### THE DE MERITENS MAGNETO-ELECTRIC MACHINE.

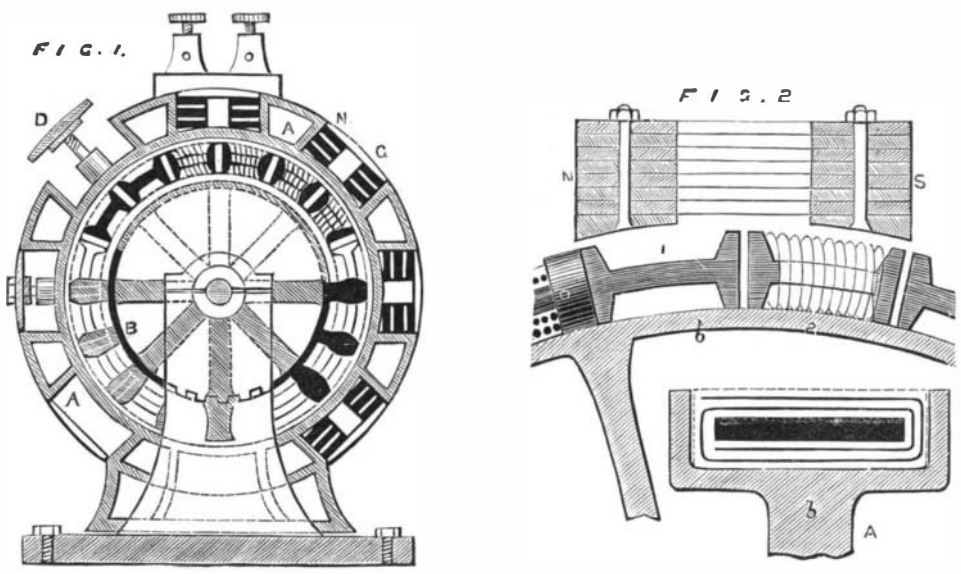
This machine, although not yet before the world in actual use, it is claimed, will effect a great reduction in the amount of engine power required to develop a given current.

Mr. J. T. Sprague, in the *English Mechanic*, says its construction is so simple, and its results so satisfactory, that it seems destined to play a part in the early future.

The machine is really a combination of the principles of the Alliance machine and the Gramme. Several Alliance machines have been converted into the new type.

Fig. 1 shows a front view of the Meritens machine, in which A A is a brass ring, containing recesses to carry compound horseshoe magnets, which are arranged, therefore, at right angles to the radii of the frames, two of which are required to support them. The way in which the magnets are retained in place is shown at *a*, a loose piece completing the arc of the frame being firmly screwed down on the magnets.

The rotating armature of the Gramme machine may be compared to a cart wheel, the tire of which is wound with a wire continuous in itself, but still separated into a series of segments, or arcs of the circle, by means of conducting wires led to a complex commutator on the shaft. The Meritens coil is similar to a Gramme armature, but it is divided itself into a series of segments, separated magnetically by brass pieces, and bound together by means of a brass frame, *b*, shown more fully in Fig 2, as also in section. In Fig. 1 this ring is shown dissected, and it is intentionally drawn a little too small as compared with the outer frame, in the machine, of course, the ring runs as close as possible under the concave ends of the permanent magnets, *n s*. In Fig 2 this is shown more completely, 1 being the iron core, and 2 the same with the wire wound on it, working under the magnet poles, N S. The cross section, A, shows the rim lying on the ring, *b*, by which it is rotated, and to which the segments are secured by lugs corresponding to the expanded ends or poles of the several segments, which are bolted through to these lugs.




THE DE MERITENS MAGNETO-ELECTRIC MACHINE.

The machines at present making have eight permanent magnets. They are arranged to work with three or four of the Jablochkoff candles, and it is claimed that running at 700 revolutions per minute, with three candles in operation, they require only one horse power to drive, all the others under such conditions absorbing three horse power.

One special feature of the machine is that it has no commutator. There are simply two springs, forming the terminations of the wires (being themselves connected to the binding screws) by means of two insulated rings in the shafts, which are connected to the wires; the alternating currents set up in the segments are thus passed direct into the circuit without any loss in sparks, or by the short circuits formed in the ordinary commutators. The construction of the rotating ring combines the actions of the ordinary magneto-electric machines with those of the Gramme. As the ring rotates under each single pole, a succession of molecular magnetic reversals takes place, and the spires of the wire are also traversing a magnetic field, both actions combining, as in the Gramme, to set up a current. As the ends of each segment come under the several pairs of magnet poles a powerful magnetism is induced in the core, which, immediately after, undergoes a sudden reversal, and these actions set up their proper electric currents as in the old-fashioned magnetic apparatus, and as in the Alliance machine. The wires of the different segments are so connected as to act either for quantity or tension, as desired, or could, of course, be collected separately for different circuits. The iron cores are built up out of a piece of sheet iron stamped to the required shape, both for readiness of making and to avoid induction currents in the core itself, and the wire can be wound on nearly as easily as on a common electro-magnet, so that the construction is very simple.

### Various Uses of Paper.

The *Western Paper Trade* sums up the following list of articles manufactured of paper displayed at the recent Berlin exhibition: Animals, washbasins, water cans, carpeting, bonnets, a ship full rigged, lanterns, hats, masks, skirts, clothes, full suits, straps, handkerchiefs, napkins, bath tubs, buckets, bronzes, flowers, urns, window blinds, asphalt roofing, material for garden walks, coral, jewelry, window curtains, shirts, lace, belting, and a house made of pine, but with not only roof, ceiling, cornice, and interior walls of paper, but all the furniture, blinds, curtains, chandeliers, carpeting, ornamented doors, numerous mantel and table ornaments, and finally a stove of asbestos paper burning away cheerfully, and not consuming itself, as it evidently ought to do. All these things indicate some of the possibilities of the adaptation of paper. Who shall say where these possibilities end?

### Tula Silver.

The article manufactured under that name in Tula, Russia, is at present manufactured on a large scale by Zacher & Co., in Berlin, who succeeded in lifting the vail of the secret of its manufacture. Tula silver is a composition of 9 parts of silver, 1 part of copper, 1 part of lead, and 1 part of bismuth. These metals are melted together in the given proportions, and worked with as much sulphur as they may be able to take up. Thus a composition of a peculiar blue color is obtained, which has on that account, in some places, been called blue steel.—*Der Bergmann.*

### Wall Wash.

A new coating for walls has been invented, which consists of a spirituous solution of stearate of soda, prepared in the proportion of 50 grammes of stearate dissolved in 1,000 grammes of spirits of wine, and of a strength of 66 per cent. Other solutions of soap in spirits of wine of more or less strength may be used; but stearate of soda forms the hardest and most impermeable coating, though more expensive. For stables spirituous solutions of common brown soap or soft soap suffice, but the stronger the spirits the better. The solution may be colored with aniline colors, yellow ocher, or dragon's blood. It takes well on wood, lime, or cement. Zinc colors are suitably fixed beforehand, solution of chromate of alum being recommended.

### IMPROVED CRUSHER AND GRINDING MILL.

The utilization of waste is an economy which is practiced more and more as the world grows older. The soil which yields up its constituents to vegetation must be replenished or re-enriched, for it has lost that which is more valuable than gold, and it will not continue to yield without compensation. Agriculturists have, in one way or another, attempted to keep up the standard of productiveness, but have, until a comparatively recent period, for lack of knowledge as to their value and for want of suitable machinery for reducing them to the proper state, neglected the bones, horns, hoofs, and other solid refuse, which have been only a burden and a nuisance, though in reality the best of fertilizers.

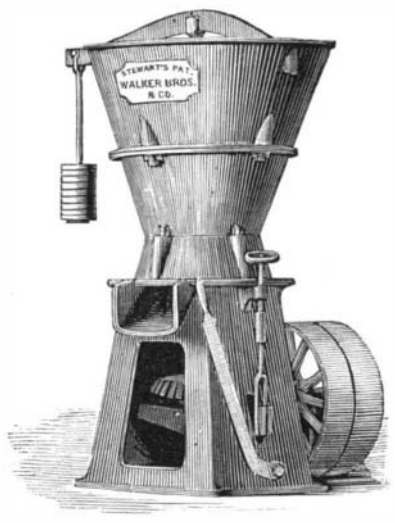



Fig. 1.—CRUSHER.


Fig. 2.—GRINDING MILL.

We give herewith engravings of two machines manufactured by Messrs. Walker Brothers, 23d and Wood streets, Philadelphia, for reducing these waste materials to a usable form, and for other industrial uses.

Fig. 1 is a perspective view of a mill for crushing bones, fire brick, clay, phosphates, and other similar substances. Fig. 2 represents a mill for grinding bones, hoofs, horns, phosphate clay, cement, and such like matters.

These machines are well made and, being wholly of iron, are substantial and durable. They are manufactured under Mr. Wm. Stewart's patents, and are well calculated to give good results.

### New Inventions.

An improvement in Machines for Flaring and Crimping Lamp Chimneys, etc., has been patented by Mr. Charles H. W. Ruhe, of Pittsburgh, Pa. This is a simple and effective adjustable tool for widening the necks of glassware after the same has been formed by blowing in a mould or by hand, and for otherwise ornamenting the edge with grooves or corrugations, notches, or scallops.

Mr. John R. Davis, of Inland, Ohio, has devised an improved Block for the purpose of illustrating the extraction of roots of numbers to an indefinite number of places, and also the involution of any number to any power. The block also admits the demonstrating of roots and powers of proper or improper fractions, common or decimal, and admits in simple manner the explanation of the different steps in extracting roots or involving powers from numbers.

Mr. John J. Ougheltree, of Rondout, N. Y., has patented an improved Music Leaf Turner, of that class in which a number of swinging fingers or arms are placed between the leaves of the music, and successively tripped by the player, so as to quickly turn the leaves. It is provided with a number of pivoted arms or fingers that swing in a vertical plane and are tripped by key levers. The music is clamped to an upright center post of the base, so as to be retained while the leaves are turned.

Mr. Theodore W. Clark, of Oregon City, Oregon, has devised an Automatic Attachment to Fulling Machines, whereby the length of the goods can be ascertained while being fulled, and the amount of shrinkage in length determined without removing the goods from the machine.

A permanent Mould for Casting Sash Weights, which will be available for use at any time, and suited for various sized weights, has been patented by Messrs. Edgar P. Davis and Walter J. Godfrey, of Omaha, Neb. It consists in an iron or steel mould divided in two parts, and constructed so as to be adjustable in length. It is also made with lugs and pins to form the eye for the cord.

Messrs. Ashley W. Holland and Edgar N. McKimm, of Lathrop, Mo., have devised an Animal Trap which is provided with a cover having a grain jacket or chamber at the sides, the latter having a cover of wire gauze.

Messrs. Ole Johnson and John Johnson, of Cresco, Iowa, have patented an improved Car Coupling that couples the cars automatically without exposing the attendants to danger through their stepping in between the cars. The coupling is adapted for cars of all kinds and heights, and may be uncoupled from the side or top of the car.

Mr. William Hinchliffe, of Nashville, Tenn., has patented an improved Door Fastening, which is so constructed that it may be used to fasten the door when closed or when partly open.

Mr. Patrick Gallagher, of Eureka, Nevada, has patented an improved Bench Plane, in which the cutting iron lies flat and makes a smooth cut in the wood. It is more easily adjusted than in the old styles of planes, in which the iron is retained by a wedge piece.

An improved Ticket and Label Holder has been patented by Mr. John H. Mitchell, of Bloomfield, Iowa. This is called a druggist's label cabinet, and is more particularly intended for the use of druggists and apothecaries, for the purpose of keeping labels in order and in place ready for use; but it may be employed as a holder for labels, cards, or tickets for various other purposes.

An improvement in Lanterns has recently been patented by Mr. Eugene Tufts, of Malden, Mass. The object of this invention is to obviate the blowing out of the light by gusts of wind or by a swift movement of the lantern.

An improved Revolving Index for bookkeepers and others requiring the use of an index in their business has been patented by Mr. Lübbe Ulfers Albers, of Keokuk Junction, Ill.

An improvement in Machines for Stretching and Drying Cloth has been patented by Mr Darius Babcock, of Oswego, N. Y. In this invention there is combined with the narrow jointed bar link in common use a wider link, the lower edges of the narrow link resting on stationary pulleys, and the tendency to draw inward caused by the transverse strain placed on the chain while in use being guarded against, and the links guided in a proper vertical position by horizontal flanged pulleys, between the inner faces of which the upper and lower edges of the ordinary narrow link move, and on the adjoining sides or peripheries of which the wide links move, the joints of the links being offset, so as to leave the edges of the same with smooth and unbroken surfaces, against which the pulleys may revolve.

Mr. John Hoerr, or Denison, Texas, has patented a Compact Cooling Attachment for lager beer, ale, and other barrels, by which, with but a small expense for ice, the contents may be kept in a cool state for a long time.