City Document.—No. 69.

CITY OF BOSTON.

MAJORITY AND MINORITY

REPORTS

OF THE

JOINT SPECIAL COMMITTEE

ON THE SUBJECT OF THE

STEAM FIRE ENGINE

MILES GREENWOOD.

1857.

In Committee, Oct. 27, 1857.

Voted, That the Committee report in print, with the approval of the Committee on Printing.

SILAS PEIRCE, *Chairman.*

Approved by the Committee on Printing.

OSMYN BREWSTER, *Chairman.*

CITY OF BOSTON.

In Board of Aldermen, July 20th, 1857.

Whereas, it appears that the steam fire engine Miles Greenwood has, for some cause, failed to answer the expectations entertained of its usefulness here; and whereas, it also appears that steam power has been successfully applied elsewhere as auxiliary to the Fire Department; therefore, without expressing any doubt as to the practicability eventually of such application of it here, it is

Ordered, That the Chief Engineer be and he hereby is instructed to discharge the engineer and company attached to the Miles Greenwood steam fire engine, and that the Committee on the Fire Department have full power to dispose of the said engine, at public or private sale.

Read twice and passed. Sent down for concurrence.

PELHAM BONNEY, *Chairman.*

CITY OF BOSTON.

In Common Council, July 23, 1857.

Ordered, That the order relative to the steam fire engine Miles Greenwood, be referred to Messrs. J. B. Richardson, McGilvray and Mullin, with such as the Board of Aldermen may join, to inquire and report to the City Council whether the engine cannot be exchanged for a more effective one, and upon what terms, or whether it cannot be improved to advantage.

Sent up for concurrence.

N. A. THOMPSON, *President pro tem.*

In Board of Aldermen, Aug. 3, 1857.

Concurred, and Aldermen Peirce, Brewster and Hatch were joined.

PELHAM BONNEY, *Chairman.*

Aug. 4, 1857.

Approved.

ALEXANDER H. RICE, *Mayor.*

CITY OF BOSTON.

October 31*st*, 1857.

The majority of the Joint Special Committee appointed under the order of July 23, and approved by his Honor the Mayor August 4, 1857, to whom was referred the order relating to the steam fire engine, the "Miles Greenwood," with instructions to inquire and report to the City Council whether the engine cannot be exchanged for a new and more effective one, and upon what terms; or, whether it cannot be improved to advantage, — have attended to that duty, and would respectfully submit the following

REPORT:

The Committee believe that the subject of steam engines for extinguishing fires, and especially the engine known as the Miles Greenwood, was one that the City Council and the citizens generally had a deep interest in, from the fact that steam fire engines have been and are used in other cities successfully, and that the reverse had been the case in our own City, and that the steam fire engine owned by the City of Boston had not been of any practical use, but, on the contrary, had been a source of great expense to the City, and annoyance to the past as well as to the present City Government. The Committee deemed it but a duty that they owed to the City Council and the citizens generally, and to vindicate from censure the present as well as the past City Government, to ascertain the cause or causes of failure of the

steam engine in question to answer the reasonable expectations of the citizens, and also to report upon the practicability of adopting steam engines for the purpose of extinguishing fires, as an auxiliary to our fire department, as has been done in other cities, and let it be known whether the engine owned by the City was of any value, and had been properly used and taken care of, or whether the cause of its failure to be of service to the City was through the ignorance of those persons having charge of her, and prejudice against steam fire engines generally, and this one particularly, as was said to be the case by the friends to this machine; and for the purpose of getting at the facts, and to obtain such information as could be relied upon and would be considered good authority by our citizens, a sub-committee of your Committee was authorized to employ a committee of practical and scientific engineers to examine and report upon said engine. Your Sub-Committee at once selected Messrs. Wm. P. Parrott, Holmes Hinckley, and Lucius A. Cutler, Esqs., gentlemen well known in this city as being skilful in such matters, and perfectly competent to the task which was assigned to them and for which they were selected. That there might be no misunderstanding of what the committee of engineers were expected to do, and what line of inquiry they were to take, your Sub-Committee submitted to them the following questions and instructions, and received the following Report.

To Wm. P. Parrott, Holmes Hinkley, Lucius A. Cutler.

Gentlemen, — The undersigned Committee of the Government of the City of Boston desire you to make an examination of the steam fire engine "Miles Greenwood," and report to us the results to which you may arrive bearing upon the questions submitted.

The object of this examination is to obtain, in a reliable and authentic form, the facts relating to the plan, construction, workmanship and operation of this machine.

We wish you to ascertain, as accurately as possible, the facts relating to what it has done of effective service.

What it has failed to do.

The cause or causes of failure.

What is its present value to the City, in its present condition.

What is its present value, with such alterations as may be applicable, (if any,) and the probable cost of such alterations.

We wish to know if this engine is faulty in principle of construction, or whether her defects are mechanical, and such as can be overcome.

We desire that the examination should be extensive enough to embrace not only the details above written, but to be such as will enable you to report upon all the peculiar details of this machine wherein it varies from the ordinary construction of steam engines, and we desire your opinion upon the value of this peculiar construction.

The Committee also desire your opinion relative to the use of steam engines for extinguishing fires, with such practical views in relation to the same as you may be able to give.

To enable you to make this examination you will, when required, be furnished with such evidence as the records of the Fire Department can supply, and the machine will be placed at your disposal, in some convenient place for making the examination.

OSMYN BREWSTER,
J. B. RICHARDSON,
DAVID F. MCGILVRAY.

To Messrs. Brewster, Richardson and McGilvray, Committee of the City Government of Boston.

Gentlemen, — The undersigned, in accordance with the request and instructions hereto annexed, respectfully submit the following Report:

In making this investigation our means of information have been limited. The only sources available to us have been

the examination of the machine, and the interrogation of the engineer and fireman in charge.

We regret to say that no record has been kept by the Fire Department, of the experiments which have been made to prove the machine, nor of the service performed at fires, so that we are deprived of all the information we hoped to obtain from that source.

The material difference between this machine and steam engines used for other purposes is in the steam boiler, or generator. This is constructed upon a novel plan, patented by Mr. Latta, in 1854. His claim is for dividing the coil, (which forms the interior part of the generator,) commencing with a single pipe, then dividing into two or three, then subdividing into four, or any other number.

This boiler consists, first, of a fire-box, or double case of boiler iron, measuring on the inside four feet three and three-fourths inches transversely to the body of the machine, and three feet six inches longitudinally. Between the outside and inside casing of this fire-box there is a space, varying from one to one and a half inches, technically called the water legs. The distance from the bottom of the boiler to the water line, as indicated by the gauge cocks, is two feet ten inches.

The outside shell on the hinder part of the boiler projects backward in a semi-circular form, bent upon a radius of about one foot, forming the steam chamber.

The grate is placed at the bottom of this fire-box, and is reached by two doors at the back of the boiler.

Within this box, and immediately above the grate, is placed the coil of pipe described by Mr. Latta as his peculiar method of construction. This coil is formed of inch pipe, and the aggregate length of the whole is about sixteen hundred feet. The end next the fire is connected directly with the feed pump, or "doctor." The ends of the system, eight in number, terminate in the steam chamber.*

* It is evident that this arrangement requires that the "doctor" should be kept in motion, and a constant circulation of water maintained through the coil to prevent in-

The water space, when the water is at the level of the gauge cock, contains about six and three-fourths cubic feet of water. The capacity of the steam chamber is six and a half cubic feet.

The water capacity above given does not include the quantity which may be in the pipe forming the coil; that being (when the boiler is in action) a variable quantity.

The water legs of this boiler are contracted in their proportions, and the large quantity of pipe placed in the interior of the boiler contracts also the passages for the heat and products of combustion to the chimney.

We are of opinion that due regard has not been paid to the proportions of the spaces required for the free circulation of the heat and water, and also that suitable space has not been provided for the steam, so that a steady supply could be given to the cylinder.

This boiler is constructed on a principle with which we are not familiar. It appears to possess ability to generate steam with great rapidity, but its action is uncertain and irregular. It is indispensable that there should be sufficient space for water to protect the parts exposed to the fire; a free and rapid circulation of the water; a free passage for the heat to all parts of the boiler intended to be heated; and a sufficient reservoir for the steam. In all these particulars we think the boiler of the "Miles Greenwood" is imperfect, and that these imperfections have caused the irregular action of the machine, so far as that has arisen from the supply of steam.

The power generated by this boiler is applied to the forcing pump of the engine by means of a steam cylinder fourteen inches in diameter and twenty-two inch stroke, connected directly with the force pump by its piston rod. The force pump, of course, having the same length of stroke as the

jury to it by the fire, whether the engine is at work or not; consequently, the boiler is often surcharged with water, and the surplus must be discharged by the blow-off cock.

steam engine. The arrangement of the valves and air chambers for the water are similar to other well known steam pumps. The valve for the admission of steam into the cylinder is different from those in common use, which are moved by an eccentric or crank, and is technically known as a trip valve.*

The feed pump, or "doctor," was constructed on a similar principle.

From the best information we can obtain we learn that since the machine came to Boston it has been taken to three fires: Gerrish Market, Gray's wharf, and North street fires. At the first it worked about ten hours. At the second it broke at the very commencement, and was disabled and did no service. At the third, also, it broke immediately. At one fire only can it be said that it performed effective service, and that somewhat of a modified character, as will be more fully explained hereafter.

Besides this actual service at fires it has been subjected to various experimental trials, of the details of which we are ignorant, for the reason before stated. At some of these trials the machine worked (as we are informed) without giving out; but of the duration of the trials, or the circumstances connected with them, we are ignorant. We are informed that at the trials near Park street church, in Court square, on the Common, (trial of the fourth of July,) and in State street, the machine worked for short periods without giving out. At all the other trials it has failed.

At the fire on Gray's wharf the "doctor" broke.

At the North street fire the gearing of the trip valve broke. The engineer worked the machine by hand until both himself and his assistants were disabled. The duration of this service was about half an hour.

This valve was subsequently reconstructed, but it is still imperfect in its action.

* In this term we include both the valve and the gearing which works it.

The performance of this machine at the Gerrish Market fire was observed by one of us, for some time. The prominent fact noted was that the supply of steam was irregular — extremely so — and not controllable with the least degree of certainty. This was attributed at the time to want of practice in the persons in charge of it. Our subsequent examination leaves no doubt upon our minds that it is impossible, with a boiler having the proportions this has, for any man, however careful and expert, to work it successfully for any considerable length of time. The "doctor" gave out at this fire, but was made to work in an imperfect manner through the whole period. The average pressure at this fire would not exceed fifty pounds; the maximum observed, seventy. With this pressure it would not compare with the hand engines in forcing water upwards; and the actual effect observed was but little greater than that of the hydrants under a full head.

After this fire the lower ranks of the coil were found to be warped out of place, and we are informed that the engine has not worked so well since.

We regret we cannot give more in detail the results of the working of this machine. We are obliged, therefore, to state generally, as the result of our investigation, that at every fire it has failed, and at all the experimental trials, except those above enumerated, it has failed to work without giving out; and that in all cases, except the Gerrish Market fire, we are unable to find that it has worked for any notable length of time constantly and certainly. It is probable that the results obtained at the trials which were successful, were rather the result of a fortunate combination of circumstances than of any reliable qualities in the machine itself.

This machine, with its present proportions, we do not believe will ever be serviceable for its intended purpose.

The "doctor," in many cases, seems to have been the cause of failure. In others, the trip valve gave out. In all, the imperfect and irregular action of the boiler has been evident.

To these causes we attribute the failure of this machine. It is not, in our opinion, attributable to incompetency on the part of the engineer in charge, or his assistants. From personal acquaintance, observation and direct examination upon this point, we think they are fully competent to run a steam engine, and that they have been faithful in the discharge of their duties. We believe that no men would have obtained better service from this machine; the faults being in the machine, and not in the men in charge of it.

The value of this machine to the City, in its present condition, will not exceed the value of the old materials of which it is composed, if it is sold as it now stands.

Should it be deemed advisable to develope further the application of steam power to fire engines, it may be used to good advantage for that purpose.

To do this it will be requisite that the boiler should be reconstructed, with different proportions; the feed pump, or "doctor," made to act with certainty; and the steam engine so modified as to act with certainty. We think that all may be done, and at a cost of about three thousand dollars.

With these alterations, made in a proper manner, we are of opinion that this engine may be made serviceable, and that, by the aid of the experience derived from the working of this machine, others may be constructed of greatly diminished weight, and with improved mechanism and proportions.

As to the practicability of adapting the steam engine to furnish motive power for fire engines, there is no doubt upon our minds. It can be done. The best way to do it can be determined only by careful progression from an imperfect machine to that degree of perfection which is desired.

WM. P. PARROTT,
HOLMES HINKLEY,
LUCIUS A. CUTLER.

Boston, September 11, 1857.

After receiving the above report from the Committee of Engineers, and as the question upon what terms the engine could be exchanged for a more effective one was not submitted to the Committee, no information was expected of them. Your Committee, believing that if any exchange was to be made, the proper person to apply to was the original maker of the engine, the following letter was addressed to Mr. A. B. Latta, of Cincinnati, Ohio, the person of whom the City originally purchased the steam fire engine Miles Greenwood.

Boston, Sept. 18, 1857.

A. B. Latta, Esq., Cincinnati, O.

Dear Sir, — Herewith please find copies of preamble and order passed in Board of Aldermen, also the subsequent action of the Common Council upon said order by referring the order relative to the steam fire engine "Miles Greenwood" to a Joint Special Committee, with instructions to inquire and report to the City Council whether the said engine cannot be exchanged for a new and more effective one, and upon what terms, or whether it can be improved to advantage, and at what cost. Also, please find copy of a request and instructions to a committee of competent engineers, with a copy of their Report upon the subject submitted to them.

As the question upon what terms the engine could be exchanged for a new and more effective one was not submitted to the committee of engineers, of course, no information upon that subject was expected of them.

The Committee having the subject in charge, learns that the steam fire engine "Miles Greenwood" was purchased of you, March 6, 1855, for the sum of eight thousand dollars.

You will see by the Report of the Committee of Engineers, the engine has never given that satisfaction, or been of that effective service which was anticipated, and never was a safe and reliable machine; but on the contrary, has been a source of great expense to the City, and annoyance to our prede-

cessors and the present City Government. From representations made to this Committee by one of its members, (who enjoys your personal acquaintance,) that you were a straight-forward, honorable man, and willing to do what would be considered fair and equitable under the circumstances, the Committee have instructed me, (before making the report of the Committee of Engineers public,) to apply to you to answer that question embraced in the order of the Common Council, to see upon what terms you would be willing to purchase said machine, or, if you were not willing to purchase it, on what terms you would be willing to exchange it for an engine of less weight, and one more adapted to our streets, and built with better mechanical proportions; one that would be sure to be mere reliable and effective than this has proved to be.

The Committee are led to believe, by a letter received by one of the Committee from you, (Samuel Hatch, Esq.,) in regard to the purchasing of this engine, that you are laboring under a mistake in regard to alterations or repairs that have been made on it since it has been owned by the City.

The engine is in precisely the same condition as when you last left it, no alterations or repairs having been made upon the main pump, or "doctor;" and the engine is at this time as valuable as it ever was, with the exception of the coils of pipe, or internal portion of the boiler, which have been injured by being over-heated in some of the lower tiers, or coils, and the whole coil can be replaced (as you are well aware) for a sum not exceeding six hundred dollars.

In conclusion, allow me to say that this Committee think that you are more interested in this engine than the City of Boston, and they hope you will be disposed to take into favorable consideration either the purchasing of the machine or the exchanging of it for a new and more improved one. Awaiting your reply, we remain,

Yours respectfully,

SILAS PEIRCE, *Chairman.*

Your Committee received the following reply to the above letter.

CINCINNATI, *Oct.* 5, 1857.

SILAS PEIRCE, ESQ., *Ch'm Com. Fire Dep't, Boston, Mass.*

SIR,—I received your Report on steam fire engine, on my return home, and am not a little astonished at this Report, coming from such a source.

In the first place I wish you to understand that the blade of my square stands at the angle of 90 deg., and is not to be moved under any circumstances. If you had a few thousand dollars in Trust Company Bank, and wished to know whether it could be secured or not, would you stop on State street, and talk with a *broker* to obtain such information? Certainly not, you would go at once to the Mother Bank, as *they* would be likely to know all about it. And why not pursue such a course on this subject. You ought to be aware that I am the *only man* that has successfully applied steam to the Fire Engine, and certainly my opinion is as good as any other man's, on *that subject*, at least.

Your Committee seem to say their *means* of *information* were limited; but it appears by this Report that they knew *all* about it; but I say they do not know anything about the subject; and to prove it, I ask, if the Engineer is so competent, why does not he make the engine work? I worked *that machine* four times before starting east with her, and once at Washington, once at Baltimore, at Philadelphia, and New York, and four times in *Boston*, making in all *twelve times*, and I did not break any thing, or make a failure either.

Why does not your man do the same, if he is so *competent?*

I told your Committee, before you hired him, he was not a suitable man, and would not answer the purpose. Why do you insist on having a certain man, and a machine to suit a peculiar set of opinions of your own people? I am not bound to make a machine suit your notions. It is not your

business to know whether it is made of such *nice proportions*, or of what it is made, so it throws water sufficiently high and with certainty, at all times, or whether it is operated by an ignoramus like myself, or a *full-blooded, live* Yankee, if it works right at the time you want it.

Now, Sir, we have six engines just like yours in nearly every respect (especially in *proportions.*) Many of them are working in this city *every day*, and no trouble with them at all. I have not even been to see after them for some time. This does not look as if it was all the fault of the machine, as your Committee say.

All the operators of our engines are *trained* to the business, and understand it. You have not a man in Boston, who could come to Cincinnati to-day, and take one of these machines in *perfect order*, and operate it a single hour, with certainty, *because* they are not trained to the nature and use of such machines.

Now, Sir, as much as I know about one of these engines, I do not consider myself a first rate operator, for want of practice.

The machine you have, could be brought here, and worked just as well as these we now use, but not by the *men you* employ. If you work these engines at all, you must do it in the proper way, and by men who understand the business.

Opinions have nothing to do with the laws that govern mechanism; if you violate the law, you must suffer the penalty, without regard to the notions or interests of parties.

From the course your Honorable body has taken, I think it but just to conclude, that you do not *really* want the services of steam, or you would have ascertained, long before this, why you did not have success.

Now, in regard to the engine being in its original condition, I can only say, if she is, you spend your money very poorly, by keeping her nearly six months in the shop *repairing* and *altering*. This is hardly probable, to say the least.

Now, Sir, if the City of Boston really wants to use steam fire engines, although I am very busy and have as many orders as I can fill for engines, I will give you in exchange for your engine and five thousand dollars, ($5,000,) a seven thousand dollar ($7,000) engine, provided your city will agree to build or furnish a house within four squares of the City Hall, and horses for it, with all the other facilities by which these machines are worked here, and run it to every fire as it should be for one year.

I have sustained double the damage in reputation, by the *strange* course your City has taken in relation to this engine, that you have. And if you are going to take such a course with another, I do not want to furnish it for you, because I can put it in such place, where it will be used regularly, and make capital for itself.

You know but very little about the use of the steam fire engine in Boston, or a very different course would be pursued in regard to it.

Yours respectfully,

A. B. LATTA.

After receiving the above letter, (comment upon which we deem to be unnecessary,) it was seen that no bargain could be made with Mr. Latta, that your Committee could recommend to the City Council to authorize; and that the City Council might have all the information upon the subject that could be obtained, a sub-committee was instructed to address a letter to Mr. Holmes Hinkley, President of the Boston Locomotive Works, located on Harrison avenue, in this city, and the following letter was sent him and reply received by your Committee.

BOSTON, *October* 20, 1857.

TO HOLMES HINKLEY, ESQ.

DEAR SIR,—The undersigned, a Sub-Committee upon the subject of the Miles Greenwood steam fire engine, desire to receive from you a proposal naming a definite sum for which you will take the engine as it now is, put it into efficient working order, and maintain the same in working condition for six months, casualties excepted. The consideration to be paid in full at the end of six months, should the engine prove to be efficient and applicable to the purpose of extinguishing fires.

Your obedient servants,

OSMYN BREWSTER,
JOSIAH B. RICHARDSON,
Committee.

BOSTON, *October* 27, 1857.

OSMYN BREWSTER, and JOSIAH B. RICHARDSON, ESQUIRES, *Committee.*

GENTLEMEN,—I have received your communication of the 20th inst., in relation to a Steam Fire Engine.

In reply, I would hereby propose to take the "Miles Greenwood," as it now stands, and substitute a new boiler, and a new pump, and such other fixtures as the case may require, and warrant the new machine to be at least equal in capacity for discharging water per hour for extinguishing fires, in amount equal to that of any two of the hand-power engines now in the service of the City, and after a trial of six months should the machine prove efficient and reliable, the City then to receive it and pay the sum of three thousand dollars.

Yours truly,

HOLMES HINKLEY.

As Mr. Hinkley is well known in this city as a good practical mechanic, and well acquainted with all that relates to steam engines, boilers, and all hydraulic machinery, and a responsible man, perfectly able to fulfil any contract that he undertakes, your Committee would recommend the passage of the accompanying order.

Signed.

OSMYN BREWSTER,
JOSIAH B. RICHARDSON,
DAVID F. McGILVRAY,
JOHN R. MULLIN.

CITY OF BOSTON.

In Common Council, Nov. 5th, 1857.

ORDERED, That the Joint Special Committee on the subject of the steam fire engine "Miles Greenwood," be and are hereby authorized to contract with Holmes Hinkley, for such alterations and repairs upon said engine as they may see fit: *Provided*, the contract so made shall be in accordance with his proposal to said Committee, under date of Oct. 27, 1857, said contract not to exceed the sum of three thousand dollars.

ALSO, ORDERED: That the expense of said repairs and alterations be charged to the appropriation for the Fire Department.

CITY OF BOSTON.

A minority of the Joint Special Committee on the subject of the steam fire engine Miles Greenwood, would respectfully

REPORT:

That in their judgment no further outlay should be made on this machine, believing that the work of re-constructing it will be more than a new machine can be obtained for next year, and that the delay and reference to the next City Council will not be detrimental, but a decided advantage, inasmuch as so many improvements are being made in these machines, not only in this city, but in New York, Philadelphia, and Cincinnati. Your Committee believe that the next City Council will be able to purchase a new and improved machine for less money than this can be repaired for, and yet be an old machine. In view of these facts, your Committee would recommend the reference of the whole subject to the next City Council.

SAMUEL HATCH,
SILAS PEIRCE.

CITY HALL, BOSTON, *Oct.* 30, 1857.