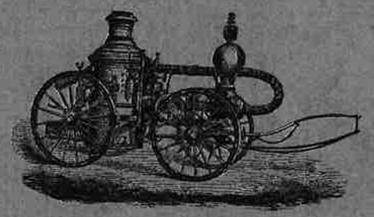
1879. G. F. A.

CLAPP & JONES
MANUFACTURING COMPANY

BUILDERS OF

Steam Fire Engines,



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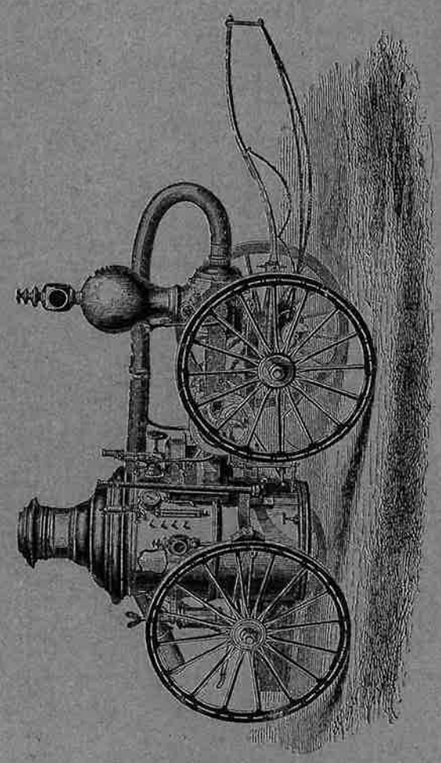

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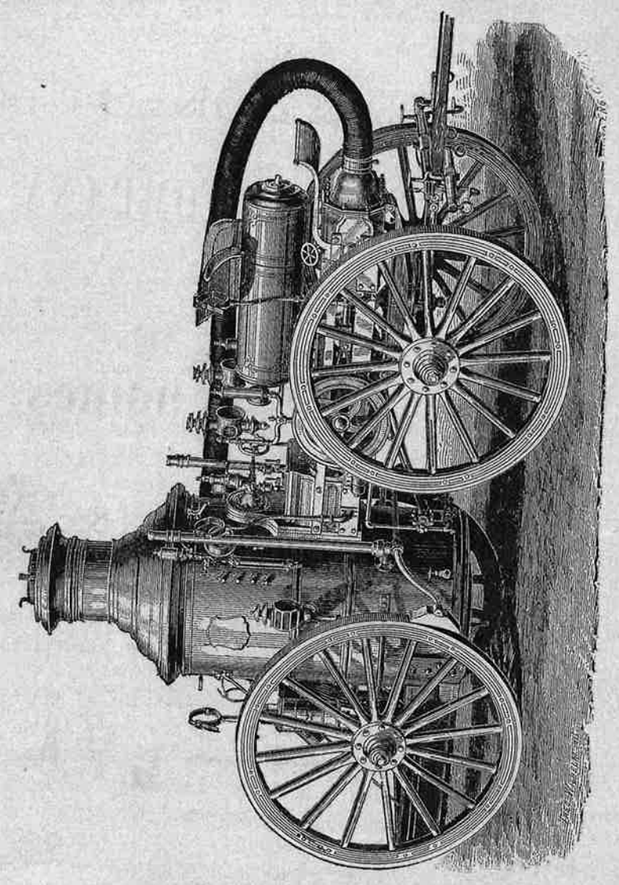


CLAPP & JONES

STEAM FIRE ENGINES

OFFICE OF THE CLAPP & JONES MFG. CO.,
HUDSON, N. Y.

We take pleasure in presenting a new edition of our Circular, and embrace the opportunity to return to our patrons and friends our hearty thanks for the very liberal patronage we have received from all parts of the United States, and from foreign countries. We desire also to acknowledge our obligations to the Chief Engineers of the various departments where our engines are in service, and also to the engineers who have run them, for their kindness in showing their engines and explaining the advantages they possess.

"Testimonials," "records of trials," and "letters of recommendation" have accumulated to such an extent that we have been compelled to omit very many, and to abbreviate all to the lowest possible point, in order that our circular may not be too large for general use.

We now build *six separate and distinct sizes* of our Steamers, and are therefore fully prepared to furnish an Engine adapted to meet the wants of any locality.

All our Engines are constructed of the very best materials known, for the various parts, and the pieces are made to conform to standard gauges, so that all the pieces and parts are of the same dimensions in Engines of a corresponding "size."

We aim to build the *best* Steam Fire Engine in the market, and intend to keep *ahead* of all competitors in the future as we have in the past; we are therefore continually adding improvements to our Steamers, the whole time of the Superintendent, Mr. M. R. CLAPP, being devoted to the construction of Engines, and every Steamer is built under his direct supervision.

Attempts have been made by some of our competitors to mislead the public as to the "CENTENNIAL TRIAL" of Steam Fire Engines, asserting that it did not establish the superiority of either Engine; that all the builders received Medals and Diplomas, and that all the Medals and Diplomas were exactly alike.

The facts are, that the "Centennial Trial of Steam Fire Engines" was the most thorough and complete test ever made in this country, and doubtless in the world. Every possible arrangement was made to determine which was the best engine, the trials being conducted under the direction of Wellington Lee, Esq., as expert, (formerly a builder of Steam Fire Engines,) and Messrs. Chas. T. Porter, Joseph Belknap and Emil Brugsch, all well known, and standing high as practical mechanical engineers.

There were *ten trials* running through four days, all calculated to show the power and durabilty of the Engines.

The judges prepared and submitted a very minute and thorough report of the trials, and this report, covering 60 pages, has been published by the Centennial Commissioners, (see extracts on pages 101 to 106 of this circular.)

Of the eleven Engines originally entered, *four* "went through all the trials without an accident sufficiently serious to interrupt their regular work" *Three* of these Engines were the Clapp & Jones, and were *all* the Engines we had at the Exhibition; and while we concede that the Medal and Diploma received do not show any superiority, we *do claim* that this report made by such practical men after so thorough and long continued a trial and such careful examinations and measurements of the different parts, establishes *beyond question* the fact that our Engines *were superior to all others* exhibited.

Specifications, prices, and any information required, furnished upon application.

HUDSON, N. Y., April, 1879.

CLAPP & JONES MANUF'G CO.

We build *six* sizes, designated as follows, viz:

6,600 pound Engine (double.)
5,600 pound Engine.
4,600 pound Engine.
4,200 pound Engine (double.)
3,800 pound Engine.
3,400 pound Engine.

This method of designating size of Engines is the only true mode, and was adopted by the Judges and Experts at the Trial at the Centennial. As it is also more convenient for all parties interested, we shall hereafter classify in this way only.

DESCRIPTION OF ENGINE

Our engine is what in common phrase is called a "Piston Engine," which, after many attempts to supersede it, is by all first-class engineers and mechanics conceded to be the only true method of working steam and water.

The machinery is so arranged that the connections between the steam and water cylinders are direct, through piston rods, and not through shafts and gear, as in some engines, nor through cranks and connecting rods, as in others. The friction is no greater while working through long lines of hose, or during the hardest work, than when doing the lightest.

The economy of this principle in the use of steam, and the very small amount of friction while working, requiring much less fuel and oil, and causing very little wearing of parts, makes it specially worthy the attention of those in want of a first-class Steam Fire Engine.

We give below some of the advantages we claim:

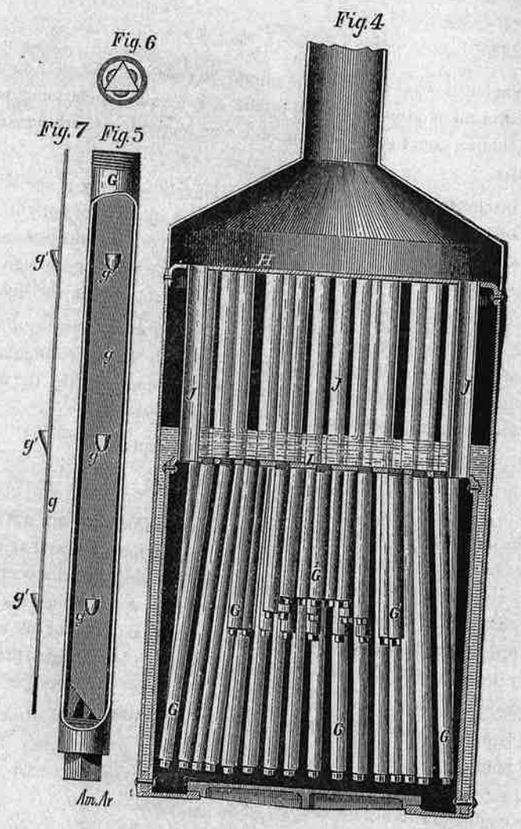
CONSTRUCTION.

The construction of our engines is so simple that they are not liable to get out of repair, and do not require an engineer so well skilled as more complicated machines. They are so arranged that the center line of pressure comes in the center of the frame work, which gives the greatest strength with the least weight of material, enabling us to produce an engine to do the same work with much less weight than any other.

They are made to carry the Suction on the Engine and attached to the pump. The hose pipes are also carried on the Engine. There is a large fuel pan on the back of the boiler. All tools necessary to work the engine are furnished, and boxes to carry the tools in.

Superiority of Boiler.

A vertical section of the boiler of the engine is seen in Fig. 4. It is of the vertical kind, with both fire and water tubes, the fire tubes, J, extending from the crown sheet of the fire box up through the top of the



shell, and the water tubes, G, G', G", being pendant from the crown of the fire box. The outer rows, G, G, of water tubes extending nearly to the bottom of the fire box, and surround rows of shorter tubes, G', G,' and G", G", which are about half the length of the outer row. One of these water tubes, detached from its position, is shown in Fig. 5, and is broken away to exhibit the arrangement provided for the circulation of the water. Fig. 6 is a transverse section of the tube, showing the diaphragms, one of which is seen detached in Fig. 7, which are arranged so as to form a triangle when inserted in the tubes. In this way the water is isolated into thin films or sheets, so that the generation of steam will be very rapid—the diaphragm serving to establish return passages for water to supply the place of that converted into steam and carried up by steam. By the arrangement of openings g', g', much of the water lifted will be allowed to return to the return passage, without passing all the way up to the top of the tube.

The boiler has great steaming capacity, and is provided with a peculiar arrangement for the circulation of the water (see description and cut on page 6), which is of the highest importance in boilers that operate so quickly and are required to make so much steam in so small a space as is necessary in Steam Fire Engines. Steam can be generated from cold water in *from three to five minutes* from time of lighting the fire. The boiler is so constructed that every part can easily be got at in case repairs are needed. The tubes are screwed in the tube sheet and can be taken out and replaced in a very short time. These boilers will not foam or prime as most others do that are used for this purpose—they will bear the strongest firing without the least danger of overheating, and will make all the steam that can be used in the engine. Where fresh water cannot be had, salt water can be used in our boilers.

The connections of the engine to the boiler are made so that there are no steam pipes exposed to the cold air, or joints to become leaky. This arrangement, as well as the arrangement of the steam and exhaust pipe, is the invention of M. R. Clapp, and both are secured by Letters Patent, owned by this Company.

We put on a variable exhaust nozzle, that is very easily and quickly operated by the engineer. By it the draft can be increased or lessened at any time, thereby generating more or less steam as circumstances may require.

PUMP.

The Pump is of novel construction, and is so arranged that by taking off the heads, (which can be done in less than ten minutes,) the valves are taken out at the same time. This makes it very convenient for repairs or cleaning out, if either should be required. The arrangements and proportions are such, and the displacement by the plunger so large in proportion to the space at the ends of the pump, that we can lift water to a very great height.

The Pump is entirely of composition (copper and tin), with no iron parts to rust. It is so constructed as to require no leather packing or springs.

By introducing the water in the centre of the ftont head, (as shown in the cut on page 9,) we have the advantage of an equal distribution of the water through the annular space to all sides of the pump cylinder and valve chambers, making a very free water course to the valves. We gain the further advantage of water enough being retained in the pump to make sure of drawing water when first starting the engine, even on very high lifts. We thus entirely avoid the necessity of any connection with the boiler for the purpose of "priming" the pump, or of providing any other means of doing what all other fire engine builders and pump makers have found it necessary to do, that is, to put *water* or *grease* into the pump either before or at the time of starting on very high lifts.

It is stated by some that they make pumps that will lift water without priming; but they invariably put on conveniences for priming. Here seems to be a contradiction between their statements and their mechanical arrangements which we leave them to explain.

The air chambers are so placed on the pump, in connection with the water passages, that it will bear working at a very high speed.

Description of Pump.

Fig. 2. (page 9,) gives a side elevation, one half of it shows an external view, while the other half is shown in section on a vertical line through the centre.

Fig. 3 shows an end view with the upper half shown in section on a line through the centre of the suction valves which is about one-fourth of the length of the pump from the end. The same letters refer to like parts in both figures. "A" is the front head made with a chamber or wa-

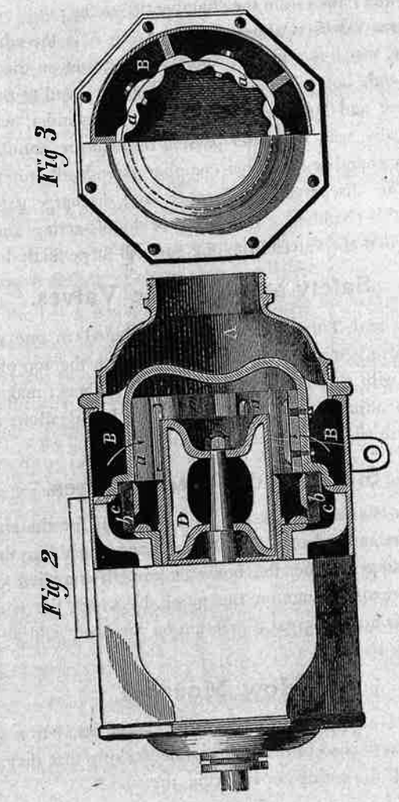


Fig 3

Fig 2

ter space to receive the water as it comes into the pump through the suction hose; this chamber is connected to the chamber "B", (which is also on the suction or induction side of the pump,) by the annular space around the valve chamber. "D" is the pump plunger, which is made entirely of metal, water packed. *a, a, a,* are the induction valves through which the water passes from the chamber "B" to the pump cylinder. The shape of these valves is shown in Fig 3. *b, b,* is the eduction or discharge valve, which is a ring of India Rubber, put on the inner end of the pump head, but is enough longer than the head to reach over the annular space and lap over on a ring on the cylinder, which forms a part of the valve seat, the water passing through the annular space into the discharge chamber *c, c;* this chamber extends all around the pump cylinder. The discharge air chamber, and discharge gates are connected with this chamber. The pump is double-acting and both ends are alike, so that the valves from one end will fit perfectly in the other.

Safety and Throttle Valves.

The Safety and Throttle valves are combined in one piece. The The safety-valve is made with a heavy spring on the top of the valve, doing away with the lever and scale, as in others, making it more convenient to adjust to the pressure required, and allows a very free escape of steam when it reaches the point of blowing off.

Steam and Water Gauges.

We put two Steam Gauges on the boiler, one for the engineer and one for the fireman; also a Glass Water Gauge, enabling the engineer to see at a glance whether the boiler is properly supplied with water; also a water pressure gauge on the pump, by which the engineer can see that there is not too great a pressure on the hose, and also that the engine is doing its duty.

How Mounted.

Our Engines are mounted on large wheels, and strong, yet easy springs; and there is so little motion while working that they do not require jacking off the springs or blocking the wheels.

Material and Workmanship.

We invariably use the best materials of the different kinds used in their construction. The pump is entirely of composition so that salt or any other impure water will not injure it. The workmanship cannot be

questioned, for we employ none but first-class workmen. We put on any style of trimming that may be required.

Sizes and Styles.

Our smaller sizes are usually made to be run by hand, and the larger sizes are fitted with pole for horses and seat for driver; but they are all made so that they can be changed very easily for horses or to be run by hand. Brakes are attached to all. Those on the hand machines are operated from the fuel pan, and the horse machines from the driver's foot board.

Summing up the above the following points of superiority are especially claimed for the Clapp & Jones Engine:

1st. That it is the *simplest* engine now built, and therefore less liable to accident or to get out of repair than any other.

2d. That the boiler has extraordinary capacity for making steam, and will stand the strongest firing without injury.

3d. The steam can be generated with very great rapidity, the engine started, the throttle valve opened full, and the steam increased while working, to any pressure required.

4th. That dirty or salt water can be used, when necessary, without injury to pump or engine.

5th. The pump is a model of effectiveness and simplicity. It has few working parts, large water courses, durable rubber valves, and can be taken apart in a few moments for cleaning, if necessary.

6th. By the use of a connecting rod, instead of link and sliding box, as in other engines, a large saving is effected in friction and seventy-five per cent. in cost of oil.

7th. The stuffing boxes are all outside, and can be taken up while the engine is running.

8th. The engine is so hung as to bring the centre line of pressure in the centre of the frame work, giving the greatest strength with the least weight of material, and entirely avoiding the tendency to spring or bend.

9th. By our variable exhaust nozzle on the boiler, the engineer can regulate the force of the draft, and control the fire so as to make just the quantity of steam required.