

Science and Art.

Trial of Fire-Engines.

[On Christmas-day, in this city, Messrs. Lee & Larned brought out their two steam fire-engines, the "J. C. Cary," illustrated on page 89 of the present volume of the SCIENTIFIC AMERICAN, and the "John G. Storm." They were tried, says the *New York Tribune*, at a pole which is 165 feet in height, surmounted by a ball and cap, the former 171 feet from the ground, the latter 179 feet 10 inches. The performance of the "Cary" exceeded any yet achieved by any fire-engine, whether worked by hand or steam power. She threw a two-inch stream to the top of the cap, and a 1½ inch fully 25 feet above it, making the total height not less than 205 feet perpendicular. Plying horizontally, she threw a 2½ inch stream, through an open butt, a distance of 209 feet. At her highest speed, she made 264 revolutions per minute, discharging upward of 1,200 gallons of water. The "John G. Storm" is but just completed, and had on this occasion her first or experimental trial. Her engines and pump are the same as those the "J. C. Cary," but her boiler power and her weight considerably less. She threw a 1½ inch stream to the ball, a height of 171 feet, which is fully equal to the performance of the "J. C. Cary" on its first trial. The engines propelled themselves from the Novelty Works to the place of trial, by the way of Twelfth street, the Bowery and Canal street, a distance of three miles, carrying each about ten men in 25 minutes. Both engines performed in all respects to the satisfaction of the builders, and of the various representatives of the Fire Department and of the insurance companies who were present. They were in charge of the Exempt Engine Company, Zophar Mills, Foreman. The new engine is named after the President of the Lennox Insurance Company, who has borne a leading part in securing the introduction of steam fire-engines.

Agricultural Improvements Wanted.

A correspondent—T. Waters, of Shop-spring, Tenn.—wishes us to call the attention of inventors to harrows and portable steam-engines for farmers. He states that a two-horse harrow, so constructed as to have a lateral in conjunction with its forward movement, would be a great benefit to agriculturists, and at the same time be the source of a good income to the inventor." In reference to the dimensions, and the cost of such a harrow, he says:—"We find that a harrow with a frame of four and a half or five feet wide, made with two sections hinged together, and teeth six inches apart, is about as much as two horses can operate on our lands. If it had a side motion of four inches, for every six inches forward, it would not be liable to choke, and it would pulverize the soil in a superior manner. It should not cost more than \$25, be very strong, have teeth 14 inches long, and one inch square at the top." He also says:—"We want a lighter and superior steam-engine for agricultural purposes than any which has yet been brought before the public."

With regard to portable steam-engines, there can be no difficulty on this head. There are engineers who can and will build engines of any size to suit the demands of agriculturists. The great object of care in a steam-engine should be the boiler; it should be made of the best materials, so as to be strong and perfectly safe under all circumstances.

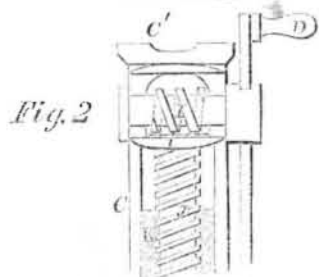
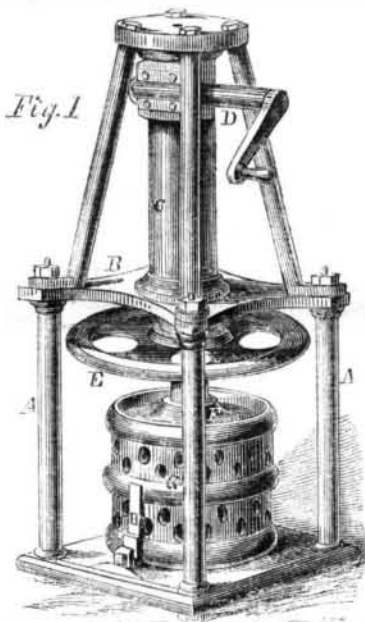
A Cheap Filter.

In some situations spring water cannot be obtained, hence rain water is employed for all domestic purposes. To render it fit for drinking and cooking, it requires to be filtered, as showers carry down insects and their ova from the atmosphere and dust from the roofs upon which they fall. It is best to purify rain water before it enters the cistern, and for this

purpose a good filter can be made by any person at the cost of only a few shillings. The way to do this is as follows:—Construct a tolerably large and stout wooden box, with a hole in the bottom or at the side near the bottom, and in connection with a pipe leading into the cistern; nail a coarse cotton or linen cloth over its bottom inside, and then fill it up to within three inches of the top with layers of clean gravel, sand, and charcoal, and over the top of these secure a stout cloth. Into this box lead the pipe, and as the rain passes through it to the cistern, it will be purified and fitted for drinking or any other purpose. The top cloth of this filter can be easily removed and frequently washed. At a little extra cost, this filter may be made so as to rotate on an axis to be turned upside down, and washed out by making clean water rush from its bottom through to the top. It is necessary to make such filters somewhat large to carry off water rapidly during heavy showers.

Miller's Press.

The many appliances for lifting heavy weights with a small amount of power that are in general use, seem almost to leave no room for any further invention or improvement, but our illustration fully proves the contrary, and shows that improvements valuable and complete have recently been made. Fig. 1 is a view of an improved wine press for expressing the juice from grapes, or for squeezing the whey from cheese, or any suitable purposes, and Fig. 2 shows a section of a jack press for lifting heavy weights, on the same principle.



We learn from a Philadelphia exchange, that recently a man weighing 156 pounds, lifted, with the aid of one of these presses, the great weight of 37,332 pounds, merely by the application of his strength to the lever 20 inches long, and the press weighed only 45 pounds.

A are four posts, supporting the frame, B, in which is secured the cylinder, C, that contains the vertical screw, J, nut or grooved top, K, and horizontal screw, I, that rotates it, power being given to I by the handle, crank, or lever, D. To the lower end of the nut, K, in which it works, and that is fitted into the case, C, is attached a hand wheel, E, and follower, F, that presses the contents of the press or case, G, that is attached to the bottom plate of the frame by spring catches, H. C' (Fig. 2) shows the shape of the top of the jack press when it is used to lift.

The operation is as follows:—Grapes or any other substance to be squeezed, are placed in G, and the hand wheel, E, turned. This moves K around J, and brings the follower, F, quickly upon them, and as long as convenient this method of pressure can be adopted, but when it becomes too hard work, the crank, D, is moved, and the screw, J, slowly rotated by the screw, I, when the follower is pressed down slowly, but with great force. These presses are suitable for hand or power; and for lightness or power, for lifting jacks or presses, they are as near perfection as we have ever seen.

The inventor and manufacturer is D. L. Miller, of Madison, N. J., who should be addressed for further information. Specimens are on exhibition at the Fair of the American Union, No. 620 Broadway, for the inspection of mechanics, &c. Patents were obtained for the jack, Dec. 1st, 1857, and for the press Aug. 7th, 1858.

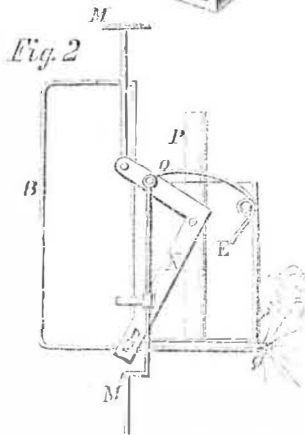
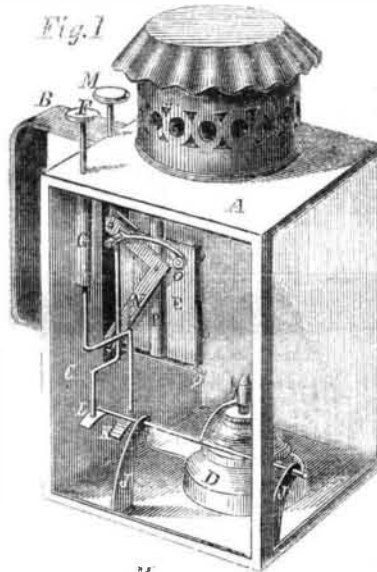
Roesler & Frey's Self-Lighting Lantern.

There is not a sailor who has not experienced the difficulty of lighting the bow, stern, or binnacle lights, some dark and boisterous night when

"The stormy winds did blow."

And there are few farmers who have not wished for some safe means of lighting a lantern in a barn, among hay or fodder, without the danger of setting it on fire. Such a lamp or lantern is the subject of our illustration.

Fig. 1 is a perspective view, and Fig. 2 a diagram of the working parts.



A is the lantern, and B the handle on the back, C. The lamp, D, is placed on the bottom of the lantern, so that the extinguisher, I, will fall directly over it, and put it out, when operated for that purpose. To the door, C, a match case, E, is attached, that is slightly enlarged at its center, P, to admit of a spring to continually feed the matches to the bottom plate of the box. To this match box, E, is hinged a bell crank, N, that is kept in the position shown in Fig. 2, by the spring, O, and to whose lower end is connected by a slot a small piece, extending through a slot between the bottom plate of E, and the case itself, and the other side of the small piece fits in a slot in a corresponding bell crank, N. To the top of N is attached the rod, with its

knob, M, that projects outside the case, and a rod, M', that presses on the pallet, L, on the axle of the extinguisher, that is supported by bearings, J. At the front of the match case are two serrated jaws, Q Q'. A bent shaft, F, passing through a spring case, G, is also placed in the lantern; this, when the knob, E, is pressed, passes on the pallet, K, and throws the extinguisher on to the wick, putting out the light.

The operation is as follows:—The match case being filled with matches and the lamp trimmed, the knob, M, is pressed, the crank, N, forces the bottom match through the serrations, Q Q', and so ignites it, and holds it while it is lighting the lamp, at the same time the piece, M', has pressed on the pallet, L, and thrown the extinguisher off the lamp. The lamp being lighted, the thumb or finger is taken off M, and the spring, O, brings it back, and another match falls down ready to light the lamp again, when necessary.

This simple and very effective contrivance for lighting lanterns in any weather and any position, and extinguishing them without opening the door, is the invention of Messrs. Roesler & Frey, of Warsaw, Ill., and was patented May 18, 1858. Any information concerning the patent (which they wish to sell) can be obtained by addressing them at the above place, Box 464.

Porcelain Pictures.

A fine opportunity for somebody to make a fortune would seem to lie in the invention of some machine or process for producing porcelain pictures. We allude to the flat plates of porcelain, sold in the china and fancy stores, which, when held between the eye and the light, exhibit pictures more or less beautiful, according to the design. There is an extensive and rapidly increasing demand for these articles; but at present the entire supply is imported from Europe. We shall probably allude to the subject again.



INVENTORS, MILLWRIGHTS, FARMERS
AND MANUFACTURERS.

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