New Inventions.

Improvement in Molding and Shaping Metals.

Iron molding is one of the most universally practiced arts in our country; any improvement, therefore, in any branch of it, is of very general importance, no matter who the inventor may be, nor from whence he hails.

The accompanying figures are illustrations of improvements in molding, for which a patent has been obtained by John Downie, Glasgow, Scotland, and which have been described in the London *Engineer* and Newton's *Magazine*, from which we have obtained our information. The improvement is held to be a valuable one.

This invention relates to a system or mode of molding metals or other materials wherein the pattern has motion given to it during molding, so as to effect the finishing of the surface by mechanical means—leaving nothing to be done by hand on the withdrawal of the pattern from the molds. In cases where the form of the pattern prevents rotation, rectilinear or other motion may be adopted for obtaining the same result; that is to say, for sleeking or finishing the mold and withdrawing the pattern; and in cases where, from the shape of the pattern, the sleeking or finishing cannot be effected by moving the pattern, the rotatory or rectilinear movement may be adopted for merely withdrawing the pattern from the mold.

The invention relates also to the arrangement and manufacture of molding flasks, in such a manner as to form exact counterparts of each other. In carrying this out in practice, the bearing or contact surfaces of the flasks are cast on chill plates, turned in the lathe, planed or otherwise reduced to an accurately regular surface.

In flasks for "pot" and other molding, this invention dispenses with the necessity of using "cheeks" for protecting the partings in the mold. The principle is also applicable to the molding of various materials, such as terra-cotta, encaustic tiles, stucco, and other decorations for buildings, statuary, and ornamental fire-clay work, drainage or sewer tubes in clay or other materials, and, in short, to all classes of molding or shaping metals or other materials where molds are employed.

Fig. 1 is a longitudinal vertical section of a machine for molding three-legged pots, and fig. 2 is a partial transverse vertical section of the same. Fig. 3 is a partial sectional elevation of the core-box, for forming the core for the pot; and fig. 4 is a vertical section of the mold, complete and ready for receiving the molten metal.

The molding apparatus consists of a framing, *a*, fitted with a horizontol plate or table, *d*, upon which the sand to form the mold is rammed in the flask or mold-box, *c*. The pattern lies horizontally in an aperture in the table, which aperture it exactly fills when it is raised to its highest position. This pattern corresponds to the exterior of the pot to be molded, and is formed with a number of rings or collars, *e f g*, extending beyond its rim. The collar *e* is conical, and forms a conical parting surface in the mold to secure the subsequent accurate adjustment together of the core and external portions of the mold. The collars, *f* and *g*, are turned accurately on the faces looking towards each other, to fit a diaphragm, *h*, the lower portion of which is formed upon the framing, *a*, whilst the upper portion is formed upon the framing, *i*, constituting the hood of the apparatus.

The sides of the diaphragm, *h*, are turned or planed to fit the collars. *f* and *g*; and the aperture in the diaphragm through which the pattern piece passes, fits the neck, *j*, between the collars, *f g*, laterally but is elongated vertically to allow of the rising and falling of the pattern. The collar, *g*, is in the form of a cam or eccentric, and rests upon a bearing piece, *k*, capable of accurate adjustment, as to hight, by means of a wedge, *l*, below it. On the front of the collar or cam, *g* is keyed a spur wheel, *m*, which is in gear with a pinion, *n*, carried on a spindle which has bearings in the side of the apparatus, and passes out in front to receive a hand wheel, *o*, by means of which rotatory motion is imparted to the pattern piece. It will be obvious that by turning the pattern piece it will rise and fall according as the projecting or the reverse part of the cam, *g*, comes upon the bearing, *k*.

In figs. 1 and 2, the pattern piece is represented with the projecting part of the cam downwards, and the pattern is consequently elevated to its highest position. Patterns or pieces, *p*, are formed or placed upon the plate, *d*, for the handles of the pot and for the pouring gate, and the sand is rammed into the flask, *c*, upon the pattern, the legs being molded in the usual way by means of loose pieces which are subsequently picked out of the mold. The projecting part of the cam, *g*, is made concentric with the axis of the pattern for a short distance; and on the pattern being turned, after the sand is rammed in, it keeps in contact with the surface of the mold for a short time, whilst the turning action

MOLDING AND SHAPING METALS.

Fig. 1

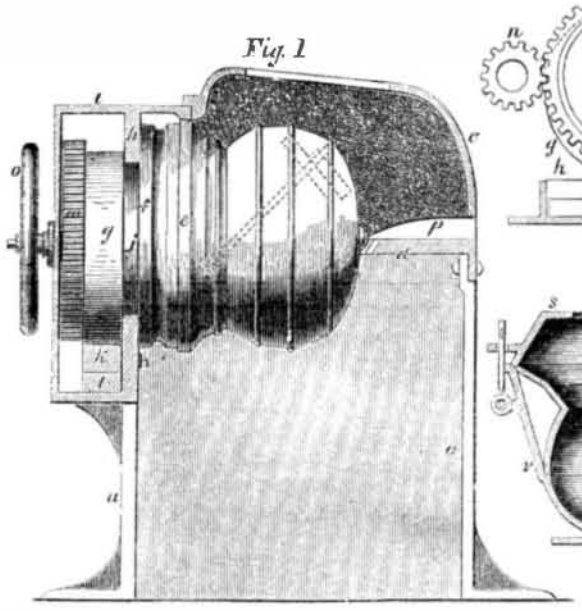


Fig. 2

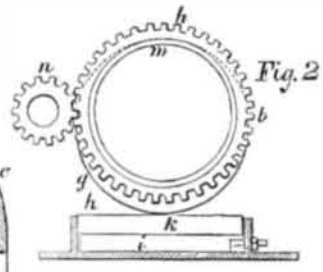
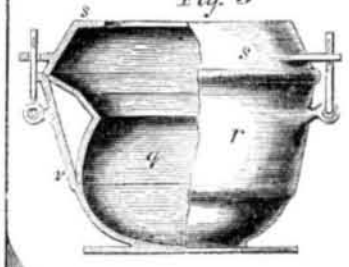
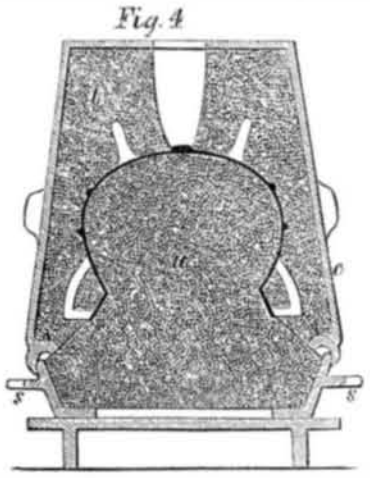


Fig. 3



smooths the surface of the mold. On continuing to turn the pattern, the eccentric part of the cam, *g*, comes upon the bearing piece, *k*, and causes the pattern to be lowered from the mold. When the lowest position is reached, the pattern will be quite free from the mold, and the flask or mold box, *c*, with this portion of mold, may be removed, without danger of injuring the sharpness of any part thereof. The core for the pot is formed in the core box, shown in fig. 3. The indented portions of the core are shaped by two semi-circular pieces, *q*, fitted into the box, *r*, and a conical box, *s*, placed on the top, keeps them in position, and serves to form the base and support for the

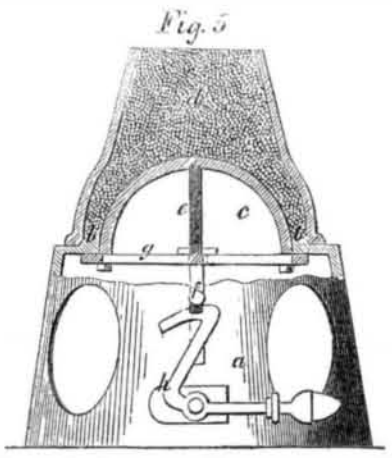
Fig. 4



core, which remains in it when the entire mold is put together in a complete state, as shown in fig. 4. When the boxes, *r s*, are rammed full of sand, the whole is inverted, and the box, *r*, is removed, thus leaving the pieces, *q*, free to be removed laterally. Two half molds, *t*, formed separately by means of the apparatus already described, are placed round and above the core, *u*, (fig. 4,) which completes the mold ready for casting. The outer portions of the mold and the core are made to fit accurately together, not only by the conical surface formed by the shoulder or collar, *e*, (fig. 1,) a surface corresponding to which is formed on the core, but also by means of a check or step, V-formed, at the line of unction of the mold boxes, *c* and *s*.

Fig. 5 is a partial sectional elevation of a modification of the improved molding apparatus, as adapted for molding spherical shot or shell—the apparatus represented being for molding the two halves of the shot or shell. In the arrangement represented, the smoothing action is dispensed with, and a simple rectilinear motion is given to the pattern, to withdraw it from the mold. The apparatus consists of a conical casing, *a*, formed with a horizontal plate, *b*, which, in this instance, takes the shape of a circular rim, with a central circular aperture for the pattern, *c*. The rim, *b*, is turned perfectly true and square to the vertical axis of the pattern, to form the parting surface in each flask, *d*. The junction edges of these flasks are turned to fit each other accurately—one being made to overlap the other, to insure the concentric adjustment together of the two flasks, whilst the plate, *b*, of each molding apparatus is shaped to fit the particular flask for which it is constructed. The pattern, *c*, is supported upon a vertical spindle, *e*, jointed to a lever, *f*, below, the han-

Fig. 5



dle of which lever projects through a slot in the side of the casing, *a*, whilst the lever turns on a center or fulcrum at the opposite side. Two bars, *g*, placed across each other, are attached to the under side of the pattern and are shaped with an edge directed upwards. These edges determine the hight to which the pattern is lifted through the plate, *b*, by coming in contact with the under side of that plate, and are capable of accurate fitting, which is necessary to insure the true spherical shape of the shot or shell. When the molder proceeds to ram up a flask, he lifts the pattern into place by means of the handle, *f*,—a weighted catch lever, *h*, coming under this lever and holding it in position. When the flask is rammed up, the lever, *f*, is released by shifting the catch, *h*, and the pattern is immediately lowered from the mold, and the half mold may then be removed from the apparatus without danger of injuring the sharpness of its parting edges. A rotatory movement may be given to the pattern if desired, either by attaching a lever to its under side to turn it on its vertical axis, or a rim of teeth may be fixed upon it below the plate, *b*,—a pinion in gear with these teeth serving to impart the motion

(*Continued on eighth page.*)

Increasing the Density of Colors.

The colors of velvet—either that of silk or cotton—appear more intense, or "richer" as it is generally termed, than those of any other known fabrics. The cause of this is the greater density of the colored fibers of which the fabric is composed. Flowers are coated with a fine velvety surface, and this imparts to them that superior tone of color, which "Solomon in all his glory" of rich vesture, was unable to rival. Any invention to increase the density of textile fabrics, adds greatly to their beauty. A few years since, T. Mercer, of Manchester, Eng., secured a patent for accomplishing this object in cotton and linen cloth, by steeping such fabrics, in a strong solution of the carbonate of soda. It was stated that Turkey-red colored cloth was greatly improved by this process; and also all other colored fabrics capable of withstanding the action of this alkaline solution. We perceive, by our excellent cotemporary, the London *Engineer*, that another patent has been secured in England for the same purpose, but using a different condensing chemical. The patentee is John McLean, of Glasgow; the condensing substance which he employs is a salt of barium, or calcium (lime,) or strontium. Cotton or flax in any stage of its manufacture—from the raw to the finished state—if steeped for a short period in a solution of any of the above-named salts, and afterwards dried, will be increased in density, and its commercial value thereby increased.

The salt of strontium will be too expensive to use for this purpose, unless its effects are superior to those of the other salts named An increase in the density of any fabric, not only renders its color more intense; but the fabric itself becomes *finer* in proportion as it is condensed, and thereby the very quality of the cloth is as much improved as its color.

Patent Extension.

Joel W. Andrews, of Bridgeport, Pa., has applied for an extension of the patent granted to him March 21, 1843, for an improvement in burning bricks. The petition is to be heard on the 9th of March, at the Patent Office. Persons wishing information in regard to the rules necessary to be observed in opposing this extension must apply to the Patent Office for them.

This invention relates to an improved method of constructing kilns, the walls of which are similar to those now in use; and under the floor of this kiln are flues leading into air chambers, or ash pits, under the grate bars, upon which the fuel is to be placed. The air necessary to combustion is forced into these flues by a fan wheel, or other blowing apparatus.

The claim is for the particular arrangement and combination of the flues, dampers, and fire compartments therein, there being a double flue along the center, from which lateral flues branch off in a curved or angular manner, so as to admit of the employment of dampers in each, in the manner made known.

The Scientific American has boldly denounced the action of the Secretary of the Interior in his attempts to misappropriate the new addition to the Patent Office to other than its legitimate purposes. For our interference to preserve this noble institution to its legitimate uses, we have been deprived of the privilege of receiving notice of applications for the extension of patents, therefore they are only to be found in political journals read by comparatively few inventors and patentees.

New Improvement Wanted for Saw Mills.

A correspondent writing from the interior of this State informs us that a self-feeding apparatus for the steam saw mill is much wanted. The fuel used is saw dust, and the labor of firing it is very severe. He is practically engaged in erecting such mills, and thinks such an apparatus, if it were effective and simple, would make a fortune to the inventor.

Three hundred tuns of tobacco were raised during the past season in the Chemung valley, N. Y. Tobacco is now extensively cultivated in this State.