteenth,	4	468
Connecting Webster with Twenty-first,		4	24
" Wharton with Seventeenth,		6	31
Fitzwater,	281 feet west of Twenty-first,	6	281
Connecting Sixteenth with Reed,		6	33
Seventeenth, from Washington to Ellsworth,		6	350
Lowering pipe, Ninth and Tasker (relaid),		6	100
Federal, from Seventeenth to Twentieth,		6	1,375
Eighteenth, from Federal southward to Rutter,		6	414
Washington av., S. side, from Eleventh to Twelfth,		6	473
Anita, west from Twelfth,		3	230
Federal,	From Twenty-first to Twenty-third,	6	978
Connecting Federal with Twenty-third,		6	21
Plug connections,		4	216
	Total number of feet of pipe laid,		10,070

	Feet.
Number of feet of pipe relaid, 6-inch,	100
Number of feet of new pipe laid, 3-inch,	230
" " " 4	3,119
" " " 6	6,621
Total number of feet,	9,970

Or 1 mile 4,690 feet.

Second District.

Account of Iron Pipes laid in the Fifth, Sixth, Seventh, Eighth, Ninth, Tenth, Twenty-fourth and Twenty-seventh Wards.

Street.	Location.	Size. Inches.	Feet.
Story,	From Thirty-seventh to Thirty-eighth,	6	500
Thirty-seventh,	" Filbert to Centre,	6	257
Thirty-ninth,	" Ludlow to Market,	6	264
Thirty-fourth,	" Haverford road to Elm,	6	407
Powelton avenue,	" Fortieth to Forty-first,	6	912
Ludlow,	" Thirty-ninth to Fortieth,	4	628
"	" Thirty-fourth to Thirty-sixth,	4	787
"	" " "	6	5
Green,	241 feet east of Thirty-seventh,	6	241
Filbert,	300 feet west " "	6	300
Ranstead Pl.,	from Fourth to Fifth,	4	465
Hutton,	from Forty-first to Forty-second,	6	628
Walnut,	west from Darby road (relaid),	10	200
"	" " "	4	18
".	east of Fortieth, "	10	434
"	" " "	4	20
."	" Thirty-ninth, "	4	5
"	" " "	3	25
Lancaster Av.	above Forty-first, "	6	369
Thirty-fourth,	from Chestnut to Walnut,	6	396
Thirty-third,	" " "	6	271

Street.	Location.	Size. Inches.	Feet.
Thirty-third,	From Ludlow to Chestnut,	6	300
Lancaster Av.,	" Forty-fifth, west of Westminster avenue,	6	792
Sansom,	" Thirty-second to Thirty-third,	6	637
Thirty-fifth,	" Engine-house to Stand-pipe,	12	2,515
Descending main on Belmont avenue, to Twenty-fourth Ward Reservoir,		20	5,468
Plug connections,		4	166
	Total number of feet of pipe laid,		17,010
Number of feet of pipe relaid,	10-inch,		634
" "	6 "		369
" "	4 "		43
" "	3 "		25
	Total number of feet of pipe relaid,		1,071
Number of feet of new pipe laid,	20-inch,		5,468
" "	12 "		2,515
" "	6 "		5,910
" "	4 "		2,026
" "	3 "		20
	Total number of feet,		15,939

Or 3 miles 99 feet.

Third District.

Account of Iron Pipe laid in the Eleventh, Twelfth, Sixteenth, Seventeenth, Eighteenth, Nineteenth, Twenty-third and Twenty-fifth Wards.

Street.	Location.	Size. Inches.	Feet.
Day,	From Girard avenue to Thompson,	6	600
Sergeant,	" Cedar to Memphis,	4	420
Emlem,	" Trenton avenue to Cedar,	6	1,380
Lloyd,	" Sergeant to Huntingdon,	6	412

Street.	Location.	Size. Feet.	Inches.
Hackley,	From Fourth to Fifth,	6	600
Almond,	" Cumberland, 208 feet south of York,	6	940
Capewell,	" Belgrade to Gaul,	4	315
Leib,	" Columbia avenue to the south line of the estate of Lydia Harrison, deceased,	4	212
Monmouth,	" Salmon to Edgemont,	4	300
Brinton,	" Jefferson to Oxford,	6	540
Ash,	" William to Richmond,	4	1,200
Paul,	" Mill to Frankford road,	6	4,701
Richmond,	150 feet north of Erie avenue, to Bristol avenue, (relaid)	6	1,800
"	" " "	4	18
From bridge on Richmond street, 200 feet south,		4	200
Mascher,	From Montgomery to Columbia,	6	516
Martha,	" Huntingdon to Lehigh	6	900
Thompson,	" " "	6	816
Lehigh Av.,	" Germantown road to 154 feet west of Germantown road,	6	148
	" " "	12	12
Gaul,	" Otis to Norris,	6	218
Almond,	" " "	6	540
Mill,	" Paul to Frankford road,	6	400
Oakney,	" Norris to Diamond,	4	594
York,	" Sixth to Germantown road,	6	900
Connection,	" Marshall to York,	4	24
Ella,	" Emerald to Jasper,	4	450
New Third,	" Susquehanna to Norris,	6	1,200
Emlem,	" Cedar to Gaul,	6	480
Madison Av.,	" Frankford road to Emerald,	6	600
Lee,	" Huntingdon to Cumberland,	4	600
Columbia Av.,	" Fifth to Sixth,	6	504
Germant'n Rd.,	" York to Huntingdon,	6	1,560

Street.		Location.	Size. Inches.	Feet.
Connection,		Eighth and Germantown road,	6	36
"		York " "	6	36
Cumberland,	From	Front to Lee,	6	208
Plug connection,		at the mill of Keeler & Brownback, Sixth above Jefferson,	4	27
"	"	at Silk factory, America and Diamond,	4	9
Clearfield,	"	Gaul to Trenton avenue,	6	1,920
Connection,		Crown and Willow,	4	18
"		Frankf'd Rd. and Madison Av.,	8	12
Plug connections,			4	587
		Total number of feet of pipe laid,		26,953
Number of feet of pipe relaid,		6-inch,		1,800
"	"	4 "		18
		Total,		1,818
Number of feet of new pipe laid,		12-inch,		12
"	"	8 "		12
"	"	6 "		20,155
"	"	4 "		4,956
		Total number of feet,		25,135

Or 4 miles 4,015 feet.

Fourth District.

Account of Iron Pipes laid in the Thirteenth, Fourteenth, Fifteenth, Twentieth, Twenty-first and Twenty-eighth Wards.

Street.		Location.	Size. Inches.	Feet.
Callowhill,	From	Twenty-sixth to Wire Bridge,	6	385
Girard avenue,	"	Twenty-fifth to Thirty-first,	10	920
Opal,	"	Jefferson to Oxford,	6	542
Franklin,	"	Columbia to Montgomery Av.,	6	576

Street.	Location.	Size. Inches.	Feet.
Spring Garden Works,		6	48
" "		30	24
" "	pumping main,	12	156
Poplar,	between Twenty-second and Corinthian avenue,	30	360
Eighteenth,	From Columbia avenue to Berks,	6	960
Seventeenth,	" Master to Jefferson,	6	516
Hart,	" Tenth to Warnock,	4	250
Alder,	" Jefferson to Oxford,	6	552
Garnet,	" " "	6	564
Master,	" Thirty-first, westward 200 feet,	6	336
Ninth,	" Oxford to Columbia avenue,	6	576
Ingersoll,	" Seventeenth to Eighteenth,	6	468
Oxford,	" Eighth to Ninth,	6	360
Hubb,	" Twentieth to Twenty-first,	6	552
Dott,	" Hubb to Jefferson,	6	408
Wellington,	" Master to Jefferson,	6	528
Gratz,	" Oxford to Montgomery,	6	1,080
Jefferson,	" Suydenham to Wellington,	6	240
Eighteenth,	" Columbia to Montgomery (relaid),	6	650
Roxborough Works,		20	836
" "		23	12
Fairmount Works (pumping main),		36	203
" " " "		23	15

Manayunk.

Location.	Size. Inches.	Feet.
Ridge road,	16	1,284
Green lane,	12	2,676
Main street,	10	4,332
Green lane,	6	1,176
Plug connections,	4	259
Total number of feet of pipe laid,		21,844

	Feet.
Number of feet of pipe relaid, 6-inch,	650
Number of feet of new pipe laid, 36-inch,	203
" " 30 "	384
" " 23 "	27
" " 20 "	836
" " 16 "	1,284
" " 12 "	2,832
" " 10 "	5,252
" " 6 "	9,867
" " 4 "	509
Total number of feet of new pipe laid,	21,194

Or 4 miles 74 feet.

GERMANTOWN.

Account of Iron Pipes laid in Germantown, Twenty-second Ward.

Street.	Location.	Size. Inches.	Feet.
Woodbine,	From the present terminus of pipe, 150 feet south-westwardly,	3	286
School-house lane,	" from present terminus of pipe, about 500 feet westward	4	595
Washington lane,	east of Chestnut Hill R. R. (relaid),	3	527
Armat,	" Hancock (relaid),	4	140
"	west " "	4	146
Hancock,	south of Armat "	4	47
Venango,	west of Twenty-second (relaid),	6	230
"	east " "	6	489
"	" Township Line R'd (relaid),	6	245
Green,	at Coulter, "	4	42
"	south of Rittenhouse, "	6	346
School,	west of Green, "	4	489
Green,	north of Chelton avenue, "	6	300
"	" Rittenhouse, "	6	375
Shoemaker lane,	east of Germantown R. R., "	3	1,300

Street.	Location.	Size. Inches.	Feet
Locust Av.,	From Cedar to Chew,	4	1,042
Coulter,	" terminus of pipe to Knox,	4	494
Hancock,	" Armat to Chelton avenue,	4	410
Johnson,	" Nash to Musgrave,	4	850
Main to connect Roxborough Work with the Germantown Works,		20	3,000
Plug connections,		4	433
	Total number of feet of pipe laid,		1,686
Number of feet of pipe relaid,	6-inch,		1,985
"	" 4 "		764
"	" 3 "		1,827
	Total,		4,576
Number of feet of new pipe laid,	20-inch,		3,000
"	" 4 "		3,824
"	" 3 "		286
	Total number of feet,		7,110

Or 1 mile 1,830 feet.

Recapitulation of pipe laid in the several Districts during the year 1868.

WARDS.	3-inch.	4-inch.	6-inch.	8-inch.	10-inch.	12-inch.	16-inch.	20-inch.	23-inch.	30-inch.	36-inch.	TOTAL.
1st Dist., 1, 2. 3, 4, 26.....	230	3,119	6,621	.....	.....	.....	.....	.....	.....	.....	.....	9,970
2d Dist., 5, 6, 7, 8, 9, 10, 24, 27.....	20	2,026	5,910	.....	.....	2,515	.....	5,468	.....	.....	.....	15,939
3d Dist., 11, 12, 16, 17, 18, 19, 23, 25.....		4,956	20,155	12	.....	12	.....	.....	.....	.....	.....	25,135
4th Dist , 13, 14, 15, 20, 21, 28.....	.....	509	9,867	.....	5,252	2,832	1,284	836	27	384	203	21,194
Germantown, 22d.....	286	3,824	.....	.....	.....	.....	.....	3,000	.....	.....	.....	7,110
Total.....	536	14,434	42,553	12	5,252	5,359	1,284	9,304	27	384	203	79,348

Being a total of 14 miles 5,428 feet.

Total number of feet of pipe as per last report, - -	2,242,522
" " laid during the year, - -	79,348
Feet, - - - - - -	2,321,870

Or 439 miles 3950 feet.

SERVICE MAINS ORDERED.

Councils have ordered pipe laid in the following streets :

First District.

Pipe ordered to be laid in the First District.

Street.		Location.
Dean,		West of Twelfth, north from Wharton.
Morris,	From	Front to Otsego.
Dutton,	"	Morris to Mifflin.
Tenth,	"	Winton to Jackson.
Washington ave.,	"	Twenty-third to Twenty-fourth, N. side.
Moore,	"	Seventh to Ninth.
Taylor	"	Eighth to Ninth.
Twenty-sixth,	"	Park to Gray's Ferry road.
Twelfth,	"	Wharton to Passyunk road.
Price,	"	Seventh to Eighth.
Reed.	"	Eleventh to Thirteenth.
Moore,	"	Ninth to Broad.
Montrose,	"	Jessamine, west 170 feet.
Pierce,	"	Passyunk road to Thirteenth.
Twenty-third,	"	Shippen to Pemberton.
Ingerson,	"	Christian to Gray's Ferry road.
Wharton,	"	Sixteenth to Eighteenth.
Mount Holly,	"	300 feet south from Wharton.
Ingerson,	"	Burnett to Gray's Ferry road.
Eighteenth,		South from Federal.
Federal,	"	Seventeenth to Twenty-second.
Clarion,		South from Wharton.
Hoffman,	"	Ninth to Tenth.

Second District.

Pipe ordered to be laid in the Second District.

Street.	Location.
Thirty-seventh,	From Garden to Aspen.
	On a certain street running from Twenty-first to Twenty-second, south of Arch.
Thirty-seventh,	" Centre to Warren.
Story,	" Thirty-eighth to Thirty-ninth.
Thirty-fourth,	" Race to Lancaster avenue.
Somerset,	" Haverford to Mary.
Baltimore avenue,	" Forty-first to Forty-second.
Lancaster "	" Forty-fifth to Fifty-second.
Filbert street,	" Thirty-sixth to Thirty-seventh.
Thirty-eighth,	" Haverford road to Elm street.
Thirty-second,	" Chestnut to Walnut.
Arch,	" Thirty-second to Thirty-third.
Thirty-eighth,	" Market street to Lancaster avenue.
Silverton avenue,	" Brooklyn street eastward 175 feet.
Forty-second,	" Silverton avenue to Eadline st.
Warren,	" Thirty-third to Thirty-eighth.

Third District.

Pipe ordered to be laid in the Third District.

Street.	Location.
Toronto,	From Melvale street south 806 feet.
Tilton,	" Emery to Huntingdon.
Waterloo,	" Cumberland to Davis.
Anthracite,	" Salmon to Almond.
Berks,	" Front to Germantown road.
Newkirk,	" Cumberland to the line of the property owned by the Church of Messiah.

Street.	Location.
Ann,	From Emerald to Kensington street.
Huntingdon,	Between Kensington av. and Filmore av.
Wellington,	" Richmond to Cedar.
Columbia,	" Second to Howard.
Dickerson,	" Collins to Cedar.
Adams,	" Emerald to Kensington avenue.
Orthodox,	" Paul to Jefferson.
Tacony,	" Paul to Bridge.
Penn,	" Arrot to Oxford road.

Fourth District.

Pipe ordered to be laid in the Fourth District.

Street.	Location.
Thompson,	From William to Schuylkill Works.
Master,	" Twenty-seventh to Twenty-eighth.
Geary,	" Poplar to Wiley.
Lehigh avenue,	" Germantown avenue to Eleventh.
" "	" Suydenham to Eighteenth.
Bolton,	" Twenty-third to Twenty-fourth.
Jefferson,	" Sixteenth to Suydenham.
School-house lane,	" present terminus of pipe, about 500 feet westward.
Erdman,	north from Perkiomen.
Nineteenth,	" Jefferson to Oxford.
Mervine,	" Norris to Diamond.
Twenty-sixth,	" Brown to Poplar.
Tioga,	" Seventeenth to Twenty-second.
Main,	" Shur's lane to Green lane.
Bake,	" Green to Centre.
Centre,	" High to Hamilton.
Wood,	" Green lane to Cotton.

Street.	Location.
Penn,	From Main to Apple.
Apple to Cedar.	
Cedar to Main.	
Green lane,	" Main to Wood.
Levering,	" " "
Grape,	" " "
Gay,	" " "
Cotton,	" " "
Norris,	" Nineteenth to Twentieth.
Nineteenth,	" Norris to Berks.

GERMANTOWN.

Pipe ordered to be laid in Germantown, Twenty-second Ward.

Street.	Location.
Tioga,	From Seventeenth to Twenty-second.
Township-line road,	to connect with pipe now laid in the Twenty-eighth Ward.
Stenton av.,	From Terminus of pipe to Germantown avenue, thence south-eastwardly on Germantown avenue to Cayuga street, and eastwardly on Cayuga to Seventeenth.
Coulter,	" Present terminus of pipe to Wayne.

Account of the Number of Holes drilled for making New Attachments to Public Mains during the year 1868.

MONTHS.	½ inch diameter.	⅝ inch diameter.	¾ inch diameter.	1 inch diameter.	Total holes drilled and attachments made.	Shut off for repairs to private pipes.	Shut off for repairs to public pipes
January	86	5	4	4	49	25	18
February	10	1	1	1	13	20	9
March	130	22	5	8	160	85	7
April	230	31	10	4	275	69	20
May	252	34	9	2	297	42	18
June	247	28	9	4	283	30	19
July	270	21	5	6	302	28	10
August	297	28	12	5	342	32	13
September	286	41	2	4	333	40	10
October	272	32	4	2	310	35	16
November	296	50	9	3	358	45	23
December	187	28	8	3	226	37	23
Total	2,518	316	78	41	2,948	488	181

The above Attachments were made in the Wards as follow:

WARDS.	½ inch diameter.	⅝ inch diameter.	¾ inch diameter.	1 inch diameter.	Total holes drilled for attachments.	Shut off private pipes for repairs.	Shut off public pipes for repairs.
1st Dist., 1, 2, 3, 4, 26	529	49	10	5	593	57	.....
2d Dist., 5, 6, 7, 8, 9, 10, 24, 27	404	76	28	16	524	152	13
3d Dist., 11, 12, 16, 17, 18, 19, 23, 25	766	63	13	8	850	143	101
4th Dist., 13, 14, 15, 20, 21, 28	741	120	24	9	894	126	53
Germantown, 22d	73	8	8	3	87	10	14
Total	2,513	316	78	41	2,948	488	181

The following Table exhibits the Number of Repairs to Mains, Stops, Plugs, by different Districts, during the year 1868.

DISTRICTS.	Repairs to MAINS.	Repairs to STOPS.	Repairs to PLUGS.
First District.....	49	237	504
Second "	13	288	363
Third "	101	805	735
Fourth "	53	222	362
Germantown	14	6	46
Total	230	1,558	2,010

Account of New Stops and Fire-plugs for 1868.

DISTRICTS.	No. of Stops.	No. of Fire-plugs.
First District.....	18	9
Second "	17	16
Third "	71	72
Fourth "	33	24
Germantown	10	22
Total.....	149	143

PERMITS FOR THE YEAR 1868.

WARDS.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21 28	22	23	24 27	25	26	TOTAL.
Dwellings	209	34	6	5	3	8	49	39	41	11	2	.....	12	9	212	13	18	158	454	578	46	66	63	284	55	530	2905
" ½ and ¾	.....	4	.....	2	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	7	4	2	2	1	.....	.....	4	5	.....	4	.....	36
Baths	36	20	9	5	3	9	61	53	39	14	1	2	25	16	175	16	16	97	164	430	29	54	16	142	5	150	1587
" Public	.....	.....	.....	.....	.....	26	.....	.....	6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	.....	.....	.....	.....	34
Wash Paves	27	19	11	8	11	12	55	44	19	25	17	9	27	24	117	19	11	44	67	347	27	21	56	43	3	97	1160
Water Closets and Urinals	2	.....	2	1	27	55	74	92	50	29	5	14	36	13	77	5	5	6	5	176	20	29	.....	53	.....	16	792
Basins, Sinks and Tubs	.....	.....	2	.....	16	31	103	163	53	22	6	6	20	25	100	5	2	2	6	249	23	41	1	32	.....	5	913
Steam Engines	2	4	.....	1	4	3	1	1	4	1	2	3	1	.....	2	4	1	.....	8	4	.....	3	1	1	2	.....	53
Steam Ships	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Distilleries	4	9	.....	3	2	.....	3	.....	.....	2	1	.....	2	1	3	1	3	5	9	1	.....	.....	.....	1	40	2	92
Breweries	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	1	4	.....	.....	.....	.....	1	.....	8
Stables	3	4	1	3	1	1	7	9	5	6	.....	1	.....	1	9	2	4	3	11	16	.....	4	2	7	6	7	113
Churches and Schools	.....	.....	.....	.....	.....	.....	.....	.....	1	1	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	1	.....	.....	4
Rectifying Establishments	1	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3
Fountains	.....	.....	.....	.....	.....	1	.....	2	2	2	.....	.....	.....	2	.....	.....	.....	.....	1	1	.....	1	1	4	.....	1	18
Building purposes	15	5	1	1	1	1	7	8	9	6	.....	1	1	1	27	2	2	5	33	73	5	27	4	53	7	28	323
Stores and Shops	5	3	1	1	2	7	2	2	11	4	2	3	.....	.....	5	7	3	6	5	10	.....	4	.....	.....	2	3	88
Barber Shops	1	.....	.....	.....	.....	2	.....	2	4	.....	.....	.....	.....	3	1	.....	1	.....	2	1	.....	.....	1	1	.....	.....	19
Slaughter Houses	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	1	.....	.....	2
Hotels and Bars	2	2	.....	1	.....	3	.....	2	4	6	.....	2	1	.....	4	4	2	3	10	5	1	1	.....	4	3	7	67
Skating Parks	1	.....	.....	.....	.....	.....	1	.....	1	1	.....	.....	.....	.....	1	.....	.....	.....	1	2	.....	.....	.....	.....	.....	.....	8
Bakeries	1	1	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	1	5
Dye Houses	.....	.....	.....	1	.....	1	.....	.....	.....	.....	.....	.....	1	.....	1	.....	.....	1	2	1	.....	.....	.....	.....	.....	.....	8
Brick Yards	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4	3	.....	.....	.....	.....	.....	8
Soap Works	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Market Houses	.....	.....	.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2
Watering Streets	.....	.....	.....	.....	3	3	.....	3	.....	3	.....	.....	.....	1	.....	.....	.....	.....	.....	4	.....	1	3	.....	.....	.....	21
" Ships	8	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	9
" R. R. Horses	1	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2
Laundries	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	2
Green Houses	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	1
Factories	.....	.....	.....	.....	.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6	3	.....	2	.....	2	.....	.....	15
Marble Yards	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Sugar Houses	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1
Rolling Mills	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	1
Pottery	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	1
Total	320	105	36	34	75	165	365	421	249	134	36	42	126	97	741	83	70	335	787	1911	154	261	153	629	128	847	8304

RECEIPTS AND EXPENDITURES.

RECEIPTS.

The gross receipts for the year have been $777,009 59. The sources from which this amount has been received, will be exhibited by the statement of the Register, George F. Keyser, Esq. Of the above sum, $4,404 83 has been received at the Engineer's Office.

The following amounts have been received at the Chief Engineer's Office, and paid to the City Treasurer:

For rents, Saloon at Fairmount, &c.,	$1,575 00
" old iron and brass,	441 99
" stone,	479 92
" hay and wood,	76 00
Pennsylvania Railroad Co., for stop-cock, &c.,	76 00
Reading " "	66 00
U. S. Government, for goose-neck,	8 00
West Chester Railroad Co., for repairing fire-plug,	41 91
W. J. Horstman & Bro., for removing "	41 80
W. A. Porter, " "	48 88
J. P. Bruner & Sons, for 3-inch attachment,	46 21
U. S. Navy Yard, 4-inch attachment,	170 09
Penna. Horticultural Society, 4-inch attachment,	240 56
North Penna. Railroad Co., " "	119 22
U. S. Naval Asylum, " "	134 95
J. & W. Yewdell, " "	146 30
Twelfth Street Market Co., " "	338 56
W. Wood & Co., " "	148 85
Jno. Lawrence, " "	75 80
L. V. Tunison & Co., " "	128 79
Total,	$4,404 83

DEPARTMENT FOR SUPPLYING THE CITY WITH WATER,
Register's Office, No. 104 South Fifth Street,
PHILADELPHIA, *January*, 1869.

FREDERIC GRAFF, ESQ.,
Chief Engineer Water Department.

DEAR SIR:—I herewith submit to you the following statement of the operations of this office for the year 1868. Annexed you will find the schedule of the duplicates for the years 1868 and 1869, showing the aggregate amount of water rents charged upon the same and the increase thereof. Also the statement of permits taken out for various purposes, and the complete returns of all sources of revenue during the year, together with the total number of dwellings and steam engines, with their registered horse-power.

The estimated receipts at this office for the year 1868, was $700,000; you will see by reference to the tabular statement, that they amounted to $772,605 76; the increase in the item of water rents alone (notwithstanding the large number of declines and suspension of some branches of business), was $15,209 95; the total amount of rents in 1867 being $653,781 03, and in 1868, $668,990 98.

The amount due for iron pipe still outstanding, is $21,103 69, exclusive of the amount, $21,701 68, sent to the City Solicitor for lien, during the year.

Yours, very respectfully,

GEORGE F. KEYSER,
Register.

List of Consumers of Water in the several Wards, as charged in Registers of 1868.

WARDS.	¾ & 1½ dwellings.	Stables.	Manufactories.	Steam Engines & Boilers.	Horse Power.	
1	3,981	92	35	40	673	
2	5,189	106	38	21	384	
3	3,159	37	17	12	108	
4	3,375	51	10	7	60	
5	3,181	57	70	32	356	
6	3,435	31	56	32	910	
7	4,963	108	25	11	281	
8	3,357	208	24	13	175	
9	3,269	117	33	31	397	
10	3,801	108	38	18	320	
11	2,902	35	42	27	351	
12	2,774	43	26	15	157	
13	3,608	35	19	14	219	
14	4,261	57	34	27	687	
15	6,632	111	78	80	1,842	
16	3,321	83	99	53	864	
17	3,342	50	47	44	710	
18	4,163	69	50	45	862	
19	5,871	165	75	72	1,209	
20	8,037	172	46	44	581	
21 and 28	398	10	1	1	7	
22	838	124	19	20	285	
23	198	4	7	9	55	
24 and 27	2,418	61	26	11	299	
25	929	25	10	9	71	
26	5,692	103	34	22	470	
Total,	93,094	2,062	959	710	12,333	

Amount of Water Duplicates for the years 1868 and 1869.

Wards.	1868.	1869.
1st, - - -	$25,446 75	$27,191 75
2d, - - -	29,220 50	30,096 75
3d, - - -	17,048 50	17,392 00
4th, - - -	18,115 25	18,536 50
5th, - - -	28,334 50	28,568 00
6th, - - -	36,006 30	36,241 55
7th, - - -	34,064 50	34,933 00
8th, - - -	34,677 50	35,627 00
9th, - - -	29,489 00	30,276 75
10th, - - -	29,742 75	30,066 75
11th, - - -	18,555 00	18,713 75
12th, - - -	19,249 25	19,411 25
13th, - - -	27,197 50	27,437 50
14th, - - -	30,753 75	31,026 75
15th, - - -	60,046 75	62,200 50
16th, - - -	22,073 00	22,086 75
17th, - - -	20,115 75	20,591 00
18th, - - -	25,614 00	27,334 75
19th, - - -	39,192 00	43,793 60
20th, - - -	64,011 25	70,319 00
21st and 28th, -	4,253 50	4,402 50
22d, - - -	10,131 50	11,052 00
23d, - - -	1,261 00	1,939 50
24th and 27th, -	21,284 00	21,928 50
25th, - - -	5,355 25	5,849 00
26th, - - -	28,947 50	33,917 00
Total, - -	$680,186 55	$710,933 40

STATEMENT OF RECEIPTS AT REGISTER'S OFFICE, FROM JANUARY 1 TO DECEMBER 31, 1868.

MONTHS.	Delinquent Rents.	Penalties.	Rents, 1868.	Penalties.	Permits.	Pipe.	TOTAL.
January	$2,198 00	245 56	29,793 00	.....	2,586 75	10,995 02	45,818 33
February	435 75	49 03	77,252 75	.....	1,537 50	3,897 96	83,172 99
March	523 00	50 28	89,120 00	.....	4,506 75	4,224 77	98,424 80
April	1,247 75	150 44	332,141 55	.....	4,692 00	3,002 50	341,234 24
May	943 75	99 30	20,938 25	837 21	3,825 50	548 94	27,192 95
June	781 50	60 93	24,029 00	1,118 14	3,588 50	2,440 85	31,968 92
July	512 75	57 04	6,135 25	751 52	3,103 75	4,940 85	15,501 16
August	210 00	17 25	7,170 25	950 12	3,120 00	8,779 29	20,246 91
September	397 00	41 25	26,762 50	3,457 42	2,863 50	7,852 71	41,374 38
October	546 50	50 94	19,162 00	2,234 82	2,245 00	6,362 25	30,601 51
November	638 50	46 54	5,920 75	647 54	2,847 75	4,411 05	14,512 13
December	980 00	117 58	9,066 00	1,152 27	3,738 75	7,502 84	22,557 44
Total	$9,364 50	986 14	647,491 30	11,149 04	38,655 75	64,959 03	772,605 76

Expenditures of the Department for the year 1868.

Salaries of Chief Engineer, Register, Clerks, &c.,		$27,736 08
Office expenses,		7,216 35
Salaries of Engineers, Firemen, &c., at works,		26,857 97
Supplies to works, viz:		
Coal and wood,		30,335 54
Tallow, oil and gas,		3,025 18
Small stores, packing, &c.,		2,478 97
Repairs to works, viz:		
Fairmount Works,	$7,426 40	
Delaware "	2,743 40	
Schuylkill "	7,375 23	
Twenty-fourth Ward Works,	1,056 59	
Germantown "	745 54	
		19,347 16
Buildings, Grounds and Reservoirs:		
Lumber,	$2,138 20	
Carpenter work,	523 68	
Bricks,	364 00	
Plumbing,	223 52	
Hardware,	82 89	
Tin work,	580 52	
Painting,	166 00	
Paints,	176 82	
Bricklaying,	721 62	
Lining reservoirs,	1,145 32	
Measuring stone,	29 75	
Paper-hanging,	17 69	
Barrows,	36 25	
Plastering,	961 53	
Lime,	170 00	
Wages,	11,264 54	
Sundry bills,	104 97	
		18,707 30
Amount carried forward,		$135,704 55

Amount brought forward,		$135,704 55
Keeping grounds in order:		
Bricklaying,	$415 74	
Flowers,	19 05	
Scythes,	19 00	
Grass seeds,	7 80	
Lumber,	7 68	
Wages,	2,491 00	
Sundry bills,	21 86	
		2,982 13
Iron pipes, fire-plugs, and other fixtures and materials for laying pipe, &c.:		
Iron pipes,	$47,356 87	
Iron castings,	6,879 12	
Brass castings,	2,845 67	
Lead,	15,914 70	
Wrought iron and steel,	1,671 21	
Wood,	70 00	
Hardware,	1,344 71	
Coal,	558 75	
Bolts and nuts,	836 10	
Leather,	264 64	
Lumber,	1,725 43	
Gasket,	913 00	
Clay,	31 63	
Bricklaying,	82 55	
Rents of yards,	140 00	
Paints and oils,	565 91	
Machine work,	767 56	
Covering spindles,	330 00	
Belting,	45 78	
Stationary engine,	1,650 00	
Lathe,	816 67	
Hauling pipes,	426 62	
Amounts carried forward,	$85,236 92	$138,686 68

Amounts brought forward,	$85,236 92	$138,686 68
Inspecting mains,	392 83	
Towing,	98 00	
Powder,	63 22	
Coke,	23 54	
Sundry bills,	145 27	
		85,959 78
Labor, laying pipe, setting plugs, &c., and for fitting up stop-cocks, &c., &c., viz:		
Pipe, First District,	$2,361 90	
" Second "	2,856 35	
" Third "	6,865 42	
" Fourth "	3,853 54	
" Germantown,	2,572 89	
		18,510 10
Shop, viz:		
Wages,	$10,914 50	
Surveyors for measuring pipe,	1,847 86	
Hauling pipe, &c.,	507 85	
Pipe plans,	1,416 75	
		14,686 96
Keeping pipes, plugs, stops and fixtures in good order, viz:		
Wages, First District,	$4,119 95	
" Second "	4,266 38	
" Third "	6,914 12	
" Fourth "	4,454 24	
" Germantown,	898 25	
Paving around plugs,	1,421 70	
Plumbing,	39 45	
Sundry bills,	35 60	
		22,149 69
Amount carried forward,		$279,993 21

Amount brought forward, . . .		$279,993 21
Drilling and making new attachments, viz:		
Wages, First District, .	$1,413 00	
" Second " . .	1,413 88	
" Third " .	1,408 50	
" Fourth " . .	2,125 74	
" Germantown, .	127 00	
		6,488 12
Carriage hire, ...		115 00
For repairs and extensions to wharves at Fairmount and Schuylkill Works, &c., viz:		
Lumber, . . .	$3,555 68	
Wharf extensions, .	1,398 73	
Roofing, . . .	1,044 13	
Lime, ...	238 80	
Powder, . . .	226 50	
Rope, ...	61 18	
Towing, . . .	15 00	
Bricklaying, . . .	25 50	
Bricks, . . .	29 40	
Barrows, . .	36 00	
Hardware, . . .	69 15	
Wages, . .	8,245 57	
Sundry bills, . .	53 26	
		14,998 90
Geo. B. Roberts, for damages, . . .		170 00
Bills for overpaid and twice-paid water rents, &c., of 1864, 1865, 1866, 1867, and 1868, . .		172 95
Substituting turbine wheel at Fairmount, in place of old breast-wheels Nos. 2 and 3, viz:		
Turbine wheel (on account),	$32,702 87	
Mains, . . .	9,589 16	
Iron castings, . . .	684 38	
Amounts carried forward, .	$42,976 41	$301,938 18

Amounts brought forward,	$42,976 41	$301,938 18
Wrought iron beams and columns,	2,359 54	
Cement,	2,118 57	
Lime,	373 70	
Lumber,	840 81	
Coal for portable engine,	904 50	
Portable engine,	1,735 00	
Pump,	72 50	
Granite,	1,460 00	
Stone,	300 00	
Bricks,	400 00	
Bricklaying,	896 37	
Sand,	110 00	
Machine Work,	650 45	
Wrought iron and steel,	803 26	
Dressing tools,	377 52	
Powder,	150 60	
Bolts and nuts,	231 62	
Flag-stone,	107 80	
Scow,	175 00	
Roofing-felt,	60 00	
Towing,	19 00	
Paints, red lead, &c.,	40 99	
Hardware,	156 31	
Photographs,	72 00	
Rope,	109 79	
Packing, &c.,	72 98	
Skew Bricks,	63 00	
Hauling,	48 00	
Sundry bills,	286 21	
Wages,	28,239 90	
Pattern making,	222 66	
		86,434 49
		$388,372 67

EXTENSIONS OF WORKS.

AMOUNTS PAID FROM WATER LOANS.

Item 1.

For Cornish engine, boilers and connections:

Engine,	$1,623 95	
Lumber,	4 55	
Flag-stones,	112 77	
Wages,	3,871 21	
		$5,612 48

Item 3.

For pumping main:

Bricks,	$12 80	
Hauling,	12 00	
		24 80

Item 4.

For reservoir:

Check-valve,	$150 00	
Machine work,	672 80	
Lumber,	160 45	
Mains,	592 14	
Lime,	154 88	
Cement,	49 40	
Chain,	17 00	
Blacksmith's coal,	18 75	
Hauling,	57 50	
Wages,	4,581 68	
		6,454 60
Amount carried forward,		$12,091 88

Amount brought forward, . . .		$12,091 88

Item 5.

For twenty-inch, sixteen-inch and twelve-inch mains:

Wages, ...		69 00

Item 6.

For real estate:

Wages, ...		34 50

Item 7.

For incidentals:

Grindstone, . . .	$16 44	
Ropes, . . .	169 04	
Coal, . . .	105 11	
Packing, . . .	105 00	
Rent of lot, . . .	175 00	
Hardware, . . .	66 97	
Freight, . . .	51 99	
Stove and pipes, . .	125 18	
Coal Oil, . . .	98 46	
Machine waste, . .	23 20	
Photographs, . .	21 00	
Blacksmith's coal, . .	13 42	
Towing and tolls, . .	76 00	
Sundry bills, . .	272 77	
		1,319 58

Item 8.

For Cornish engine, boilers and connections, viz:

Engine (on account), .	$32,143 25	
Lumber, . . .	396 01	
Portable engine, . .	1,450 00	
Amounts carried forward,	$33,989 26	$13,514 96

Amounts brought forward,	$33,989 26	$13,514 96
Granite,	430 00	
Cement,	125 00	
Bricklaying,	452 80	
Coping-stone,	82 20	
Dressing tools,	91 17	
Tin work,	475 49	
Powder,	66 50	
Hardware,	44 96	
Sundry bills,	191 15	
Wages,	5,321 47	
		41,270 00

Item 9.

For engine-house foundations and stack:

Stone,	$2,639 13	
Bricks,	4,465 50	
Building blocks,	970 00	
Granite,	243 00	
Sand,	111 10	
Lime,	289 05	
Flag-stone,	260 70	
Bricklaying,	1,019 29	
Lumber,	832 74	
Sash,	120 00	
Portable engine,	1,045 00	
Towing,	188 50	
Wharfage,	37 50	
Paints,	103 31	
Hardware,	28 12	
Sundry bills,	6 15	
Wages,	8,628 98	
		20,988 07
Amount carried forward,		$75,773 03

Amount brought forward, . .		$75,773 03

Item 10.

For reservoir:		
Iron pipe, . . .	$231 30	
" castings, . .	122 52	
Dressing tools, . .	1,379 60	
Timber wheels, . .	30 00	
Watering cart, . .	115 00	
Powder, . . .	167 70	
Granite, . . .	2,607 00	
Stone, . . .	2,200 00	
Lumber, . . .	209 36	
Hardware, . .	67 29	
Sundry bills, . . .	72 24	
Wages, . .	57,263 66	
		64,465 67

Item 11.

For real estate:		
Real estate, . . .	$4,692 00	
Preparing titles, &c., .	250 00	
		4,942 00

Item 13.

For incidentals:		
Lumber, . . .	$135 00	
Derricks, . .	88 00	
Towing, . . .	87 00	
Tools, . . .	46 80	
Wages, . . .	250 00	
Sundry bills, . .	38 25	
		645 05
Amount carried forward, . .		$145,825 75

Amount brought forward, - - -		$145,825 75

Item 14.

For a thirty-inch main, to connect Corinthian Avenue Reservoir with the Kensington Water Works, viz:		
Lumber, - - -	$12 15	
Hauling, - - -	22 75	
Wages, - - -	$1,058 49	
		1,093 39
Purchase of the reservoir at Mount Airy, Twenty-second Ward, viz:		
Germantown Water Company, - -		16,085 33
Making and sinking a crib in front of Fairmount Dam, through the deep water, and placing an oak apron upon it, viz:		
Wages, - - - - -		1,624 11
For the purchase and laying mains, viz:		

Item 1.

For the purchase and laying a 16-inch, 12-inch and 10-inch main, for Manayunk:		
Mains, - - -	$14,821 47	
Hauling, - -	874 80	
Inspecting mains, - -	101 50	
Powder, - - -	81 50	
Sundry bills, - -	91 98	
Wages, - - -	6,063 72	
		22,034 97

Item 2.

For the purchase and laying a 20-inch main, to connect the Roxborough Water Works with the Germantown Water Works, viz:		
Main, - - -	$82,782 53	
Hauling mains, - -	1,977 00	
Amounts carried forward,	$84,759 53	$186,663 55

Amounts brought forward,	$84,759 53	$186,663 55
Inspecting mains, - -	374 00	
Powder, - -	131 94	
Dressing tools, - -	71 86	
Lumber, - -	26 49	
Sundry bills, - -	30 32	
Wages, - -	5,883 80	
		91,277 94

Item 3.

For the purchase and laying a 36-inch ascending main, from the Schuylkill Water Works to the Spring Garden Reservoir, viz:		
Mains, - - -	$37,454 16	
Inspecting mains, -	163 50	
Iron castings, - -	551 60	
Wages, - -	30 65	
		38,199 91

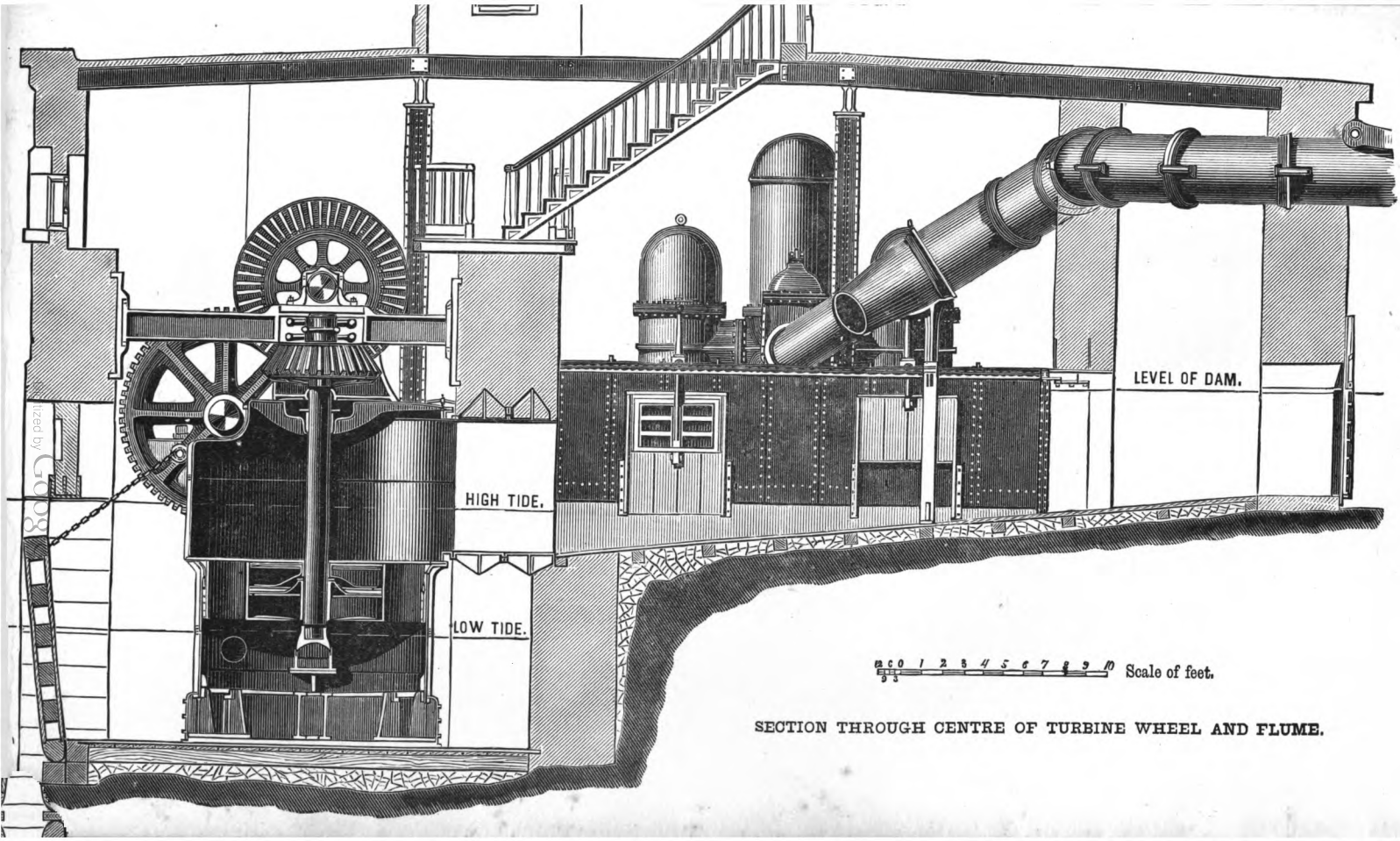
Item 4.

For the purchase and laying a 30-inch ascending and a 20-inch descending main for the Twenty-fourth Ward Water Works, viz:		
Mains, - - -	$72,906 67	
Iron castings, - -	163 00	
Hauling mains, - -	1,868 70	
Inspecting " - -	647 22	
Wharfage, - - -	57 65	
Lumber, - -	22 68	
Sundry bills, - -	12 07	
Wages, - -	3,940 26	
		79,618 25
Amount carried forward, - -		$395,759 65

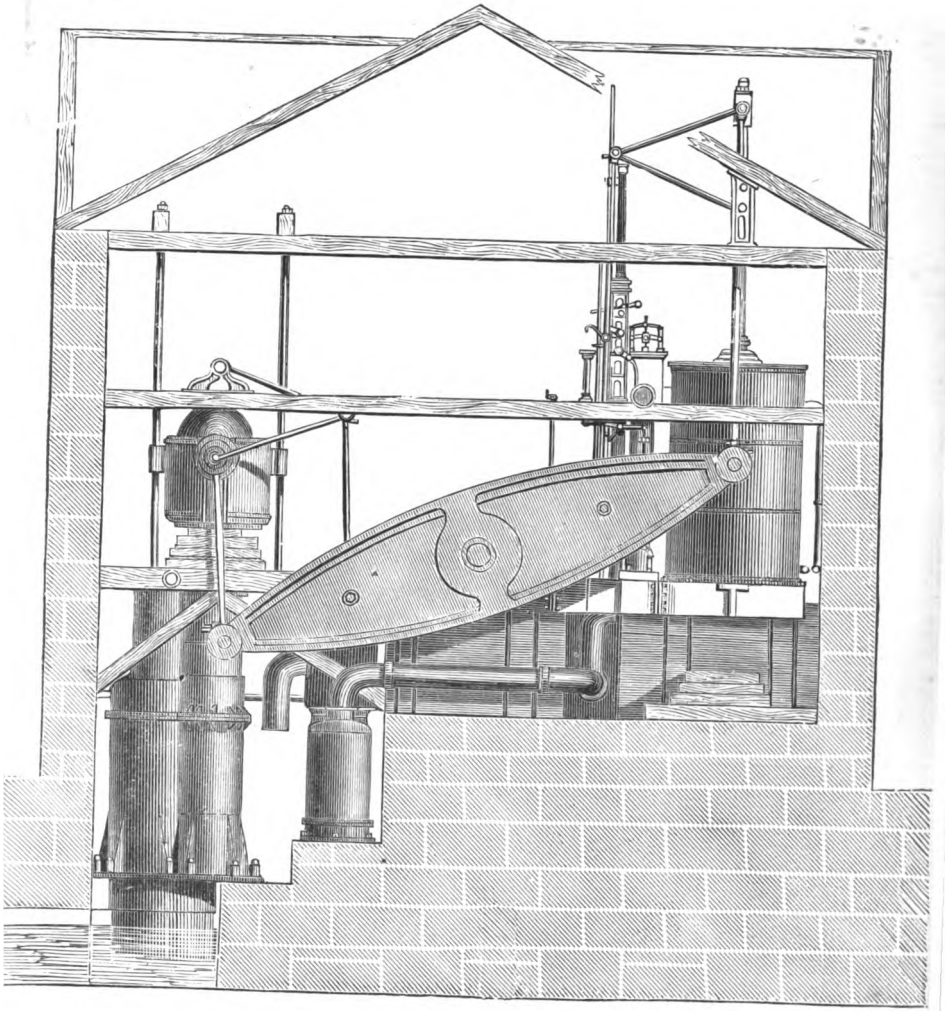
Amount brought forward, - - -		$395,759 65
For continuing the construction of the Twenty-fourth Ward Reservoir, viz:		
Mains, - - -	$1,589 01	
Stone, - - -	2,006 40	
Lime, - - -	348 70	
Gravel, - - -	81 60	
Powder, - - -	141 00	
Hauling, - - -	408 00	
Lumber, - - -	110 13	
Machine work, - -	34 75	
Rope, - - -	182 18	
Dressing tools, - -	591 70	
Sundry bills, - -	10 64	
Wages, - - -	3,921 22	
		9,425 33
For the purchase and location of a pumping-engine, to be used at the Schuylkill Water Works, to assist in keeping up the supply of water during the progress of extensions at Fairmount and Schuylkill Water Works, viz:		
Engine, - - -	$7,681 23	
Cast-iron pipe, - -	70 79	
Globe-valve, - - -	31 20	
Wrought iron pipe, -	94 73	
Packing, - - -	71 75	
Bricks, - -	34 00	
Bricklaying, - - -	138 62	
Hauling, - -	124 00	
Sundry bills, - - -	30 13	
Wages, - - -	383 36	
		8,659 81
		$413,844 79

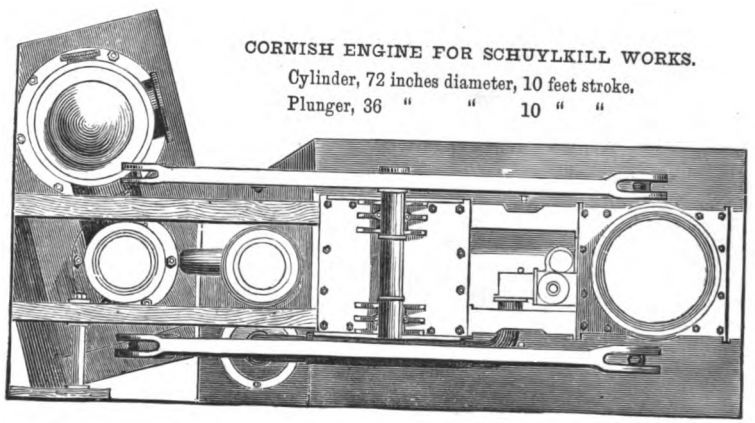
Length of Pipe laid since Consolidation.

YEARS.	MILES.	FEET.
1855	6	44
1856	10	2,079
1857	12	324
1858	13	3,484
1859	22	784
1860	19	224
1861	11	2,368
1862	9	954
1863	10	4,161
1864	6	4,287
1865	8	4,754
1866	12	2,964
1867	15	4,971
1868	15	148
Total, . .	173	5,146



SECTION THROUGH CENTRE OF TURBINE WHEEL AND FLUME.

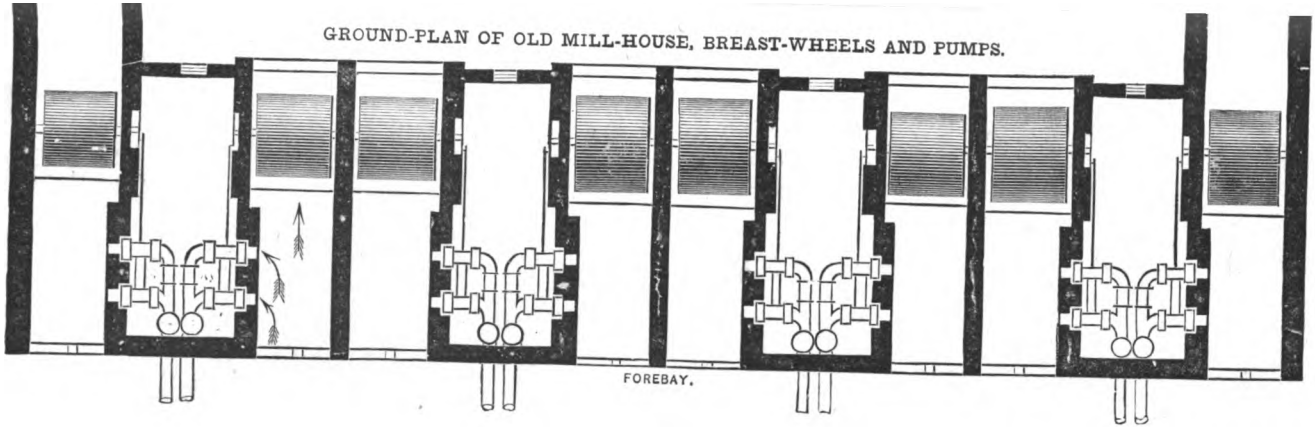




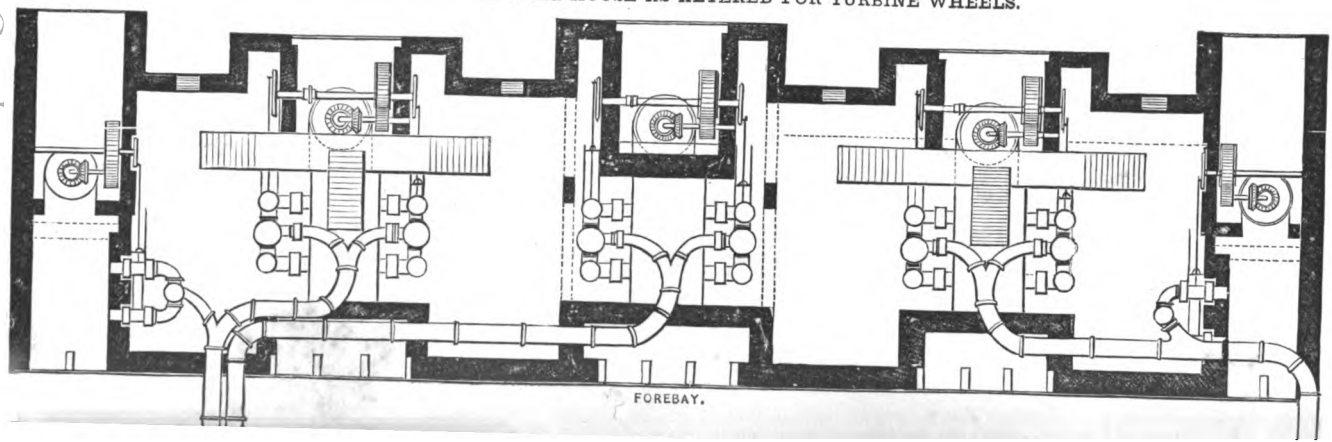
CORNISH ENGINE FOR SCHUYLKILL WORKS.

Cylinder, 72 inches diameter, 10 feet stroke.
Plunger, 36 " " 10 " "

GROUND-PLAN OF OLD MILL-HOUSE, BREAST-WHEELS AND PUMPS.



GROUND-PLAN OF MILL-HOUSE AS ALTERED FOR TURBINE WHEELS.



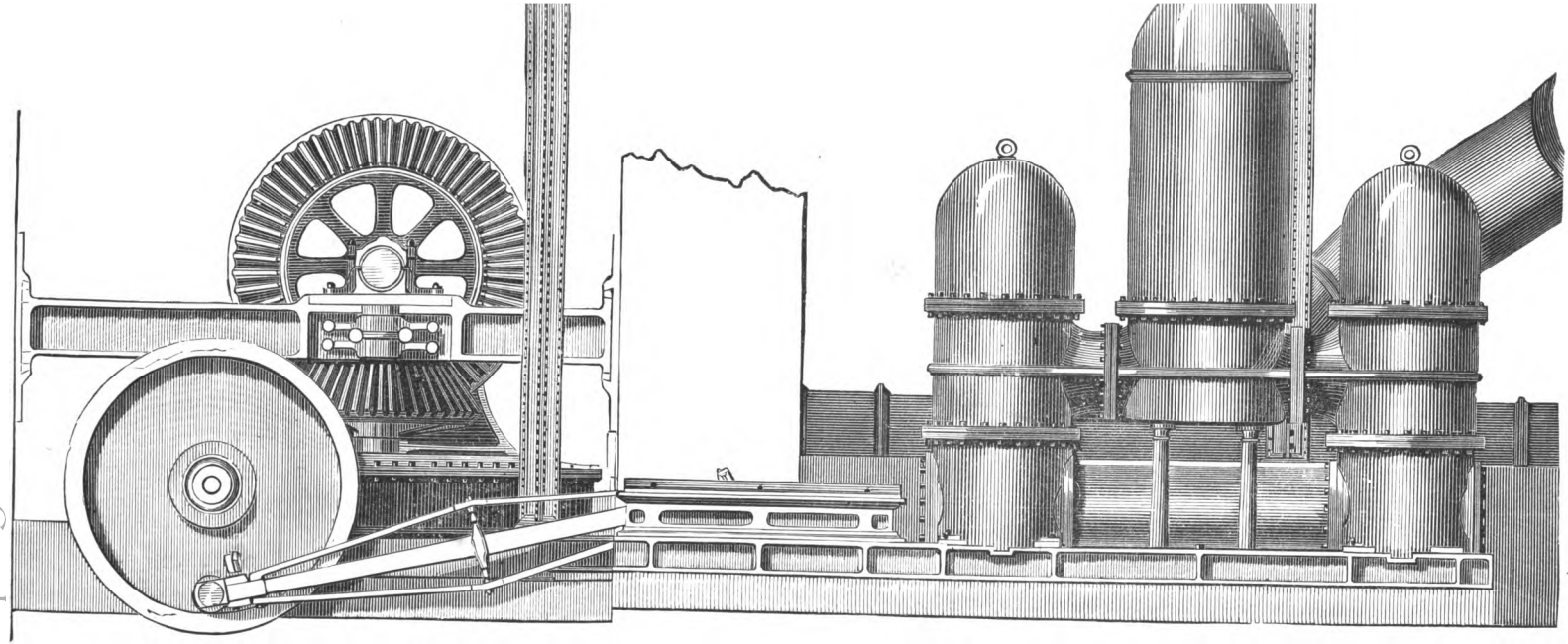
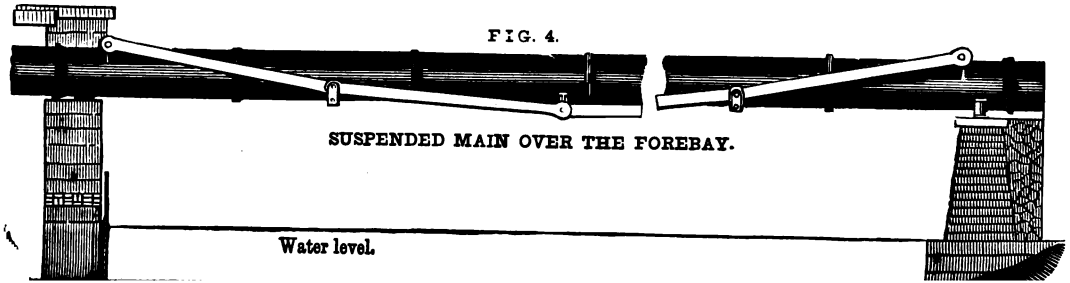


FIG. 4.



SUSPENDED MAIN OVER THE FOREBAY.

FIG. 6.

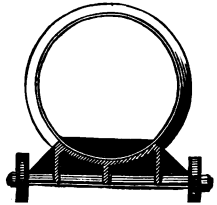


FIG. 5.

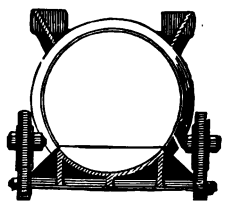
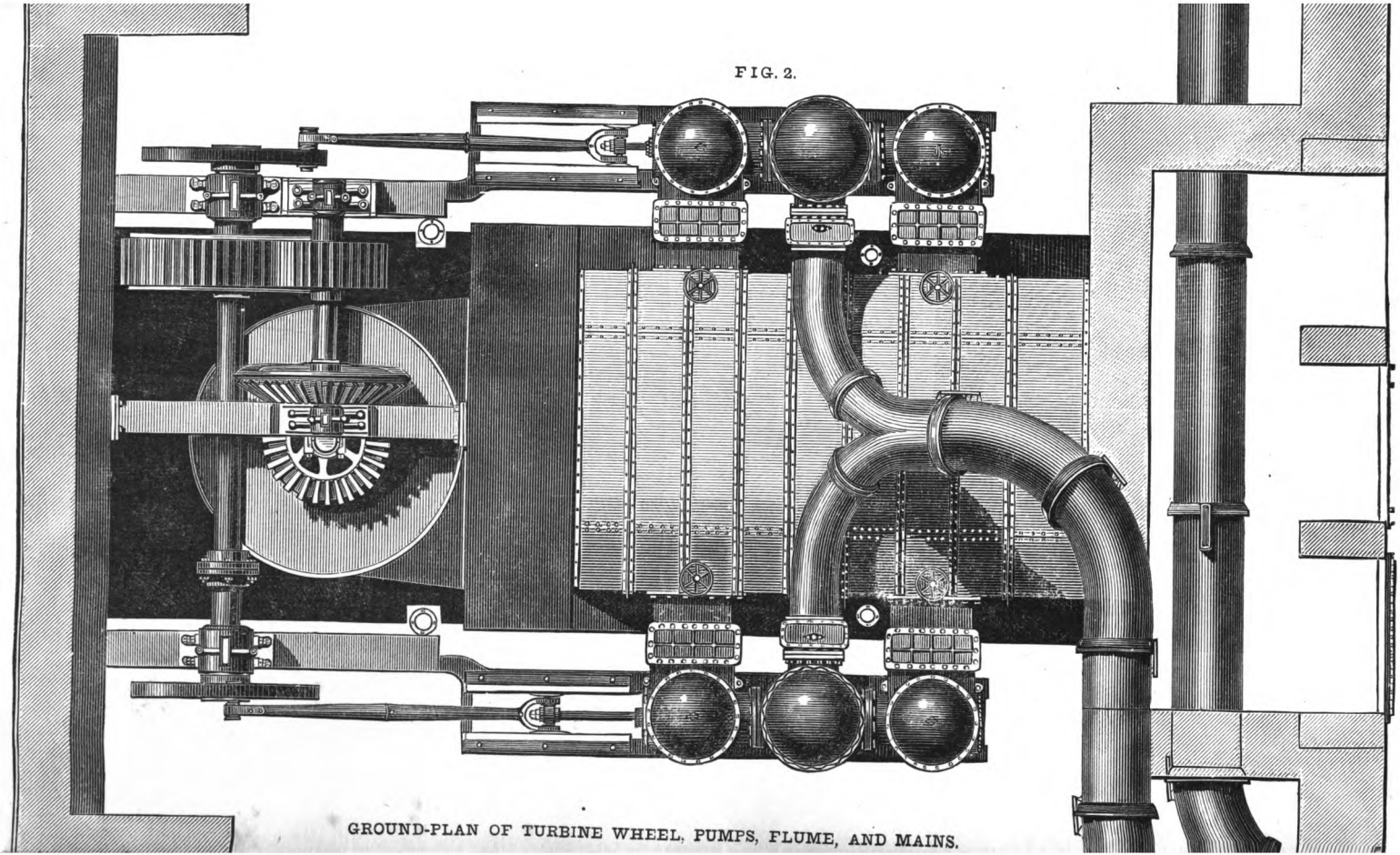


FIG. 2.



GROUND-PLAN OF TURBINE WHEEL, PUMPS, FLUME, AND MAINS.