FIRST ANNUAL REPORT

OF THE

SUPERINTENDENT

OF THE

JACKSON CITY WATER COMPANY,

OF THE

City of Jackson, Michigan.

To his Honor the Mayor, Recorder and Aldermen of the City:

GENTLEMEN—It affords me pleasure to comply with the request of the Jackson City Water Company to present you with a detailed statement of the cost of construction, the present condition and general workings of our system of water works, and I think I can safely say that, in all respects, they exceed the expectations of their most sanguine supporters.

The works have now (May 1st) been in operation for 8 months and 15 days, during which time the machinery has run incessantly, requiring comparatively very little expenditures for repairs, and is, in fact, in much better running condition than when accepted by the citizens' committee appointed for that purpose. This can safely be attributed to the proved superior excellence of its construction, and largely to the close attention given to it by the experienced and competent engineers who have it in charge. We have been very fortunate in this respect, as both the chief and his assistant—being practical workers in iron, and thoroughly conversant, in all respects, with such machinery—have been able to detect and repair at once any little derangement which otherwise might have caused serious loss.

It will not be necessary here to enter into a detailed statement of the cost of construction, &c., for annexed will be found tables showing definitely, everything pertaining thereto.

For the quantity of each size of pipe, and on what streets laid, see appendix, schedule A.

For the number and location of each hydrant, see schedule B.

In schedule C. is shown the number and location, and size of each stop gate.

For quantity of pipe and material on hand, with inventory of the effects of the Water Co., you will find in detail, in schedule D.

Schedule E. gives a list of the different establishments using water.

You will also find annexed a detailed abstract of the whole cost of the works up to May 1st.

For the net expenses of running the works from August, 15th 1870, to May 1st, 1871, 8½ months—see "Recapitulation of running expense."

And for the work done by the engine, the number of revolutions made—the quantity of water pumped—duration of fires—water pressure &c., I refer you to "engine record."—Also treasurer's report annexed.

On the opening of Spring, we found the pipes and hydrants all sound and in perfect working order—not requiring an expenditure of ten dollars for repairs.

When starting the works, economy in fuel was an early consideration, as this is usually a large item of expense. We experimented with Ohio coal, costing $6.50 per ton, with coal from mines in this locality, costing $5.50, $4 and $2.50 respectively, and found that more tons of the best coals were burned to produce the same results, than of the cheapest. Therefore none except the coal at $2.50 per ton has been used since the experiment was tried. There are kept on hand a few tons of Ohio coals for the upright boiler when found necessary to use it.

Allow a word upon the quality of water. We fail to understand why our river water taken directly into the pipes, from only a few miles from the springs which supply it, and passing through a gravel filter six feet in thickness, should be inferior to the Croton or Cochituate, which are brought from 20 to 30 miles in the river bed, and collected in large open reservoirs, the acknowledged receptacles of all kinds of filth. Surely we need have no fear of lizards and other creeping things in our water pipes, as is the case under the old reservoir system. There is no doubt that the water delivered from the pipes is much better than from any well in the city that has been used for five years or more.

Our city, during the past winter has been remarkably exempt from fires. We have had enough, however, to thoroughly test the efficiency of this system of fire protection. How far this tends to deter incendiaries from doing their work, is a question for thought. It is safe to affirm that with the proper management of the hose by our wide-awake hose companies, a fire will rarely, if ever, extend beyond the building in which it originates. For the number of fires, their duration, fire pressure, &c., see "engine record."

You will perceive in the "engine record" that the velocity of the engine is increased as the demand for water increases. I would consider it advisable, without much delay, to procure a set of gang pumps to be used for ordinary supply, thereby saving the rotary pumps for fire purposes. This would ultimately result in a great saving to the city.

As it is difficult and next to impossible to approximate very nearly to the quantity of water delivered, where much is required, I would recommend the use of water meters, which would materially increase the revenue, and also prevent so great waste of water. A pair of scales is needed at the works for reweighing the coal when delivered. Also a different whistle upon the engine building, which would give no uncertain sound, in case of fire.

I have taken the liberty, gentlemen, to make these suggestions, feeling and knowing their importance, and thinking perhaps that few, if any, not familiar with the works, would realize their necessity.

Thanking you for your kind attention while hearing this, of necessity, lengthy report, I will take this opportunity to express my sincere thanks to the members of this Council, and to all the members of the Jackson City Water Company, for their uniform courtesy and indulgence. Respectfully submitted.

W. M. BENNETT,
Sup't Jackson City Waterworks.

APPENDIX TO REPORT.

SCHEDULE A.

Pipe of all sizes now laid, and where laid, for the distribution of water.

FIFTEEN INCH.

307 feet from engine building to Water street.

TWELVE INCH.

949 feet from Water street to Washington.

EIGHT INCH.

990 feet on Mill from Washington to Main.
2,589 feet on Main street from Mill to North Main.

3,579 feet of eight inch.

SIX INCH.

2,899 feet on Main from N Main to W avenue.
678 feet on Blackstone from Main to Washington.
3,627 feet on Milwaukee from Mill to Ganson.
276 feet on Ganson from Milwaukee to Cooper.
680 feet on Cooper from Ganson to Prison.
609 feet on Prison from Cooper to Mechanic.
290 feet in prison yard.
2,715 feet on Washington from Mill to Blackstone.

11,769 feet of six inch.

FOUR INCH.

192 feet on engine lot to supply hydrants.
72 feet on Mill to supply hydrants.
451 feet on Main to supply hydrants.
3,887 feet on Mechanic from Main to Prison.
706 feet on Jackson from Main to Clinton.
1,880 feet on Blackstone from Main to Trail.
2,096 feet on N. Main from Main.
2,071 feet on E. Main from Milwaukee to E. Avenue.
126 feet on Milwaukee to supply hydrants.
19 feet on Ganson to supply hydrants.
28 feet in Prison to supply hydrants.
170 feet in prison yard.
68 feet on Washington to supply hydrants.
267 feet on Franklin to west side M. S. R. R.
1,903 feet on Washington from Blackstone to Fourth.
671 feet on Fourth from Washington to Main.
3,152 feet on Franklin from M. S. R. R. to Blackstone.
862 feet on Blackstone from Franklin to Washington.
2,130 feet on Francis from Franklin to Mitchell.
1,301 feet on Wilkins from Francis to Jackson.
617 feet on Jackson from Wilkins to Franklin.

22,059 feet of four inch.

RECAPITULATION OF PIPE LAID.

Diameter in inches.	No. of feet.
15	307
12	949
8	3,579
6	11,769
4	22,059

Total, 38,663 feet.
or 7 miles 1,703, feet.

SCHEDULE B.

Number and Location of Fire Hydrants now in use.

No.	Street.	Location.	Side.
1	Engine lot	W side of engine building	
1	Mill	Near Wesley	West
1	"	S W corner of Cortland	
1	"	S E corner of Main	
1	Main	Alley at Hurd House	North
1	"	Alley at P. Morrison's	"
1	"	Alley at Marion House	"
1	"	Alley at Webster's block	South
1	"	Alley at Emmons's	"
1	"	Alley at Reynolds' old block	
1	"	N E corner of Mechanic	
1	"	S W " Jackson	
2	"	Front of Turner's block	North
1	"	S W corner of Blackstone	
1	"	S E " N Main	
1	"	S W " Second	
1	"	S W Fourth	
1	"	Near P. Livermore's resdnc.	North
1	"	N E corner W avenue	
1	N Main	Opposite Lydia street	North
1	"	Near E. Webster's	
1	E Main	S E corner of Van Dorn	
1	"	N W " State	
1	"	N W " East Avenue	
1	Milwaukee	N W " Liberty	
1	"	N W " Main	
1	"	N W " Detroit	
1	"	S E " Hamlin	
1	"	N E " Quarry	
1	Ganson	N E " Cooper	
2		In Prison Yard	
1	Mechanic	N E corner of Prison	
1	"	Between Ganson and Trail	West
1	"	N W corner of Trail	
1	"	Near Adams' Lumber Yard	West
1	Jackson	S E corner of Clinton	
1	Blackst'ne	N E " Luther	
1	"	N E " Van Buren	
1	"	N E " Trail	
1	Mechanic	N W " Clinton	
1	Wash'nt'n.	N E " Francis	
1	"	N W " Mechanic	
1	"	S W " Jackson	
1	"	N W " Blackstone	
1	"	N E " First	
1	"	N W " Second	
1	"	N E " Third	
1	"	N E " Fourth	
1	Franklin	S W " Milwaukee	
1	"	S W " Francis	
1	"	N W " Mechanic	
1	"	S W " Jackson	
1	"	N E " Blackstone	
1	Francis	S E " Wilkins	
1	"	N W " Morrill	
1	"	N E " Mitchell	
1	Wilkins	N E " Mechanic	
1	"	S W " Jackson	
1	Blackst'ne	N E " Wesley	
60 total			

SCHEDULE C.

Number and locaton of Stop Gates.

No.	Size in inches.	Street.	Location.
1	12	Water	West side.
1	8	Main	Centre Main and Main.
1	8	"	Junction Main and N. Main.
1	6	Milwaukee	" Mill.
1	6	Prison	front of Prison gate.
1	6	"	on pipe leading into Prison.
1	6	Mill	Junction Washington.
1	6	Main	" Blackstone.
1	6	Wash'gton	" "
1	4	Engine lot	For hydrant.
1	4	Water	near Engine lot.
1	4	Milwaukee	Junction E Main.
1	4	Main	" Mechanic.
1	4	"	For hydrant at Hurd House.
1	4	"	" " P. Morrison's.
1	4	"	" " Marion House
1	4	"	" " Emmons block
1	4	"	" " Webster
1	4	"	" " Reynold's old "
1	4	"	" S W corner of Jackson
1	4	"	" front of Turner block
1	4	"	" S W corner Blackstone
1	4	"	Junction of Jackson
1	4	"	" Fourth
1	4	Wash'gton	" Blackstone
1	4	Main	" N Blackstone

RECAPITULATION

Of size and number of Stop Gates.

Interior diameter. Inches.	Number.
4	17
6	6
8	2
12	1
Total	26

SCHEDULE D.

Inventory of property in Engine building, and pipe, &c., not used.

PIPE AND OTHER CASTINGS.

FOUR INCH.

2,652 feet common joint.
8,184 feet Patent joint

10,836 feet four inch.

SIX INCH.

60 feet common joint
2,028 feet Patent joint

2,088 feet six inch.

RECAPITULATION.

4 inch	10,836
6 inch	2,088
Total,	12,924 feet, or 2 miles 2,264 feet.

ODD CASTINGS.

2 8 and 4 inch tees
1 6 and 6 " "
25 4 and 4 " "
1 6 and 6 " cross
5 6 and 4 " "
5 4 and 4 " "
3 15 inch sleeves
3 12 " "
2 8 " "
5 6 " "
5 4 " "
6 6 " caps
3 4 " stop gates
1 6 " " "
4 Gate covers
15 Hydrants

IN ENGINE BUILDING AND COAL HOUSE.

1 Arch frame double cylinder and variable cut off piston engine, with cylinders 16 inches in in diameter and 27 inches long
1 Holly's patent elliptical rotary steam engine, of one hundred and fifty horse power
2 Holly's patent rotary pumps, with capacity of three million gallons in twenty-four hours
1 Holly's patent pressure guage
1 Donkey engine
1 Boiler feed pump
1 Rotary blower
1 Horizontal boiler
1 Upright boiler
1 Water safety valve
Also all necessary gearing, shafting, steam pipes, steam, water and vacuum guages, and all valves, &c., needed in connection with said machinery
10 Galls machine oil
1 Barrel lard oil, No. 1
30 Galls kerosene oil
¾ Cord basswood kindlings
24 lbs rubber packing
6 Tons Ohio coal
2 Tallow cans
2 Oil cans
9 Open wrenches
2 Screw do.
2 Yankee do.
1 Oil Drainer
1 Socket wrench
1 40-gall. oil can
2 Hoes
1 Steel scoop shovel
2 Fire pokers
1 Steam blower
1 Flue scraper
1 Coal car
1 Work bench and vice
1 Grindstone and frame
4 Kerosene lamps
8 Settees
70 Feet 1¼ inch rubber hose and pipe
1 Wheelbarrow
22 ¾ inch ferrules
14 1 inch "
2 ½ inch "
2 Rachets and drills
1 Saw
3 Files

SCHEDULE E.

Table of establishments using water to May 1, 1871.

65 Dwellings
4 Saloons
2 Meat markets
1 Carpenter shop
2 Hotel stables
4 Drug stores
2 Printing offices.
2 Barns
1 Farming tool manufactory
1 Bakery
1 Foundry and Machine shop
1 Livery stable
Jackson, Lansing and Saginaw Railroad
Michigan Central Railroad
3 Groceries
1 Planing mill
2 Flouring mills
1 Church.
5 Dry goods stores
2 Eating houses
1 Daguerrean rooms
1 Barber shop.
1 Bath room (public)
1 Liquor house
1 Fish market
3 for building purposes
2 Book stores
1 Hardware store
1 Jewelry store
2 Boarding houses
1 Dentist office
1 Boot and Shoe manufactory
1 Sprinkling cart.
1 Furniture manufactory
1 Pottery
1 Carriage shop
1 Crockery store
1 Vinegar manufactory
1 Club room
1 School room
1 Hotel.
1 State Prison

128 Total.

DETAILED ABSTRACT

Of the cost of construction of the Jackson city Water Works to May 1st, 1871.

REAL ESTATE.

For 4 lots of land	$2,000 00	
" grading same	727 22	
Total real estate		$2,727 22

ENGINE BUILDING AND COAL HOUSE.

For mason work, per contract	$5,960 00	
" carpenter work, " "	4,850 00	
" foundation for machinery	246 09	
" sundry wood work	79 28	
" flagging floor in boiler room	103 40	
" sundry mason work	123 80	
" iron work on roof	102 00	
" lumber and build'g coal house	256 48	
" laying walk, &c	17 42	
Total for buildings		11,738 42

MACHINERY, &c.

For engines, boilers, &c., per contract	40,000 00	
For painting engine	100 00	
" sheet brass, drip pans, &c	59 87	
" grindstones, oil cans	28 69	
" rubber hose, pipe, &c	35 25	
" work-bench, vise, &c	26 30	
" wrenches, bolts and iron pipe	74 29	
" rachets and drills for tapping	108 85	
" settees, &c	21 69	
" lamps and fixtures	5 85	
" [illegible] and castings	[illegible]	
Total machinery		40,481 54

RESERVOIR, FILTER, PUMPING WELL, &c.

For laborers	599 94	
" lumber for coffer dam	195 17	
" hand pumps	21 70	
" rent of engine and wood	78 92	
" 20-inch tile from river to well	148 58	
" mason work, stone, water-lime	1,428 08	
" stop gates, strainer, hoisting apparatus, &c	344 18	
" rope	3 60	
" iron bolts and nails for coffer dam	44 35	
" gravel and sand for filter	49 13	
" kettles for pumping well	13 00	
Total reservoirs, &c		2,926 05

PIPES, HYDRANTS, &c.

For iron pipe	45,972 19	
" suction and discharge pipe	344 33	
" on pipe freight	5,192 90	
" hauling pipe	86 10	
" laying pipe	3,861 16	
" Plank for ditches	5 98	
" coal for melting lead	25 10	
" iron plugs	173 25	
" Laborers, for ditching and filling	6,460 86	
" picks	46 50	
" sharpening picks	95 52	
" re-laying pavement	346 82	
" hydrants	3,760 00	
" stop valves	862 40	
" freight on valves and hydrants	96 30	
" valve covers	142 50	
" valve boxes	98 58	
" hydrant and valve wrenches	81 75	
" hydrant stakes	8 98	
" pig lead, oakum, and freight	2,017 82	
" drayage, express, &c	43 00	
" traveling expenses	116 60	
" Putting in boxes	2 50	
" telegraph dispatches and stamps	13 33	
	69,740 49	
Less pipes &c. sold prison 685 93; " scraps sold foundry 576 03 —	1,261 96	
Total pipe service		68,478 53

PUMPING SERVICE.

For wages chief engineer	856 50	
" wages assistant engineer	637 50	
" coal	1,561 90	
" oil and kerosene	219 90	
" wiping rags	38 05	
" setting glass	6 75	
" kindling wood	5 00	
" steam packing	28 13	
" ice	3 00	
" repairing furnace	5 00	
" machinery repairs	19 30	
" wood	9 00	
" repairing pipes	38 15	
" repairing hydrants	9 70	
" draying and splitting wood	2 25	
" lumber for drain	5 47	
" patent steam tap	15 00	
" work on machinery, repairs, addition, &c	48 80	
Total pumping service		3,511 40

EXPENSE ACCOUNT.

For stationery, books, &c	42 20	
" printing	53 50	
" interest on bonds	24 11	
" Lusk's services on trial	20 00	
" Posting bills	3 00	
" expenses selling bonds	250 00	
" express charges	10 00	
" salaries, Water-works Co. &c	779 30	
" " Treasurer	650 00	
" " Superintendent	1,178 23	
" revenue stamps	21 45	
" expenses to Lockport	30 00	
" blank orders	3 00	
Total expenses		3,035 29

CORPORATION FERRULES.

For ⅝, ¾ and 1 inch ferrules	289 67	
Less sold	122 00	
		167 67
Total expenditures		$133,096 12

RECAPITULATION OF EXPENDITURES.

Real estate	2,727 22
Engine building and coal house	11,738 42
Machinery and fixtures	40,481 54
Reservoir, pumping well, filter, &c	2,906 05
Pipes, hydrants, valves, &c	67,478 53
Pumping service	3,511 40
Expense	3,065 29
Corporation ferrules	167 67
Total expenditures of construction and running, including material on hand	$133,096 12

RECAPITULATION

Of Running Expenses of Works, 8 months 15 days.

For wages, chief engineer		850 00
" " assistant engineer		637 50
" " superintendent		708 30
" " treasurer		425 00
" coal		1,529 70
" stores for use of pumping house	422 33	
Less amount on hand	84 48	
		337 85
Total net running expences of the works, for 8½ months		$4,488 35

ENGINE RECORD,

From August 15th, 1870, to May 1st, 1871.

Months of the year.	Number of Pumping days.	Pumping time per month. Hours.	Revolutions per Month.	Revolutions per minute.	Quantity of water pumped each month. Gallons.	Ordinary pressure. Pounds per in.	Coal consumed per month. Pounds.	Fire pressure. Pounds per in.	Duration of fire pressure. H. M.	Steam pressure. Pounds per in.	Average vacuum. Pounds per in.
August	16	444	256,400	10	2,327,332	35	53,480			25	22
September	30	720	432,000	10	6,760,000	50	112,270	80	0.30	35	22
October	31	744	535,680	12	7,142,400	40	118,480			40	24
November	30	720	604,800	14	8,064,000	45	110,200	95	3.15	45	25
December	31	744	803,520	18	10,800,398	45	113,630			50	26
January	31	744	803,520	18	10,350,398	45	127,380			50	26
February	28	672	806,400	20	11,952,000	45	114,660			50	25
March	31	744	1,071,360	24	14,284,800	45	130,666	75	1.10	50	26
April	30	720	1,296,000	30	17,280,000	45	90,770	70	0.40	50	26
Total	258	6,252	6,619,680		87,411,328		972,036		5.35		

TRIAL BALANCE,

Jackson City Water Co., April 30 1871.

Real estate	$ 2,729 22
Building	11,738 42
Reservoir	2,926 05
Engine and machinery	40,481 51
Pipe	68,478 53
Service cocks	167 67
Expense	3,065 29
Pumping Service	3,511 40
	$133,096 12
City of Jackson stock account	$ 99,750 00
G. M. Lathrop "	50 00
J. C. Bonnell "	50 00
T. G. Bennett "	50 00
E. Pringle "	50 00
C. H. Bennett "	50 00
City of Jackson, Interest	77 36
Bills payable (Gayland & Co.)	15,630 92
Exchange	25 00
Interest	552 47
First National Bank	3,890 56
H. Phelps	1,022 23
Water receipts	129 81
Wm. Smith	5,321 14
Jackson Foundry & Machine Co.	62 58
J. F. Coats	209 92
Holly Manufacturing Co.	1,259 25
Brown & Co.	190 80
Rice, Pratt & Co.	48 80
A. B. Hinman & Co.	46 00
Mansfield & Fitzsimmons	51 50
Carlton & Van Antwerp	53 50
G. F. Hinchman & Co.	20 33
W. M. Bennett	736 81
Woodville Coal Co.	1,384 28
J. L. Holmes	2,000 00
W. H. Avery	37 50
H. A. Stetson	50 00
G. H. Lathrop	164 80
C. H. Bennett	25 00
E. Pringle	50 00
	$133,096 12

JNO. C. BONNELL,
Treasurer J. C. W. Co.