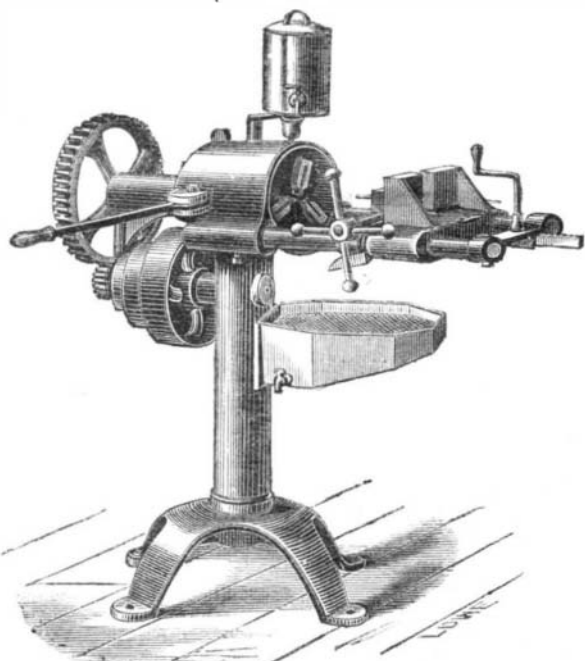


IMPROVED BOLT CUTTER.

The annexed illustrations represent two sizes (Nos. 5 and 6) of a new automatic bolt-cutting machine, recently invented by Mr. E. Schlenker, Superintendent of the Howard Iron Works, of Buffalo, N. Y. The dies revolve, and may be easily removed and others of different sizes substituted, without taking out a screw. When inserted, they become instantly automatically locked. The dies open automatically to receive the bolt, upon which a perfect thread is cut by a single passage through the machine, when other automatic devices cause it to be discharged. The opening of the dies is effected by a gage rod which is set to correspond with the length of thread to be cut.

The smaller machine, illustrated in Fig. 2, may be operated by hand or belt power, and will cut from one quarter inch to one inch and a quarter inclusive. The next size, No. 5½, will cut from three eighths of an inch to two inches inclusive, and the No. 6 machine, which, in the larger engraving, is shown provided with a nut-tapping attachment, operates on from three eighths to three inches, also inclusive. Dies and master taps are furnished with the two machines first mentioned; with the third, the purchaser may order the nut-tapping attachment, and, in addition, as many dies and master taps as he requires. The apparatus is constructed entirely of strong and durable materials, and offers throughout, besides its special features of advantage, a simplicity of construction which will doubtless commend it favorably to mechanics.

Fig. 2.



For further particulars, prices, etc., address the manufacturers, R. L. Howard & Son, Buffalo, N. Y.

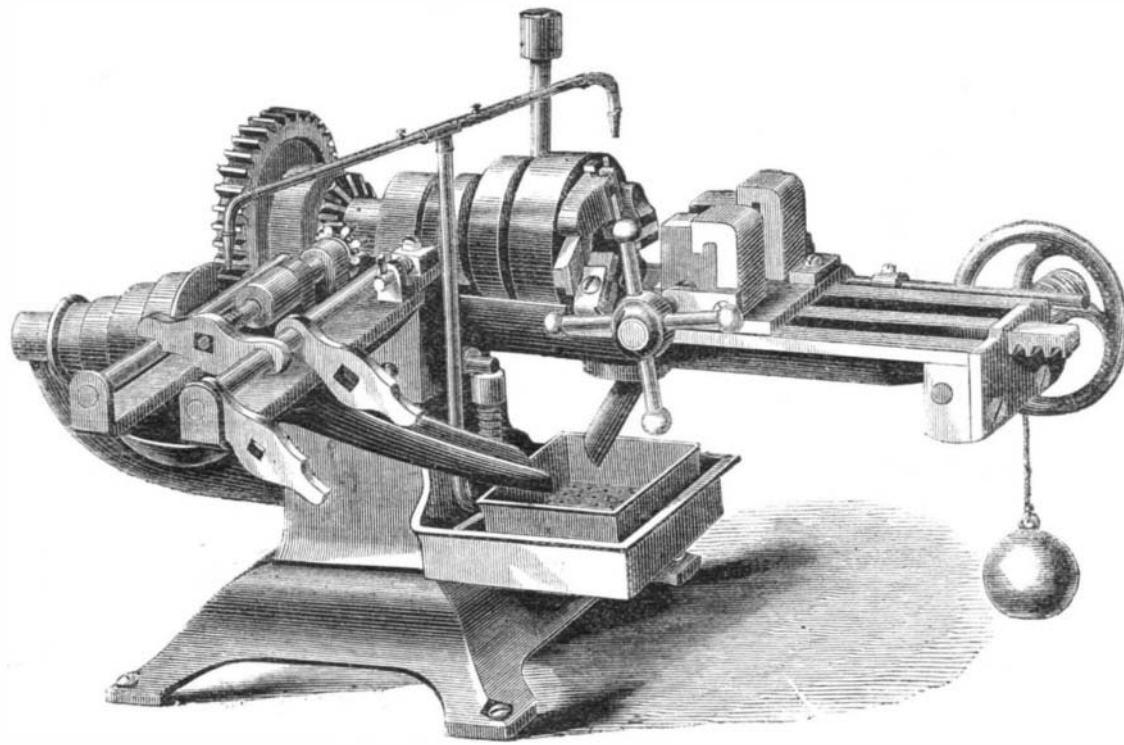
IMPROVED DINNER PAIL.

The construction of the dinner pails in daily use by the millions of working men throughout the country is, it is claimed, open to several objections, not the least of which is that the greater portion of the surface of the receptacle, into which the hot coffee is poured, is within the pail proper containing the meat and other edibles. The latter, by this arrangement, lose their flavor, and acquire an insipid, sodden taste. To remedy this and other disadvantages, the pail represented in the accompanying engraving has been invented by Mr. F. E. Heinig, of Louisville, Ky., who has obtained thereon two patents, one dated in 1873, and the other since the commencement of the present year.

Fig. 1 shows the pail complete as carried in the hand. In Fig. 2, A is a pan (to be used for meat, vegetables, or soup), the upper wired edge of which fits tightly within the lower wired edge of part B. The latter is in section a little over a half circle, and is intended for meat, bread, or pastry. C is the coffee bottle, which also fits over the wired edge of part A, and has a wired bottom describing a little less than a half circle. It has, besides, a simple tin hook on the lower edge of its flat surface, which, catching on the standing edge of the flat surface of part B, holds the bottle firmly in its place. The cover with the cup fits over parts, B and C, and holds them fast together. The size and weight of the pail can be reduced by dispensing with the pan, A, when desired.

Besides the evident lessening of the probability of spoil-

ing the flavor of the edibles (owing to the greater portion of the surface of the coffee bottle being on the outside, and there being two sheets of tin and a thin layer of air between the hot fluid and the contents of part B), the inventor claims the following further advantages for his pail over those hitherto in use: Less chance of the introduction of dirt among the edibles, on account of all the edges fitting outside; greater economy of space; the convenience of separate apart-



SCHLENKER'S IMPROVED BOLT CUTTER.

ments; simplicity of construction, and easy putting together; saving of material in construction, besides the permitting of much greater utilization of scraps.

For further information address the patentee, F. E. Heinig, 89 Floyd street, Louisville, Ky.

Temperature of the Earth.

At the recent annual meeting of the Geological Society of Glasgow, the president, Sir William Thomson, gave a lecture on "The Conditions of Underground Temperature at Different Depths." The various classes of variations occurring, and the mathematical investigations which had been made by various eminent observers of the phenomena referred to, notably those of Fourier, who had done much on the subject of underground temperature, were considered. Such observations were difficult to make with correctness, on account of the changes of temperature caused by the opening of the ground for the placing of the thermometers. The best form of thermometer was that having a long-shaped bulb.

It was found that, generally speaking, the temperature of the earth increased by 1° Fah. for every 50 feet of depth. There were some considerable exceptions to this, the temperature increasing faster, which was apparently due to volcanic action.

By making use of the knowledge acquired by observations and supposing the earth at one time to have been in a molten state, this condition could not be placed further back than about 400,000,000 years.

The Lick Donations.

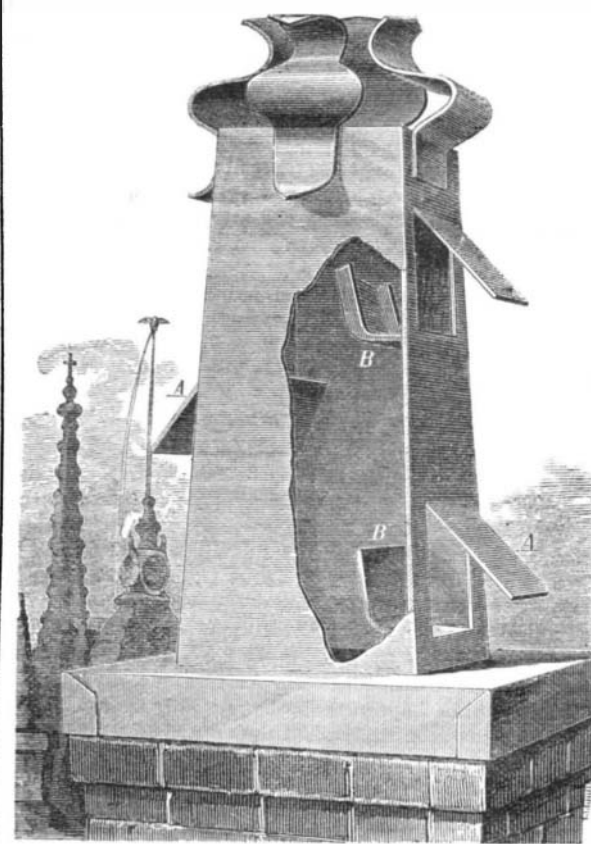
Sometime ago Mr. James Lick, of San Francisco, deeded a large portion of his great estate, in trust for public purposes of an educational and philanthropic character, reserving a modest income for himself. For this good deed he was highly commended all the world round. Now he revokes the trust; and concluding that he has not done justice to his relatives, and that he can carry out his own purposes more satisfactorily, he confirms the steps hitherto taken by the

Among others of his bequests was the sum of \$700,000 for an observatory on the summit of the Sierra Nevada, which all lovers of Science hoped would be accomplished. Alas! how uncertain are both man and riches!

TOMLINSON'S IMPROVED CHIMNEY COWL.

The construction of the new chimney cowl herewith illustrated is such as to prevent currents of air descending the chimney cap in stormy weather, this being effected by suitable provision for imparting an upward impetus to the incoming currents. The flue which constitutes the cowl is secured to the chimney by a flange, and carries above a suitable cap or hood. In the sides are a series of air openings, from the top edges of which, and exterior to the flue, project shields, A, which are adapted to shed water or wind, should the latter tend downwardly. From the lower edges of the air openings extend inwardly projecting deflectors, B, the length of which, as well as of the openings, is less than the diameter of the flue. By this means a space is created beside the ends of the deflectors, as well as between their inner edges, through which the products of combustion can pass and readily escape at the top of the flue. The air openings can be formed on all sides of the flue, or on but two, as in the present instance.

If a current of air strikes the cowl on either side, it will enter through the openings and be turned upward by the deflectors. A suction is thus created within the flue, and the eduction of smoke accele-



rated. If the current enters the flue from above, and tends downward, the deflectors will turn it sidewise and outward.

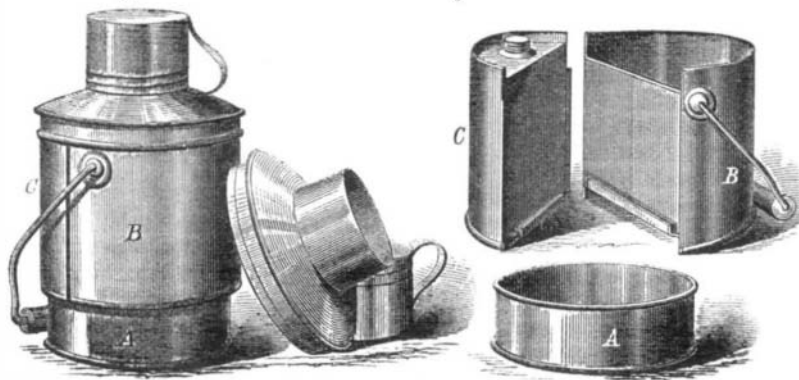
State and county rights for sale. Patented February 9, 1875, to Mr. Joseph Tomlinson, Mount Vernon, N. Y., who may be addressed for further information.

Magnetization.

M. J. Jamin's researches point to an important modification in the construction of magnets. Suppose that a great number of plates, which, after being separately magnetized to saturation, are placed together. The magnetism of the combination will be seen to increase up to a limit which cannot be passed, and which is reached when the polar surfaces are filled. Suppose that ten plates are required. If now we re-commence the same experiment, applying the same plates against two iron armatures of a large surface, the intensities will increase much more slowly, because the sum of the magnetism is diffused over a more considerable extent, and the limit will not be reached till this extent is

Fig. 1

Fig. 2



HEINIG'S IMPROVED DINNER PAIL.

trustees, and resumes possession of his property. The world will be obliged to revoke much of the praise heretofore bestowed on Mr. Lick, unless he shows that his change of mind in this instance does not involve the abandonment of his great scheme of good.

is full. For this it may be needful to superpose twenty, thirty, or forty plates, and, generally speaking, a number so much the greater as the armatures are larger. The total power of the magnet will, therefore, increase with its armatures.