New Inventions.

New Portable Forge.

The apparatus shown in our engraving, which we copy from *Le Genie Industriel*, is the invention of M. Hick. It is a portable forge with blast attached, and can carry all the accessories necessary to its use.

Fig. 1 is an elevation, and Fig. 2 is a plan. It is composed of a rectangular box, rounded at its front angles, and open at the top, being supported by two wheels and two feet, and it is provided with handles for its transport from place to place. A back and

Fig. 1

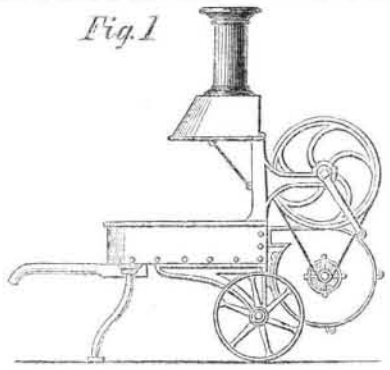
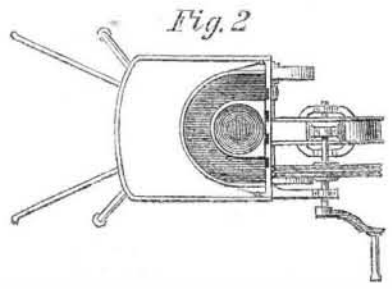


Fig. 2



chimney rise from the fire-box, the lower part of the chimney being developed into a hood. In front of the wheel is the rotary fan or blower rotated by a belt or strap passing around a much larger wheel that is rotated by a crank. The whole can be made of metal, and it is light and convenient, and as the heat of the furnace or fire depends upon the force of the blast; by rotating the crank faster than for common blacksmiths' work, the metals may be fused in crucibles, and many metallurgical operations performed. From its appearance, we should not think that it cost any more to construct than the common portable forge which does not combine with it as this does, a small blast furnace. We should recommend any person wishing to construct one to line the inside of the fire-box with fire clay, and then the whole will last much longer, and bear a considerably greater heat than the bare cast or wrought iron plate.

New Patent Pump.

The importance of the pump as an aid to domestic comfort and the real progress of man, by furnishing us with a plentiful supply of that great blessing, pure water, is acknowledged by all, especially by inventors. This is evidenced by the fact that much of their attention has been given to the improvement of pumps, so as to overcome all the difficulties connected with them, and render them—as the universality of their use demands—perfect in their action.

The subject of our engraving illustrates a valuable improvement in pumps, invented by Henry Zeug, of Elizabethport, N. J., and patented by him July 27th, 1858, the principles and advantages of which will be seen from the following description. Fig. 1 is a view of the pump, with one barrel in perspective and one in section.

The cylinder, B, piston, C, piston rod, D, cylinder bottom, A, and head, G, are all of the usual construction; the pistons are worked by brakers, and in the common way. H is the escape pipe, that passes into the head, G, and so communicates with the cylinder. J is the supply pipe, communicating with the bottom of the cylinder, A. An ordinary ball valve, I, closes the upper end of J in A, and a similar valve in the piston, C, closes the opening in it. The improvement consists in the employment of a loose valve or plate, F, (seen separated in Fig. 2) fitted to and held in place by the piston rod, the two passages, *a a*, allowing the water to pass past it to the escape pipe, H, and these being closed by it when on its seat, prevents the water flowing back through them.

The operation is as follows:—The water that is in the cylinder (or the air, at the first stroke) when the piston is elevated, lifts the valve, F, and forces the water into the chamber in G, and so to H, as in other force pumps, the valve in the piston being closed, the water follows it through the valve, I. When the piston descends, the valve, F, closes and retains the water above it, and I also being closed, the water passes through the piston to its upper part, ready for the next upward stroke. There being two cylinders, the stream from H is always constant and steady.

This is a simple and convenient pump, as any one conversant with these instruments can at once see. Any further information can be had by addressing the inventor as above.

ZEUG'S IMPROVED PUMP.

Fig. 1

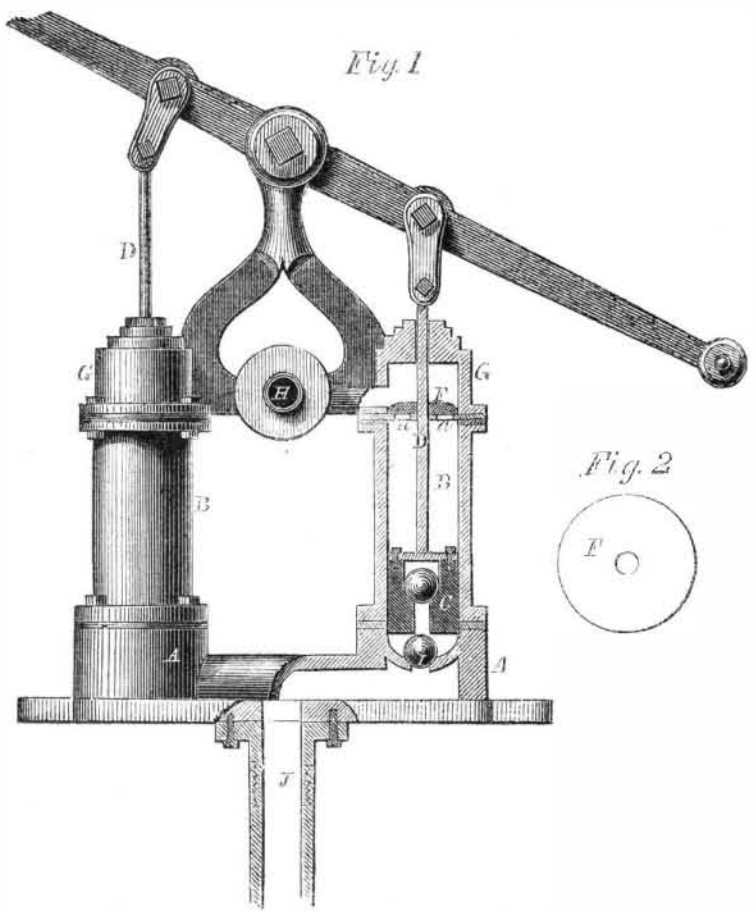
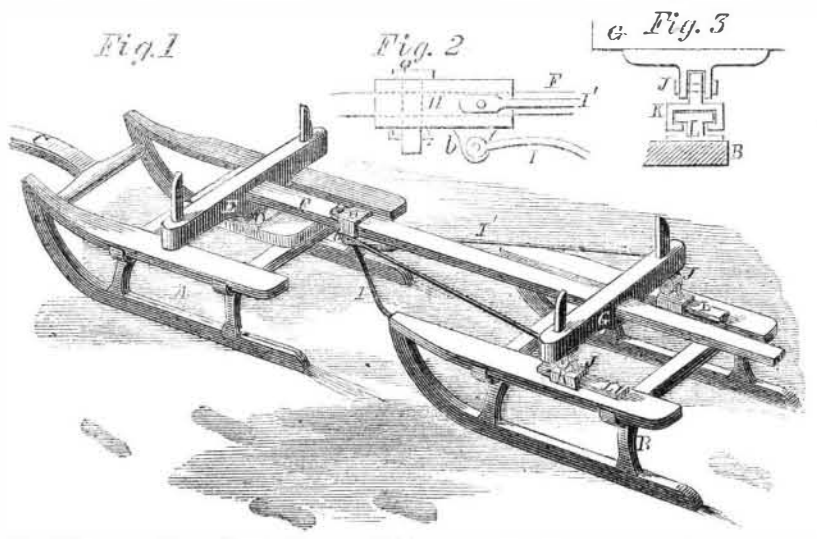


Fig. 2

IMPROVED SLEIGH-RUNNER ATTACHMENT.



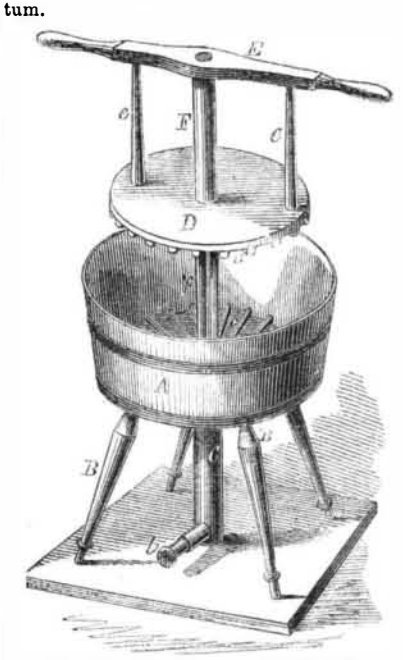
It is, indeed, a great blessing that, while the winter deprives us of so many enjoyments, it brings in its train a corresponding number of compensating pleasures. Chief among these, in our own estimation, is the merry jingle of the sleigh bell, ringing out its jolly music, suggestive of moonlight drives, with bright fires and wholesome suppers at the end of them, taking the place of the dull, heavy sound of the monotonous wheel. "Ah!" says the practical reader, "this is pleasure—what of business?" Well, the subject of our engraving is an improved method of attaching sleigh runners either to the freight wagon laden with merchandize, or to the buffalo-robed seats suitable for transporting the most fairy forms of our imagination.

Fig. 1 is a perspective view of the runners of a sleigh, A being the front one, and B the last one. C is the pole, and D the piece to which the king-bolt of the front cross-tree, E, is attached. To E is secured the perch, F, having secured to it the piece, H, from which rods, I, hinged to it at *b*, pass to the front of runner, B. This perch, F, passes through the cross-tree, G, and the piece, H, is connected with the cross-tree, G, by rods, I′, also hinged at *b*. The piece, H, and its connections are better seen in the outline diagram, Fig. 2. On the last runner, B, are secured T-ways or rails, L, and over these work the suitably grooved pieces or bearings, K, attached by a hinge, J, to a casting secured to G. The section through these parts at Fig. 3 will illustrate this arrangement. By this means the sleigh accommodates itself to any inequalities, and the connection between the runners and the body, has exactly the same action as the springs of an ordinary vehicle.

This, which every one must allow is a great improvement, is the invention of W. W. St. John, of Lima, N.Y., and was patented by him July 13, 1858. He will be happy to furnish any more desired information upon being addressed as above.

Jordan's Washing Machine.

The want of some method of guiding the rubber of tub washing-machines, and controlling in some degree its motion, has long been felt; and the invention which is the subject of our engraving fully supplies this desideratum.



A is a tub, secured to a bench or legs, B. C is a metal tube, the upper end of which is fitted in the bottom of the tub, and opens into it. The tube, C, extends downward nearly to the floor, and is provided with a faucet, *b*, near its lower end. The upper surface of the bottom is provided with radial taper projections, *c*, and the under surface of the disk or rubber, D, is provided with similar projections, *d*. This disk is constructed in the usual way, and has two uprights, *e e*, attached to it near its periphery at opposite sides of its center. The upper ends of the uprights are connected by a cross-piece, E, in the center of which the upper end of a shaft, F, is fitted. This shaft, F, is grooved and slotted at its lower part, *f*, and passes across a wire in the bottom of the hub, and loosely down into the tube, C. This controls the motion, not permitting the rubber to be oscillated beyond an easy distance for the arms of the operator, and also steadies or guides it.

The operation is as follows:—The clothes to be washed are placed within the tub, A, the disk or rubber, D, resting upon them, and the disk is operated by applying the hands to the ends of the cross-piece, E, and giving it the proper motion, so that the clothes receive a perfect rubbing. When the clothes are washed, the rubber is elevated as far as the wire or key across the mouth of C in A will allow it, and the clothes are taken out. The faucet, *b*, being then removed from C, the water is allowed to run away, or fresh clothes placed in the tub in the same water.

The inventor is W. A. Jordan, of Thibodeaux, La., from whom any further particulars can be obtained. It was patented Aug. 24, 1858, and noticed on page 410 of the last volume, Scientific American.

A Lucky Inventor.—It is reported that Mr. Ryerson, the inventor of the recently patented diving bell, which is raised or lowered by means of condensed air, and that is now used in removing Diamond Rock, has sold the right to use his bell in the northern lakes for the sum of $50,000.—*New York Sun.*

The skeletons of leaves may be obtained by soaking them in a weak solution of sulphuric acid, which eats away the body of the leaf, leaving only the fibers, in the form of a delicate network.