CURIOUS FACTS IN MAGNETISM.

At the meeting of the New York Academy of Sciences February 17th, the article in the March number of *Harper's Magazine*, entitled "Gary's Magnetic Motor," was incidentally alluded to, and Prof. C. A. Seeley made the following remarks: The article claims that Mr. Gary has made a discovery of a neutral line or surface, at which the polarity of an induced magnet, while moving in the field of the inducing pole, is changed. The alleged discovery appears to be an exaggerated statement of some curious facts, which, although not new, are not commonly recognized. If a bar of iron be brought up, end on, near a magnetic pole, the bar becomes an induced magnet, but an induced magnet quite different from what our elementary treatises seem to predict. On the first scrutiny it is a magnet without a neutral point, and only one kind of magnetism—namely, that of the inducing pole. Moreover, the single pole is pretty evenly distributed over the whole surface, so that if iron filings be sprinkled on the bar they will be attracted at all points and completely cover it. Now, if while the bar is covered by filings it be moved away from the inducing pole, the filings will gradually and progressively fall, beginning at the end nearest the inducing pole and continuing to some point near the middle of the bar; the filings at the remote end will generally be held permanently. When the bar is carried beyond the field of the inducing pole it is simply a weak magnet of ordinary properties—*i. e.*, of two poles and a neutral point between them.

A plausible and simple explanation of this case is that the inducing pole holds or binds the induced magnetism of opposite name, so that it has no external influence; the two magnetisms are related to each other as are the positive and negative electricities of the Leyden jar. Let the inducing pole be N.; the S. of the bar will be attracted by it and bound, while the N. of the bar becomes abnormally free and active. On moving the bar from the pole the bound magnetism is released and a part becomes residual magnetism. Now when the residual balances the free magnetism which is of opposite name, we are on Gary's neutral line. In a restricted sense there is a change of polarity over the half of the bar contiguous to the inducing pole; on the other half there is no change of pole in any sense. Experiment with a shingle nail in the place of the filings, *à la* Gary, bring the nail to the induced bound pole, and it may be held, except at the neutral line. Now if one will read the magazine article with such ideas as these he will feel pretty sure that the writer of it has used words recklessly, that Gary has not made an original discovery, and that the "neutral" line, whatever it be, has only an imagined relation to the "principle" of the motor.

The Gary Motor as a perpetual motion scheme, of course, is not worthy of serious notice from a society devoted to science. It has no noteworthy novelty of construction or conception. Mr. Gary is afflicted with the very old delusion of the cut-off or shield of magnetism, which is to cost less than what comes from it. His cut-off is a sheet of iron, which we know acts simply as an armature.

A New Phenomenon in Statical Electricity.

M. E. Duter, in a paper read before the French Academy in December, showed that when a Leyden jar is charged with either positive or negative electricity its internal volume increases, and that this effect is a new phenomenon, unexplainable by either a theory of an increase of temperature or of an electrical pressure. The experiment was performed by means of a flask-shaped Leyden jar with a long tube attached to its neck, and containing a liquid which served as the inner armature. The author's attention had been called to the fact that this phenomenon had been observed ten years ago by M. Gori.

His researches, just made public, leave no doubt of the accuracy of M. Duter's view, that the glass of the jar really expands. According to the theory of elasticity, the effect of an internal pressure in a hollow sphere is in the inverse ratio of its thickness. M. Duter, therefore, had three flasks made of the same volume, but of thicknesses of 4 mm., 0·8 mm., and 0·5 mm. respectively. They were filled with water and enveloped by tin foil. Each carried a capillary thermometer tube, in which the variations of the height of liquid served to measure the changes in volume due to electrification. He found that these changes were imperceptible in the thick glass, very marked in the flask of mean thickness, and rose to 30 mm. in the thinnest. The variations in volume were very nearly in inverse ratio of the square roots of the thicknesses.

A NEW ORE CRUSHER.

The accompanying engravings represent an improved ore crusher, which is said to be very effective and economical in the use of power.

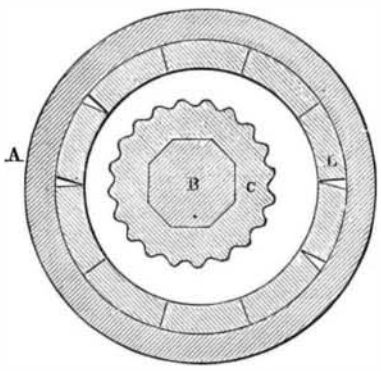


Fig. 2.—HORIZONTAL SECTION.

A short vertical cast iron cylinder, A, having in one side a discharge opening, H, contains all of the movable parts.

The upper portion of the cylinder is lined with chilled iron plates, L, and an inclined chute, X, leads to the discharge opening, H.

A rigid shaft, B, carries the circular crusher, C, and moves in a ball and socket joint at the upper end, and extends eccentrically through the boss of a bevel wheel, G, at its lower end, and rests on a step supported by a lever that may be adjusted by the screw, R. The wheel, G, is driven by the pinion, P, on whose shaft there are a pulley and a fly-wheel.

The double gyratory motion of the crusher, C, causes it to approach all portions of the lining, L, crushing whatever lies between.

It is said that this machine is capable of crushing 10 tons of the hardest ore per hour. Its weight is 6,500 lbs.—*Musée de l'Industrie.*

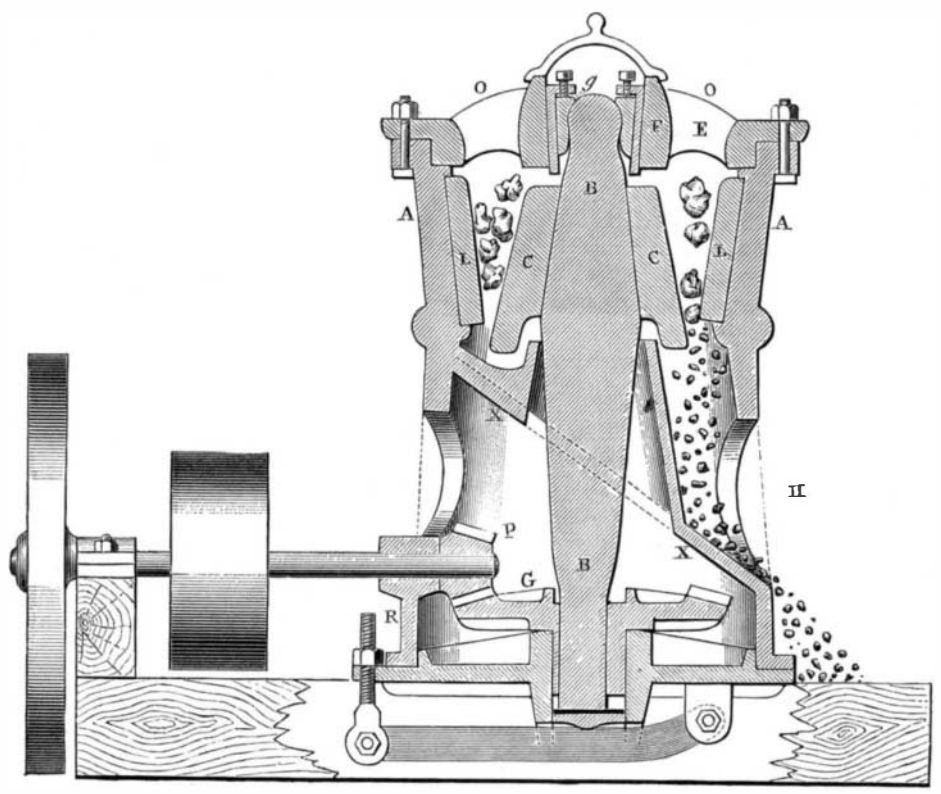


Fig. 1.—BROWN'S ORE CRUSHER.

RECENT AMERICAN PATENTS.

Enos Richmond, of Troy, N. Y., has invented a steak tenderer, having a plunger studded with chisel-pointed rods, and arranged in a case in connection with an elevating spring. A blow upon the knob at the top of the plunger forces the chisel-pointed rods through holes in the casing into the meat, the casing resting on the surface of the steak.

Messrs. A. W. Southard and Volney R. Sears, of Falls City, Neb., have patented an improved invalid bedstead, which is provided with ingenious mechanism for placing the invalid in different positions.

An improved spring attachment for carriage tops, which is designed to prevent the rear bow from being bent by the weight of the top when turned back, has been patented by Mr. Robert E. McCormick, of Doylestown, O.

Mr. Espy Gallipher, of Schellsburg, Pa., has devised an axle journal having a groove lengthwise upon its upper side which extends back upon the surface of the axle and communicates with an oil cup. A sliding rod occupies a portion of the groove; when this rod is drawn out it permits the oil to fill the groove; when it is pushed into the groove in the axle, the oil is ejected and a further supply is cut off.

An improved pill machine, invented by Messrs. W. N. Fort and R. R. Moore, of Lewisville, Ark., is adapted to the manufacture of pills in large quantities. The machine has mechanism for grinding and mixing ingredients, a grooved wheel and trough for forming the pills, and a device for applying powder.

An improvement in millstone adjustments has been patented by Mr. Stephen P. Walling, of South Edmeston, N. Y. This invention consists in a screw applied to the end of the mill spindle on which the stone is rigidly held, so that the running stone may be forced by the screw away from the stationary stone and held against the action of a spring at the opposite end of the spindle, the object being to prevent the stones from becoming dulled by contact with each other.

An improved attachment for sewing machines for soaking or waxing the thread as it passes the needle, has been patented by Mr. Pedro F. Fernandez, of San Juan, Porto Rico. The invention consists in a frame secured to the arm of a sewing machine by a thumb-screw, and provided with a clamping device for holding wax or soap.

A novel combination of a toggle and springs and levers for operating a drag saw has been patented by Mr. Harvey Hughes, of Wheat Ridge, Ohio. The saw, while properly guided, is free to move up or down without affecting the leverage.

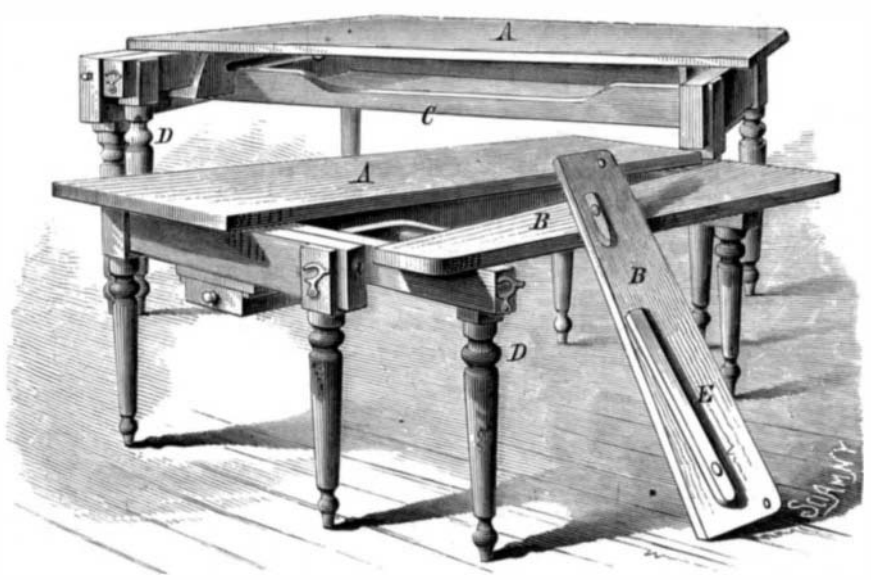
An improvement in filters, which consists in re-enforcing the felt disk with a backing of wire cloth to enable it to resist heavy water pressure, has been patented by Mr. B. P. Chatfield, of Aiken, S. C.

A basket having light sheet metal sides attached to a wooden bottom by crimping the edges over a rib on the periphery of the bottom, has been patented by Mr. Samuel Friend, of Decatur, Ill. The handle and lid may be easily removed to permit of packing and storage.

An improved cross bar for fastening doors, patented by Mr. Richard Condon, of La Salle, Ill., has a spring acted portion which engages a socket on the door casing, and is retained in that position by a spring catch.

A NEW IRONING TABLE.

The accompanying engraving represents a convenient and inexpensive table recently patented by Mr. Albert H. Hogins, of Morrisania, N. Y. It is more especially designed for ironing, but it may be used for other purposes when closed up. The top is made in two tapering sections, A B. The section, B, is narrower than the other, and is pivoted at its wider end to a bar, E, which slides into a socket formed in the table. The table has five legs, one of which, D, is attached to a sliding rail that supports the narrower end of the movable part of the top. The table is provided with a drawer in one end and with a tray, C, for containing blankets, etc.



HOGINS' IMPROVED TABLE.

The convenience and practicability of this table for general laundry use, will be apparent without further explanation. The board, B, when drawn out will be used for ironing skirts, shirts, and other garments requiring a board of this character, and when the table is closed together and fastened by the hooks, it may be used in ironing larger articles. When closed it presents the appearance of an ordinary table and may be used as such.

Further information may be obtained by addressing the inventor as above.