

S. J. PEET, M. C. POLAND, J. C. POLAND, Jr.  
 & J. W. WILLIS.  
 Molding-Machine.

No. 163,604.

Patented May 25, 1875.

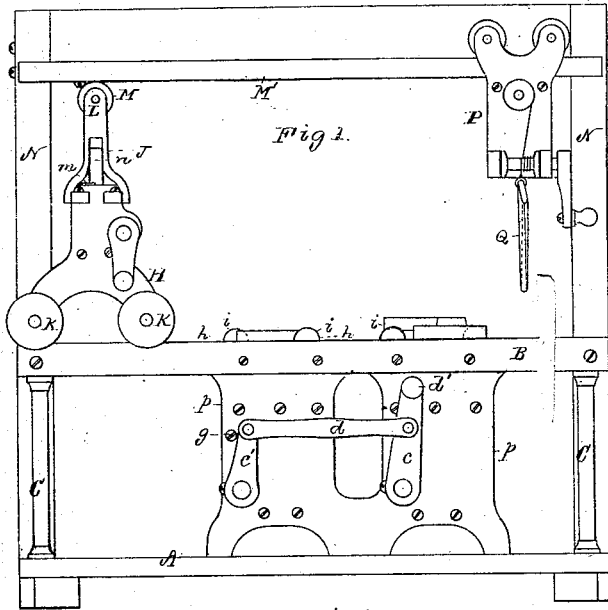


Fig. 1.

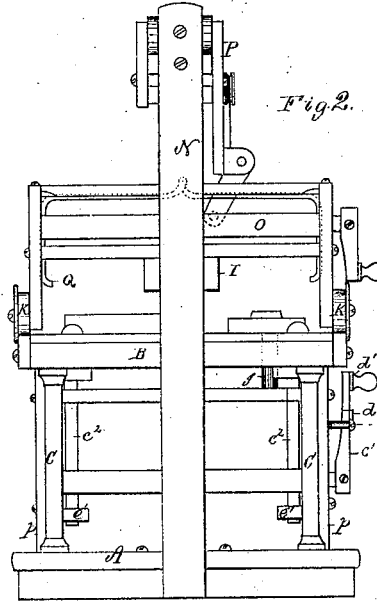


Fig. 2.

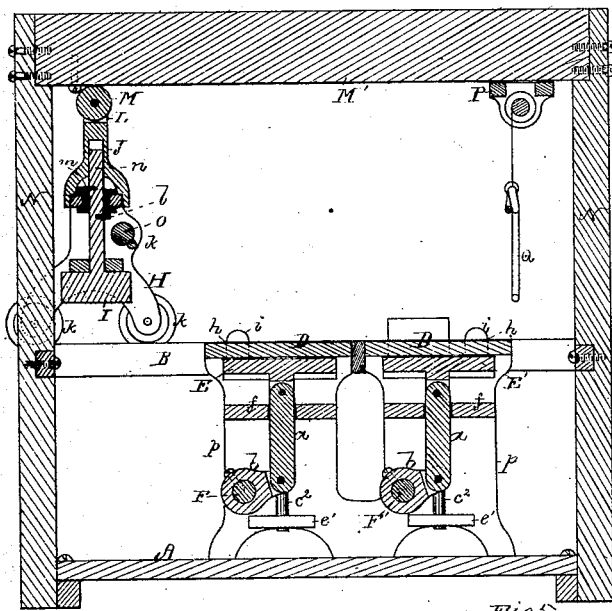


Fig. 4.

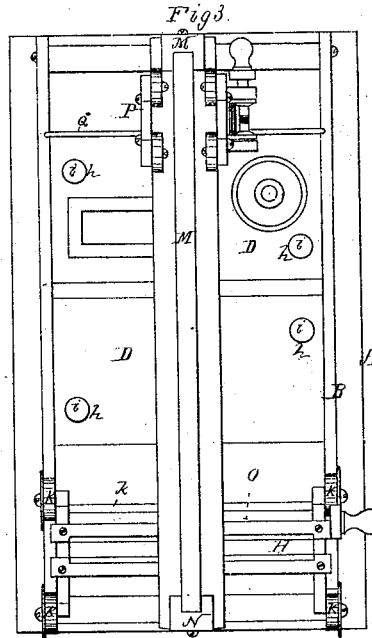


Fig. 3.

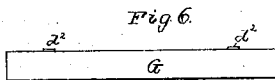


Fig. 6.

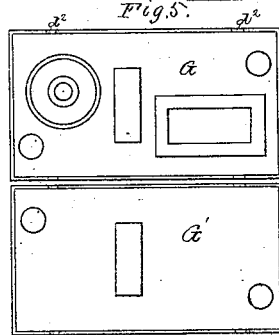


Fig. 5.

Witnesses  
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# UNITED STATES PATENT OFFICE.

SAMUEL J. PEET, MELVILLE C. POLAND, AND JOHN C. POLAND, JR., OF BOSTON, AND JOSEPH W. WILLIS, OF CANTON, ASSIGNORS, BY MESNE ASSIGNMENTS, TO THE PEET MOULDING-MACHINE COMPANY, OF BOSTON, MASSACHUSETTS.

## IMPROVEMENT IN MOLDING-MACHINES.

Specification forming part of Letters Patent No. 163,604, dated May 25, 1875; application filed August 13, 1874.

*To all whom it may concern:*

Be it known that we, SAMUEL J. PEET, MELVILLE C. POLAND, and JOHN C. POLAND, Jr., of Boston, in the county of Suffolk, and JOSEPH W. WILLIS, of Canton, in the county of Norfolk, and State of Massachusetts, have invented certain new and useful Improvements in Making Sand Molds; and we do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

In the said drawings, Figure 1 is a side elevation, Fig. 2 an end view, Fig. 3 a top view, and Fig. 4 a longitudinal section, of a molding apparatus embodying our improvements. Fig. 5 is a top view of the two parts of the flask, representing the sand mold as formed therein. Fig. 6 is an edge view of one of the flasks, showing the leveling-bosses cast thereon.

The object of our invention is to provide a simple, compact, and effective apparatus for the formation of sand molds for metallic castings, whereby not only great nicety of adjustment of the parts of the sand-matrix, when brought together, is attained, but the operation of forming the mold or two parts of the matrix, and then handling, is effected with greater facility and less expenditure of manual labor than heretofore required.

In the said drawings, A denotes the base of the machine. B is a rectangular frame supported on four pedestals, C, extending up from the base A. DD are two templet-plates, which are firmly upheld on supporters or posts *p*, such templet-plates having their top surfaces flush with the upper face of the frame B. E E' are two metallic plates or tables, on which the pattern or parts of the patterns are rigidly secured. These patterns or parts of patterns are so arranged upon their supporting-tables as to be capable of being moved simultaneously up and down through correspondingly-shaped holes in the templet-plates. Each of these tables is connected by means

of a pitman, *a*, and a crank-wrist, *b*, to a shaft, F or F', each of such shafts carrying an arm, *c* or *c'* upon its outer end, the same being connected by a connecting-rod, *d*, the arm *c* being provided with a crank, *d'*, by which the patterns may be simultaneously raised and lowered. The patterns are guided in their vertical movements by cylindrical rods *e*<sup>2</sup> affixed to the pattern-table, and extending down through guides or ears *e'* *e'* affixed to the frame-work, as shown in Fig. 2, the limit of the vertical movements of each of the said pattern-tables being effected by a plate, *f*, disposed below the table, and by a screw or stop, *g*, against which the crank *c'* impinges.

In the said templet-plates the apertures are nicely fitted to allow the pattern, or half of the pattern, to pass through with a joint which will not admit the sand. These holes or apertures I make to fit the pattern, very cheaply, by forming them beveling, and with their upper surface of a size a little less than the patterns, when, by filing the top surface, the same are readily reduced to the required size, and a tight sand-joint made. The same object may also be effected by casting apertures for the pattern a little larger than the pattern—say, one-eighth of an inch—then facing the upper surface of the templet with a thin brass, zinc, or other metallic plate, which can be easily filed. Upon the templet-plates are placed the two parts of the flask G G', known as the cope and nowel. We use a flask two or three times as large as is practical in molding without machinery. These flasks are to be made of iron. To save the great expense of fitting up these large flasks by planing both surfaces, as is usually done, we cast three or four bosses or projections, *d*<sup>2</sup> *d*<sup>2</sup>, &c., on the face side of each semi-flask, which is to rest on the planed surface of the templet-plate. In fitting these parts of the flask to produce the requisite joint, we place the semi-flasks with their bosses upon their respective templet-plates, when, by looking along the surface of the templet-plate, we can readily see how much is to be filed off to bring the parts into parallelism.

On each of the pattern-carrying plates, at

convenient points to accommodate the pattern, we place two rods, *h h*, having semi-spherical ends *i*, the same being to form semi-spherical cavities in the two parts of the sand matrix. Within the nowel or lower half of the flask we place two spherical balls, having the same size of the cavities above mentioned, so that when the two parts of the flask are brought together, the balls of the nowel, entering the cavities of the cope, serve to bring the parts of the flask into perfect coincidence without the use of pins, as now usually employed, and which are liable to become worn and loose, and thereby fatal to good casting.

By thus constructing the sand matrix with the semi-spherical cavities, as described, and the employment of the spherical balls, absolutely perfect guides are secured, as at each casting, the sand matrix is always new.

In making castings requiring straight cores, such as washers, couplings, &c., we place a rod or rods, *j*, of iron, having the same diameter of the required cores upon a support underneath the templet-plate, allowing the upper end of the rod to stand on a plane level with the surface of the templet-plate, so that when the pattern or patterns are depressed below the templet-plate the cores will rest on the ends of these rods, thus saving all risk of drawing the cores, which is always more or less in green-sand cores, such green cores being much better, as well as cheaper, than dry-sand cores. This same general principle applies in making those castings, which, like flask-castings, would cut the templet-plate in two or more parts. We have only to give each part of our templet some support underneath to rest on, and we can draw our pattern from the sand without any trouble.

In order to compact the sand in each half of the flask, we mount upon the frame B a carriage, H, provided with one or more rams, I, whose length corresponds to the width of the flask. The ram or rams are affixed to a head-stock, J, so as to be capable of being moved laterally the entire length of the flask. This carriage is mounted upon wheels K, which run upon the top of the frame B, or ways formed on the same, and is maintained in direct impingement with the rails by means of an arm, L, carrying a friction-wheel, M, which runs against a horizontal bar, M', affixed to the vertical posts N N. The ram I is so applied to the head-stock as to be capable of being alternately raised and lowered. This is effected by means of a wiper, *k*, disposed on the cranked shaft O, acting against a tooth or projection, *l*, on the shank or stem of the ram.

When placing the flasks, or taking them

off the table or templet-plates, the ram or rams are to be raised and held out of contact with the flasks. This is effected by means of a pin, *m*, passing through the stem *n* of the ram. When not in use the ram-carriage is to be run back into the position shown in the drawings.

For the purpose of easy handling our flasks, we dispose above the templet-plates, and on the top bar of the frame, a carriage, P, which runs on ways formed on the frame. This carriage is provided with two windlasses, a crank, and pulley, and bale Q, by which the flask may be moved as circumstances may require.

When both semi-flasks are filled and molded, we place the bottom-board on the nowel, and secure it in the ordinary manner. We next fasten the bale of our hoisting apparatus to the trunnions or holes of the wheel, and next carefully raise it sufficiently to turn it over, face side up, upon its templet-plate. We next place our dry sand cores in positions in the sand-matrix. We next run the hoisting apparatus over the cope, and affix the bale, as before, and raise it (the cope) up sufficiently to turn it edgewise, so that we can examine it in this position. It can then be safely moved over the nowel, on which it can be lowered with much greater safety than by the ordinary mode. We next attach the hoisting apparatus to the trunnions in both parts of the flask, when it can be safely and easily taken by one man to any part of the foundry, and placed in position for claspings.

Having described our invention, what we claim is—

1. In a machine, substantially as described, for making sand molds for castings, the combination of the two templet-plates, the patterns, the semi-flasks, and a carriage movable horizontally, and provided with a ram capable of having compound or vertical and horizontal movements, the whole being constructed and arranged to operate substantially as set forth.

2. The semi-flasks when formed with projections or bosses  $d^2$   $d^2$ , &c., as and for the purpose set forth.

In testimony that we claim the foregoing as our own invention we affix our signatures in presence of two witnesses.

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JOHN C. POLAND, JR.  
JOSEPH W. WILLIS.

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