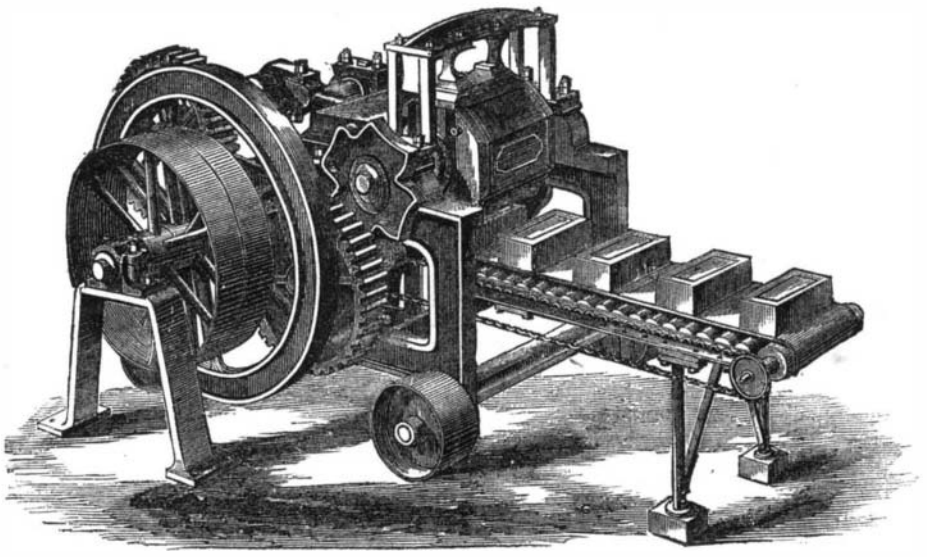
IMPROVED BRICK-PRESSING MACHINE.

We publish herewith an illustration of this machine, by which its construction will be at once understood. The bricks to be compressed, in order to give them a greater density than they acquire in production, are allowed to harden in the air for a few days before being pressed. The machine consists of a sliding block moved to and fro by a connecting rod driven by gearing from the pulley, as shown, and of a revolving barrel containing four chambers, in each of which is fitted a sliding die containing the marks to be stamped upon the brick. The front of the sliding block is also furnished with a stamper. On the top of the machine is a plunger fitting the recesses in the barrel, and moving up and down intermittently by means of the cam shown in the sketch, which is connected to the plunger by means of the four bars shown bolted to the crosshead of the plunger. The action of the machine is very simple. A brick is laid on edge upon a table between the front of the sliding block and the barrel. The sliding block advances and pushes the brick from the table into the recess in the barrel, which is immediately opposite, compresses it, and then retires, leaving the table clear for another brick to be laid on. Meantime the barrel has advanced a quarter of a revolution, carrying the pressed brick with it until it arrives opposite the plunger before mentioned, and this, descending, forces out the brick, which drops upon the endless traveling band beneath, and is carried forward to the taker off. In this way, says *Engineering*, to which we are indebted for the engravings, 10,000 bricks per day can be pressed.



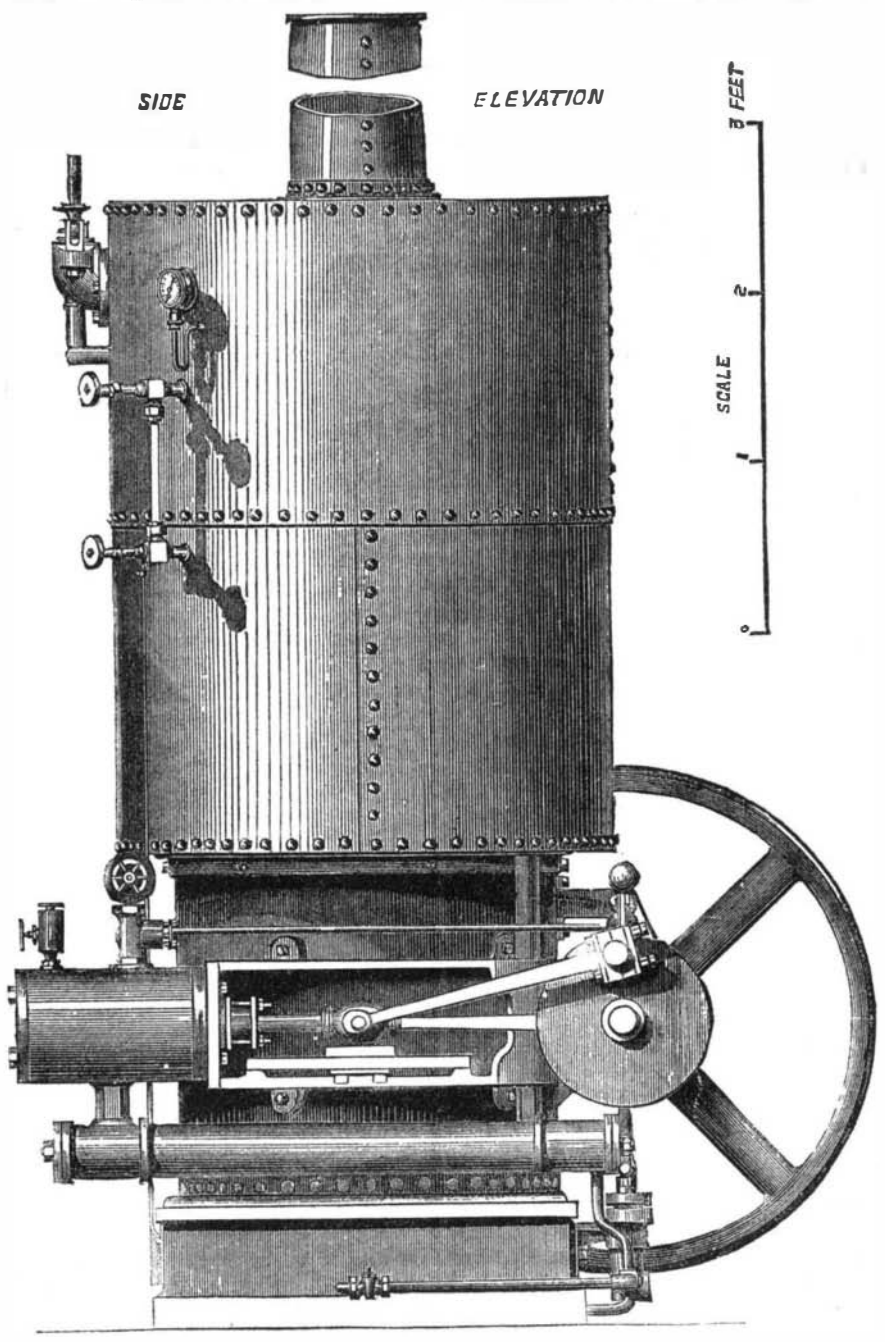
WHITEHEAD'S BRICK PRESS.

The machine was exhibited by Messrs. John Whitehead & Co., of Preston, England, at the recent show of the Royal Agricultural Society at Bedford.

NOVEL ENGINE AND BOILER.

The neat little engine which we illustrate herewith requires scarcely any description to make its construction intelligible. The boiler is fitted with internal vertical tubes arranged in groups of three, secured at each end in malleable cast iron caps, and fixed to the fire box by nuts and bolts. The boiler is covered outside by a sheet iron smoke box, so that lagging is not required, and through this casing all the pipes are led.

The engine, it will be seen, is bolted directly on to the boiler. This is the first instance (says *The Engineer*, from which we extract the engraving), perhaps, in which a horizontal engine has been secured directly to the boiler and not to the base plate; and the arrangement has a good deal to recommend it for small powers, as the amount of space occupied is reduced to a minimum, as is the quantity of material used; and the cost is, of course, diminished accordingly.



HILL AND MASSEY'S THREE HORSE ENGINE AND BOILER.

Ways to Success.

Over fifty years ago, a youth, working on a farm, asked his father to give him money enough to buy a gun. The old man could not spare it, but the boy, nothing daunted, found an old piece of iron about the place, and in the course of time contrived to make a gun barrel out of it, with the very meager facilities afforded by a country blacksmith's shop. He had not the materials to make a lack and stock, so he walked to the nearest town and traded for the necessary attachments, and was encouraged by the smith for having made so good a shooter: this gave him the ambition to make another, so he went to cutting out grindstones from the native rock to raise the money for gun materials; in a short time there was a considerable demand for guns of his make. During the French war with Prussia, he was called upon to furnish guns for the army, and in less than eight months he made and delivered to the government of France rifles of a particular pattern, costing five millions of dollars, which amount was duly paid. The same man furnishes rifles now for the United States, South America, Rome, Spain, Egypt, and Japan. The farmer's boy who wanted a gun is Eliphalet Remington, of Ilion, N. Y. His manufactory covers four acres of ground, and he employs twelve hundred men. Not satisfied with this achievement, he has recently completed a sewing machine, which is reported to represent the latest and most perfect advance in the improvements of this important adjunct of domestic economy. This is the type of a boy who, when there is not a way, makes a way for himself.

Many a youth would have sat down and pouted, thinking over what a hard thing it was that he could not get a gun, with hard thoughts against the father for being so stingy. Not so with young Remington; he wanted a gun and was determined to have it; the very necessities of his situation stimulated him to the exercise and consequent development of his powers of planning and devising; in other words, of thinking for himself. And such are they, the world over, who achieve noted success. Those who think for themselves plan for themselves, and upon themselves lean. So it was with Fitch, and Goodyear, and Howe. Their early history was the history of a struggle with privation, and want, and litigation, and almost despair; and the immortal Morse must be added to the list, owing all to their patience, and courage, and indomitable persistence. If young Remington had been supplied with a gun he would have "gone a-gunning," and fallen gradually into a kind of idle, loafing, aimless life, a burden to himself and a benefit to nobody. The very necessity of effort has been the making of many; while many more, who have had their wants gratified with the asking, have sunk into insignificance, and their name and memory have long since perished from the earth.

Some have been heard to express a wonder that the human family should be permitted by Infinite Benevolence to struggle against poverty and want. But as the human mind is constituted, it is better to struggle than to idle, better to work than to wait; better to lean on one's self than on another. It is the men who, as boys, struggled for a foothold in the world, who now wield the world's destinies, and do the most to mold its history.—*Hall's Journal of Health.*

Printing without a Press.

A photo-carbon print on glass is first obtained in the usual way, says the *Bulletin Belge*, which is then varnished with rather weak gum dammar varnish made with pure benzine. The print should be surrounded then with an edging of mastic varnish, and in the meantime the following solution prepared by the help of the sand bath:—Gelatin, 1 part; gum arabic, 1 part; glycerin, 2 parts; with the least possible quantity of water. This mixture is poured warm on to the carbon print after slightly heating it to prevent the glass from cracking. It should form a thick coating on the top of the image, and when sufficiently congealed the whole is detached from the glass. The mass of gelatin forming the bed of the separated print, as it were, is then placed upon any plane surface at hand, and the image is ready for being printed from. The usual law governing the action of the gelatin matrix causes the ink applied to its surface to adhere where the insoluble gelatin has retained the pigments, and to be repelled where the soluble gelatin still retains its moisture-absorbing properties.

When wishing to print from this image, ordinary lithographer's ink, slightly thick, is taken and thinned with some oil or oil of turpentine, indeed, with any oil except boiled oil. A ground glass large roller is the best to ink with, the ordinary printer's roller producing a stickiness that causes adhesion to the surface of the image and tends to tear it. The roller is covered with ink in the usual way, namely, by working it over an elastic surface, such as a bed of gelatin would be, until the ink is distributed with perfect uniformity. In almost the same manner it is applied to the image until it is sufficiently inked. If over-inked, the surplus age may be removed by a moist rag.

If the ink used be too thick, it will adhere only to the deep shadows, and must be thinned if half tones are to be included. This peculiarity may be utilized either in order to give a greater depth to the shadows of a picture or to obtain prints in different tints at the same time from the same plate. In the former case rollers with inks of different consistence are used, and in the latter rollers covered with different colored inks, also of different viscosity. The plate is inked first with the thickest of these, and so on, the thinner ink refusing to overlay those first applied, and which adhere to the deeper shadows, and only filling in what they leave out. Pictures on a colored ground can thus be easily produced.

The printing is very simply done. A smooth surfaced paper, either glazed or coated with non coagulated albumen, is laid on the plate and pressed down on to it, either by means of an india rubber scraper or a roller covered with flannel. The impression thus taken is carefully removed, and the printing proceeded with in the same fashion as described, only that the plate must be moistened between each impression.

The negative used should be one on which the image has been obtained through the glass in the camera; and if such a plate be not at hand, the carbon print forming the matrix should be taken on stearin paper. This paper is made by placing a sheet of ordinary albumenized paper on a bath composed as follows:—Ordinary alcohol, 3½ ounces; stearin, 3½ drachms; common resin, ½ drachm. Dissolve the stearin in warm alcohol, and add the resin afterwards. A print developed upon this support is then re-transferred to the glass coated with gum dammar varnish.

The facility with which curved surfaces can be printed upon in this way makes it an admirable plan for printing upon vases, etc., with vitrifiable colors; and it is, in fact, a handy plan, if not for commercial photographic printing, at least for trying all kinds of experiments, and one by which amateurs might amuse themselves without much difficulty and at small cost.

Modern Cast Iron.

The Philadelphia *Trade Journal*, in an editorial on improvement in cast metals, recapitulates the advantages gained by the modern scientific manipulation of cast iron, in a concise and forcible manner. In the past 40 years the gross weight of our cast iron articles has been diminished fully one half. Half a century ago the iron frame of a Washington printing press weighed nearly 1,000 pounds; and although it was an arch of metal 9 inches wide by 3 inches thick, so poor was its quality that it was often broken by the pull of one pressman's arm. Our present smooth light castings show an actual elasticity under strain which approaches the service of wrought iron, allowing a large reduction in weight of metal and in the consequent expense.