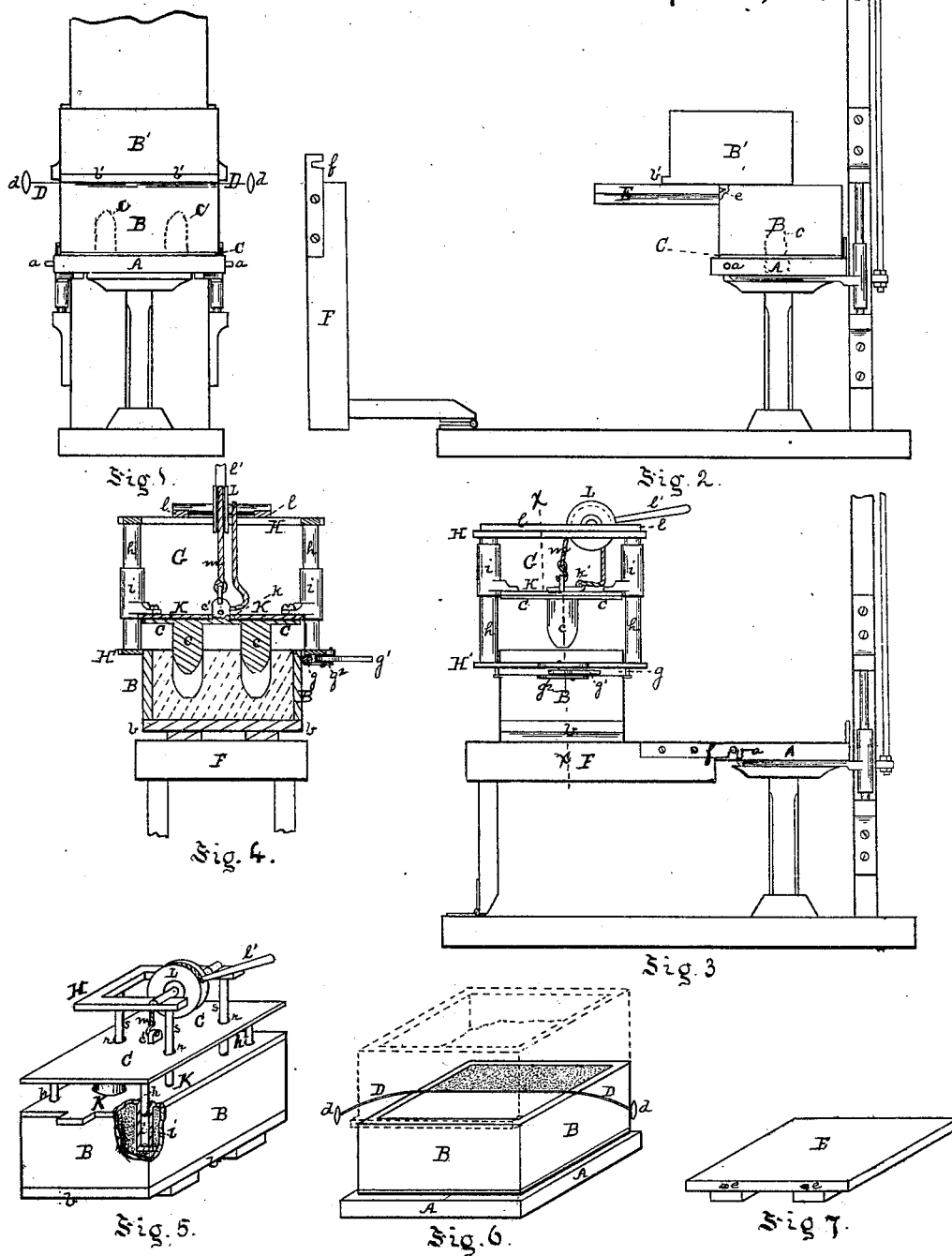


S. J. ADAMS.
Apparatus for Withdrawing Pattern from Mold
for Casting.

No. 213,964.

Patented April 8, 1879.



Witnesses

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IMPROVEMENT IN APPARATUS FOR WITHDRAWING PATTERNS FROM MOLDS FOR CASTING.

Specification forming part of Letters Patent No. 213,964, dated April 8, 1879; application filed January 28, 1879.

To all whom it may concern:

Be it known that I, S. JARVIS ADAMS, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Apparatus for Forming Molds for Castings; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a face view illustrating part of my invention. Figs. 2 and 3 are side views. Fig. 4 is a sectional view through the line *xx*, Fig. 3. Fig. 5 is a perspective view, showing one form of apparatus for withdrawing the pattern. Fig. 6 illustrates the method of cutting off the mold; and Fig. 7 is a view of the reservoir bottom-board.

Like letters of reference indicate like parts in each.

My invention relates to apparatus for forming molds in sand for making iron, steel, and other metal castings. Heretofore much difficulty has been experienced at different stages in the formation of these molds, among which the following have been particularly noticed: Where a reservoir was used in forming molds, either by jarring or pressing, it has been exceedingly difficult to cut the sand so as to separate the flask and reservoir evenly, and it has been found necessary to smooth or level off, and in some cases to fill in and ram, the mold after the reservoir has been removed. It has also been found almost impossible to withdraw the pattern from the mold by hand without to some slight degree marring the mold, which was very objectionable in molds for long cylindrical castings, such as pipe-plugs, wagon-boxes, &c., rendering it necessary to turn the castings before use.

The object of my invention is to overcome these objections, and to improve the apparatus used for forming molds in other particulars.

It consists, first, in separating the sand of the mold from the extra sand in the reservoir by means of a wire drawn between the flask and reservoir, thus cutting the sand; second, in apparatus for withdrawing the pattern, which is adapted to be placed upon and supported by the flask after the formation of

the mold, and is provided with suitable lifting mechanism for withdrawing the pattern; third, in a hinged swinging platform adapted to be connected to and used with the molding-table; and, finally, in other details of construction hereinafter specifically set forth.

To enable others skilled in the art to make and use my invention, I will describe its construction and operation.

In the drawings, A represents the molding-table, which may be arranged to form the mold by jarring, as shown, or by pressing, or in any other convenient way. The pattern or patterns *c* are attached to the pattern-plate C, which is placed on the molding-table A, and the flask B is placed over it, so that the patterns extend up into the flask. The connecting-lug *c'* of the pattern plate fits into a recess in the molding-table. The reservoir B' is then placed on the flask, and the mold formed in the usual way.

D is a separating-wire, which is of small gage, so as to cut easily, and is provided at each end with a handle, *d*, by means of which it is held when used by the workman. After the mold is formed the wire is placed back of the flask and drawn through between the flask and reservoir, as shown in Figs. 1 and 6, being operated by the handles *d*, thus severing the sand of the reservoir from that of the mold, so that the reservoir may be slid off and leave an even surface to the mold. As the wire is held taut and is guided in its movement by the edges of the flask, it cuts the surface perfectly true with the flask, and leaves an even surface on the mold, which needs no leveling off or filling in when the reservoir is removed.

After the separation of the sand in the reservoir and flask the reservoir is removed by placing the reservoir bottom-board E against the flask B (its upper edge fitting under the guiding-strip *b'* on the reservoir and the teeth *e* pressing into the flask) and sliding the reservoir onto the board E, as shown in Fig. 2. The guiding-strip *b'* is even with the bottom of the reservoir, so that it will slip onto the board without spilling the sand, and the teeth *e* hold the board in place during the operation. Instead of these teeth any suitable catch may be used on the board E.

When the reservoir is again needed it is

slipped from the board E onto the flask in the same manner.

F is a hinged swinging platform, which it is found desirable to use during part of the operation of forming the mold, and which is hinged to the floor or frame of the machine in such position as to be swung entirely out of the way when not in use, as shown in Fig. 2. It is provided with hooks *f*, which catch on the lugs *a* on the molding-table A, and connect it with the table, so as to form part thereof. After the reservoir is removed the platform F is swung over and connected with the molding-table, as shown in Fig. 3, and the bottom board, *b*, is then placed on the mold, and the mold turned over, so as to bring the pattern-plate C on the top of the mold.

The pattern-plate C is removed from the mold by improved apparatus, which is supported by the flask, being either attached to it by clamps or other suitable fastenings or resting directly on the flask. G illustrates one form of this apparatus, which is attached to the flask by means of a clamping-bar, *g*, at one end of the apparatus.

The pattern-removing apparatus has the upper and lower frames, H H', connected by the uprights *h*, the lower frame fitting around the flask, which passes up through it. Upon each of the uprights *h* are the guide-sockets *i*, carrying the guide-plate K within the frame, said plate being so attached as to be at right angles to the uprights and to lie horizontal when the uprights are perpendicular. The guide-plate, with its guide-sockets, is capable of vertical movement within the frame, the sockets sliding on the uprights.

In the center of the plate K is formed the opening *k*, through which the connecting-lug *c'* on the pattern-plate C passes. Mounted on suitable supports *l*, on the upper frame H, is the lifting-wheel L, provided with the handle *l'* and a chain or cord, *m*, at the end of which is attached a hook or other suitable connecting device. The wheel L is mounted in such position that the chain or cord *m* hangs directly over the central opening, *k*, of the guide-plate. At one end of the apparatus, below the lower frame, H', is the clamping-bar *g*, which is advanced and retracted by means of the eccentric pivot-rod *g'*, so as to be forced against the flask when it is desired to attach the apparatus to it. The clamping-bar *g* is supported in position and guided in its movement by the lugs *g''*, attached to the frame.

When this apparatus is used it is placed over the flask containing the pattern and mold until the guide-plate K rests upon the pattern-plate C, and the pin *k'* is passed through a hole in the connecting-lug *c'*, which extends up through the central opening, *k*, thus fastening the two plates firmly together. The clamping-bar *g* is then forced against the flask by the pivot-rod *g'*, fastening the apparatus rigidly to the flask. The hook at the end of the chain *m* is caught in the lug *c'*, and the two plates are raised vertically by means of

the wheel L and handle *l'*, being guided in their movement by the sockets *i* on the perpendicular uprights *h*.

As the guide-plate K and pattern-plate C are parallel and are firmly connected, it is evident that the patterns will be drawn from the flask in a direct line without sagging in any way, and will leave a perfect mold in the sand.

During the operation of withdrawing the pattern the apparatus used is supported on, and the pressure or force by which the pattern is lifted out is sustained by, the flask. The apparatus may be removed by loosening the clamping-bar, the pattern-plate removed therefrom, and the molding continued as before described.

In Fig. 5 is shown another form of apparatus for withdrawing the pattern, in which the parts are arranged somewhat differently. Instead of hanging the guide-plate within the frame, it is placed on top of the flask between the pattern-plate and flask, as shown at K, and is provided with the guide-sockets *i*, which project into the flask, and into and within which guide-rods *h* on the pattern-plate C fit and work. The patterns *c* pass through openings in the plate K of the shape of the patterns and project into the flask. These guide-rods *h* on the pattern-plate serve to guide the plate when being removed in the same way as the uprights *h* in the apparatus heretofore described. Through the plate C are three or more openings, *r*, through which the supports *s* of the lifting-frame H pass. The flask is placed on the plates C and K, and the mold formed, the reservoir removed, and the flask turned over, as above described. The lifting-frame H is then placed on the plate, the supports *s* passing through the openings *r* in the pattern-plate C, and resting on the stripper or guide plate K, the chain or cord *m* connected with the lug *c'* of the pattern-plate, and the pattern-plate lifted by the movement of the wheel L, as above described, the pattern-plate being guided in its movement by the guide-rods *h* in the tubular guide-sockets *i*, and the patterns *c* rising through the openings in the guide stripper plate K. In this operation the plate K rests on the flask, and the pressure or force by which the pattern is lifted is sustained by the flask through the plate K. After the removal of the plate C the plate K may be lifted off in the usual way, the extensions or sockets *i* guiding it in its movement.

The following are some of the advantages of my improvement: The mold is cut off evenly when the reservoir is removed, rendering it unnecessary to fill up and ram or level off the surface. The apparatus for removing the pattern is accurate, simple, convenient, and cheap. It can be used whether the pattern-plate is perfectly parallel with the under surface of the mold or not, as it is only essential that the guide-plate and pattern-plate are parallel, and it always draws the pattern in a direct line at

right angles to the pattern-plate itself, thus insuring a perfect mold.

It is evident that another mechanism for withdrawing the plate equivalent to the wheel and chain may be adopted; also, that the pattern may be used without the plate and directly connected to the guiding mechanism.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In combination with the flask and reservoir, the separating-wire D, adapted to be drawn between the flask and reservoir, substantially as and for the purposes set forth.

2. In apparatus for withdrawing the patterns from molds, the removable lifting-frame, adapted to be placed upon and supported by the flask after the formation of the mold, and provided with suitable lifting mechanism, to be connected to the plate carrying the patterns, and to withdraw them from the mold, substantially as and for the purposes set forth.

3. The combination of the lifting-wheel for withdrawing the pattern, mounted on the removable frame H, adapted to be placed upon and supported by the flask after the formation of the mold, the pattern-plate C, the guide-plate K, provided with the guide-sockets i and suitable guides h, substantially as and for the purposes set forth.

4. In combination with the flask, the removable lifting-frame, placed upon, supported by, and provided with a clamp, g, for securing it to the flask after the formation of the mold, and the horizontal guide-plate K, mounted in the frame on the perpendicular uprights h, and adapted to rest upon and be so secured to the pattern-plate as to hold it parallel therewith

when the pattern-plate is removed from the mold, substantially as and for the purposes set forth.

5. In combination with the flask, the removable lifting-frame placed upon, supported by, and provided with a clamp for securing it to the flask after the formation of the mold, the guide-plate K mounted in said frame on the uprights h, suitable means for attaching the guide-plate to the pattern-plate or pattern, and the lifting-wheel for withdrawing the pattern, substantially as and for the purposes set forth.

6. The combination of the pattern-plate C, provided with the lug c', the guide-plate K, pin k', lifting-wheel L, and chain or cord m, substantially as and for the purposes set forth.

7. In apparatus for withdrawing the patterns from molds, the lifting-frame H H' h, provided with the clamping-bar g and pivot-rod g', substantially as and for the purposes set forth.

8. The combination of the reservoir B, provided with the guiding-strip b', reservoir bottom-board E, having the teeth e, and the flask B', substantially as and for the purposes set forth.

9. The combination of the molding-table A and the hinged swinging platform F, adapted to be connected to the table, substantially as and for the purposes set forth.

In testimony whereof I, the said S. JARVIS ADAMS, have hereunto set my hand.

S. JARVIS ADAMS.

Witnesses:

F. G. KAY,

JAMES I. KAY.