SCIENTIFIC AMERICAN

A WEEKLY JOURNAL OF PRACTICAL INFORMATION, ART, SCIENCE, MECHANICS, CHEMISTRY, AND MANUFACTURES.

Vol. XXXV.—No. 9. [NEW SERIES.] NEW YORK, AUGUST 26, 1876. [$3.20 per Annum. [POSTAGE PREPAID.]

IMPROVED HAND FIRE ENGINE AND HOSE CARRIAGE.

In the accompanying engravings we illustrate an improved hand fire engine and hose carriage combined, which has been especially constructed with a view to meeting the requirements of towns and villages, and isolated factories which do not afford the facilities of steam or the advantages to be derived from a system of waterworks. Hand engines, as usually constructed, require a large gang of men to operate them, making them comparatively useless in localities where 40 to 50 men cannot be assembled at a moment's notice.

The engine herewith represented, we are informed, can be operated by from two to fourteen men, according to the amount of water and the distance the stream has to be thrown. Two men can readily draw it over all common grades. At present the manufacturers are building one size only, the entire equipment weighing only 500 lbs., the hose reel having capacity for 800 feet of 1½ inch hose.

In readiness for fire, the engine is always mounted on the carriage, as shown in Fig. 1, while Fig. 2 shows the engine as detached from the hose carriage, with leading hose run out. Upon an alarm of fire being given, the first man or two at the engine house starts for the scene of action with the machine. Upon arrival the engine is disconnected from the carriage or hose reel by simply turning three clamp fingers, which drop into loops, at A. Two men then lift the engine from the carriage, it weighing alone only 325 lbs., by the handles, B, setting it upon its own ways, C, as shown in Fig. 2, leaving the hose carriage ready to unreel the hose. The hose being always coupled to the engine, no time is lost, as the first sweep of the brakes, after the suction, D, is dropped into the water, starts the stream. The engine is so light that it can be lifted and set over a well, cistern, or reservoir. It really needs no priming, although a priming bucket is provided at E, leading by a stop-cock into the pipe running from the suction to the cylinder. This would prove advantageous should the valves, through non use, become dry. The engine has, of course, two cylinders, the diameter of each being 4 inches, the throw being 6 inches, thus giving a powerful stroke, the brakes moving through a circle of 2 feet 9 inches.

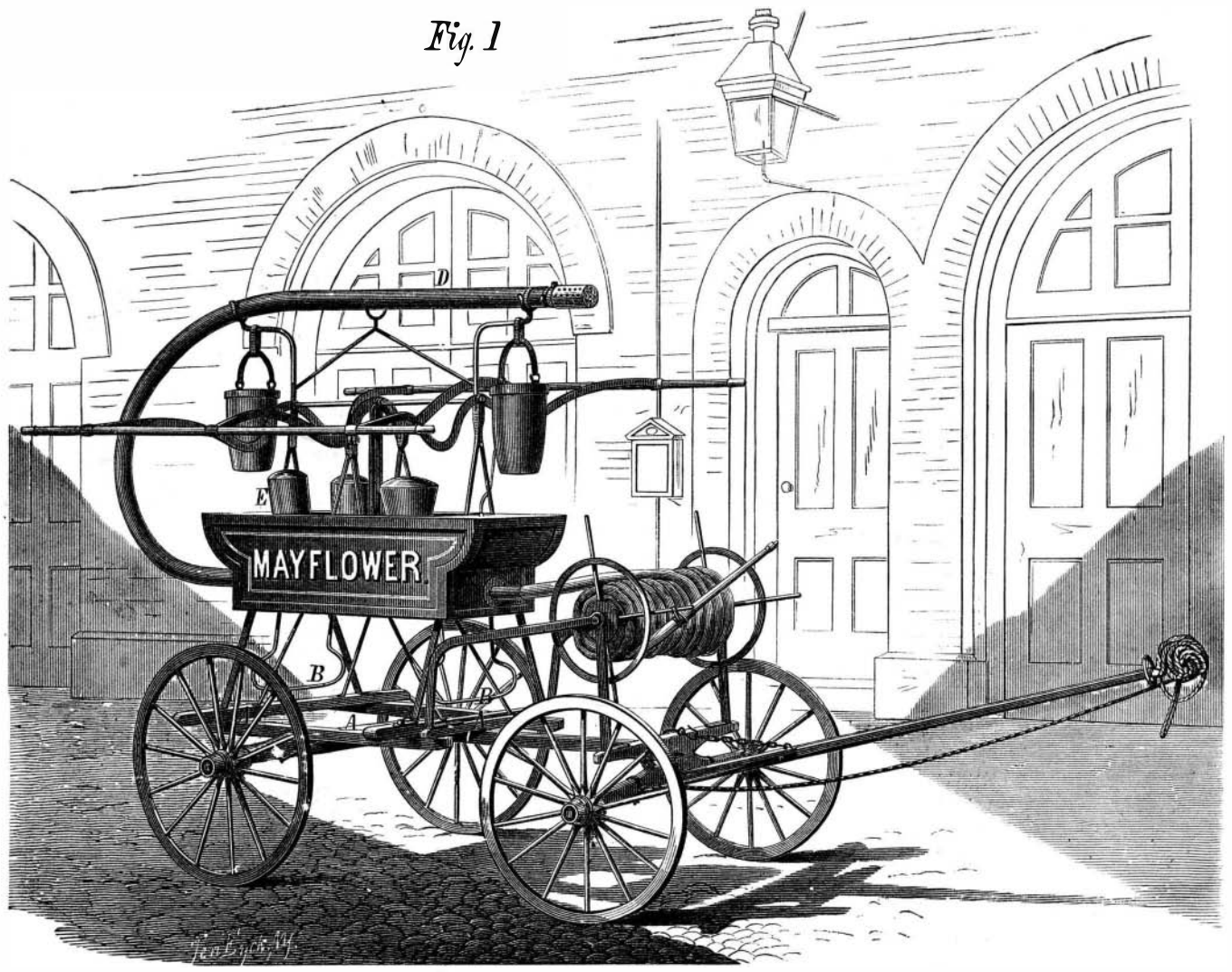
Both air chamber and water chamber are copper, and the valves are composition. The hind wheels are 36 inches high, the forward ones being 32 inches, and the latter swing under the reel, allowing the machine to be turned in its own length. Twelve feet of 2½ inch suction hose are provided, with which are used 1½ inch leading hose with half inch nozzle.

We are informed that with fourteen men the machine has thrown a half inch stream 156 feet horizontally, drawing water perpendicularly 12 feet, and discharging through 100 feet of hose. This range of stream is, as will be seen, sufficient to cover any ordinary factory, warehouse, or dwelling, enabling fires on roofs to be extinguished by the machine stationed on the ground outside.

The makers furnish with the apparatus 12 feet of suction hose, brass strainer, draw rope, spanners for suction and leading hose couplings, two fire buckets, oil can, etc. The complete machine, in readiness for the application of leading hose, is sold for three hundred and fifty dollars at their manufactory.

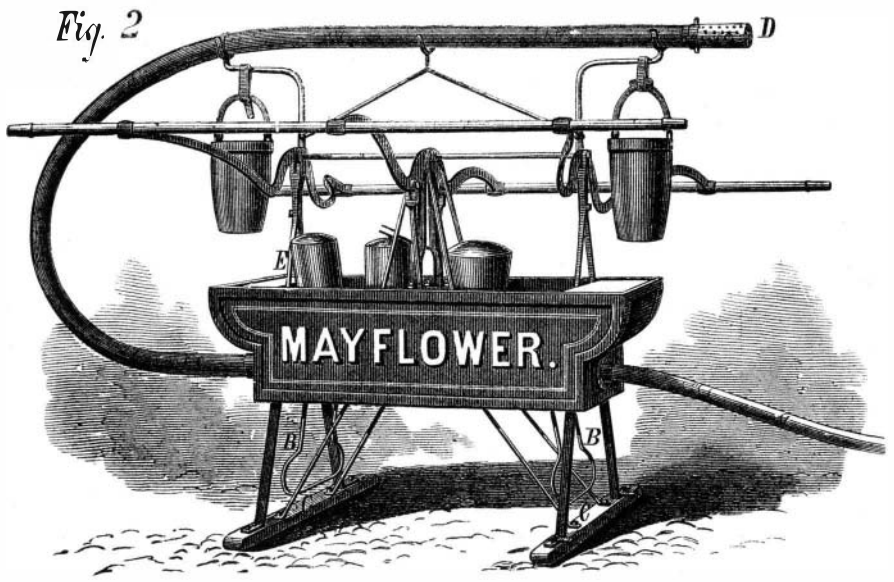
The owner of the patent is A. M. Hall, Malden, Mass., long and well known throughout the country; and the manufacturers are S. C. Forsaith & Co., Manchester, N. H., at whose works the machine can be seen and practically tested at any time. Letters of inquiry or orders should be addressed to either of the above.

Fig. 1



HALL'S HAND FIRE ENGINE AND HOSE CARRIAGE.

Fig. 2



Mineral Wool.—Curious Chemical Change.

The name of mineral wool has been given to a fibrous form of blast furnace slag formed by a jet of steam blown through it while in a liquid state. Professor Wolpert of Kaiserslantern says that it should only be employed with great caution in architecture for filling under floors and wainscoting, etc., for this slag at present always contains sulphide of calcium, which is converted, by the action of the carbonic acid in the air and the water which reaches it when the floors are scrubbed, into carbonate of lime and sulphuretted hydrogen. The latter, as we know, is a gas which is both unpleasant and injurious to health. Before using this slag it should be tested for sulphide of calcium by pouring water and vinegar upon it, when the well known odor of sulphuretted hydrogen, resembling rotten eggs, will be perceived if any sulphuret of lime is present.

Plateau's Soap Bubble Solution.

Terquem publishes the following improved process for making a solution suitable for Plateau's experiments with thin films, soap bubbles, etc.: Marseilles soap is shaved up into thin strips and placed in the sun or on a stove until perfectly dry. It is then put into a bottle with exactly 80 per cent alcohol (specific gravity 0·865) until saturated at 60° Fah., when the solution will mark 74° on the centesimal alcoholometer and have the density of 0·880. The solution must be made cold, for when hot the alcohol will dissolve a large quantity of soap and the liquid will become solid on cooling. A mixture of glycerin and water is made so as to stand at 17·1° Baumé, or have a density of 1·35 at 68° Fah., which corresponds to equal parts of each when the glycerin is most concentrated. It is well to heat the bottle containing this mixture in a water bath.

To prepare the final solution, take 100 parts by volume of the diluted glycerin and 25 parts of the alcoholic soap solution; the mixture frequently becomes turbid because the commercial glycerin contains gypsum and lime. It is boiled to expel the alcohol, when the temperature will rise above 212° Fah. It is now allowed to cool, and then poured into a graduated measure and enough water added to make it equal to 100 volumes. It is filtered several times to remove the oleate of lime formed. This filtration is difficult because at first it runs milky through the filter. It is best to filter through a funnel with a tuft of cotton in the neck, as the cotton can be pushed in loosely or tightly to regulate the flow of the liquid. Soap bubbles which are not more than four inches in diameter will keep for an hour if laid on a small tripod under a bell jar.—*Poggendorff's Annalen.*

Fireproof Dress.

Mr. Oestberg, a Swede, has been conducting some sensational experiments in various parts of the Continent with his fireproof suit. This is made in two layers, the inner one of india rubber, the outer of English leather, the head being protected by a helmet resembling that worn by divers. At the girdle is fixed a piece of hose, which serves both for air and water. The air pipe, fed from two blowers, is placed inside the water pipe, and brings the air, after being cooled by the surrounding water, into the inner part of the dress. The air inflates the costume, passing away through the two small openings made for eye pieces. The current of air not only keeps the inclosed body cool, but drives smoke and flame away from the eyes. At the back the water pipe divides, one branch serving as an extinguisher, the other passing into the outer coating of the dress, the stream being distributed over the whole outer surface. With the apparatus on, the experimenter stood in the middle of a pile of burning shavings and logs without taking the least harm. If a continued use of this apparatus shows similar results, it is likely to be a useful invention