S. J. ADAMS.

Sand-Molding Machine.

No. 211,488. **Patented Jan. 21, 1879.**

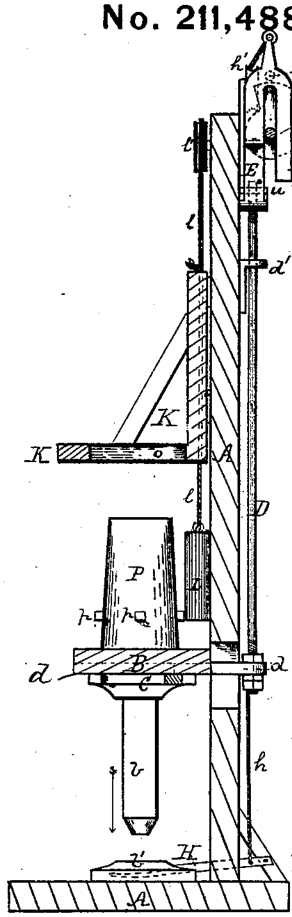

Fig. 2.

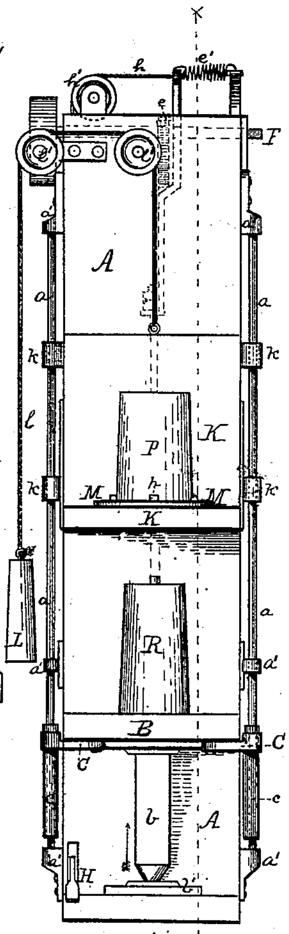

Fig. 1.

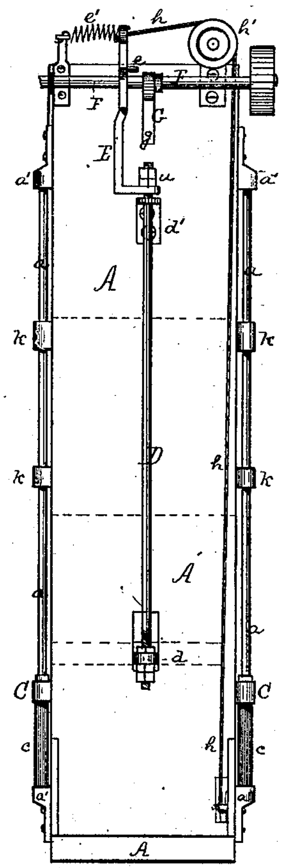

Fig. 3.

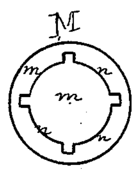

Fig. 5.

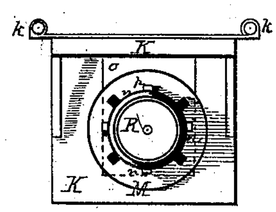

Fig. 4.

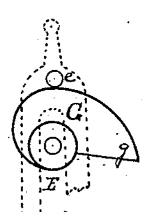

Fig. 6.

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2 Sheets—Sheet 2.

S. J. ADAMS.

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Fig. 7.

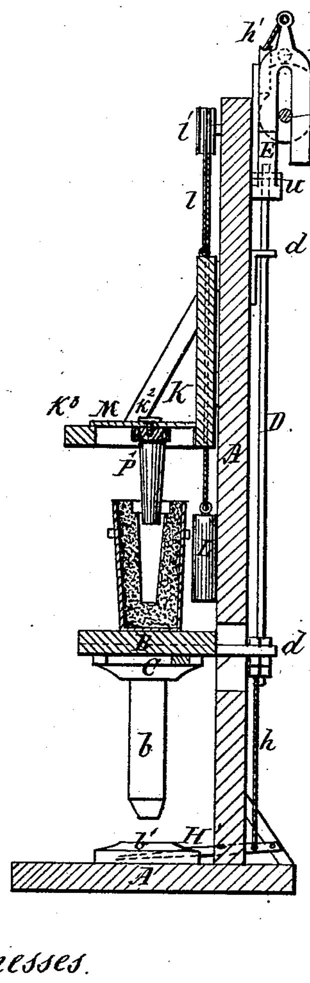
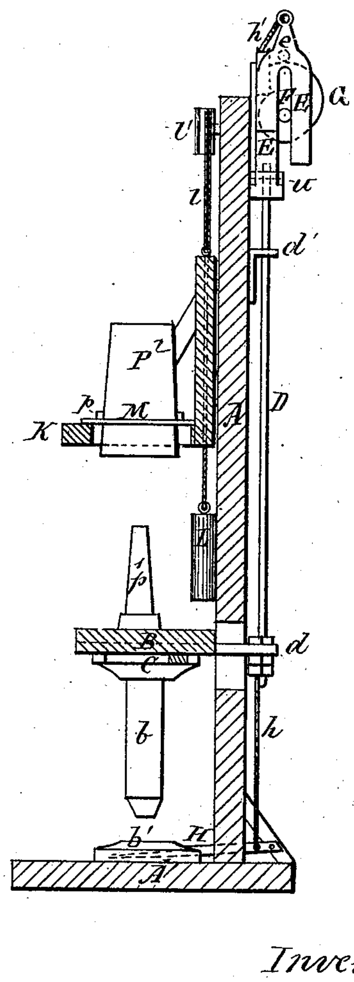


Fig. 8.



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UNITED STATES PATENT OFFICE.

S. JARVIS ADAMS, OF PITTSBURG, PENNSYLVANIA.

IMPROVEMENT IN SAND-MOLDING MACHINES.

Specification forming part of Letters Patent No. **211,488**, dated January 21, 1879; application filed May 4, 1878.

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 and Cores; 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 of my improved apparatus. Fig. 2 is a sectional view through the line *x x*, Fig. 1. Fig. 3 is a rear elevation. Figs. 4 and 5 are views of the plate and lifting mechanism for removing the flask from the mold, and Fig. 6 is a side view of the cam. Fig. 7 is a vertical section, showing means for lifting a pattern from a mold; and Fig. 8 is a similar view, representing a core-box lifted from a core.

Like letters of reference indicate like parts in each.

My invention relates to certain improvements in apparatus for forming molds and cores by the jarring process, and removing the flasks or core-boxes from the finished molds or cores; and it consists, first, in combining with the jarring-table, upon which the molds and cores are formed, a certain cam mechanism, by means of which a regular and even jar is imparted to the table; and, second, in a vertically-sliding platform arranged above the table and working on suitable guides on the frame, by means of which the pattern flask or core-box may be lifted from the finished mold or core without marring or injuring the same as it is withdrawn.

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

In the drawings referred to, A is the stand or frame upon which the jarring apparatus is mounted. At the side of said frame are the perpendicular guide-rods *a*, which are attached thereto by means of the supports *a'*, and are polished to allow the different parts of the apparatus to move smoothly upon them. The jarring-table B is mounted in front of the frame A at any height desired by the workman, according to the class of work to be made, and is provided with the bar *b*, which strikes upon the weight or block *b'* in the floor, thus imparting the jar to the table.

The braces C are mounted on the guide-rods *a*, and extend underneath and are attached to the table, supporting it in a horizontal position. These braces are provided with the sockets or sleeves *c*, which work on the rods *a*, and are made long, so as to give greater strength and hold the braces and table perfectly horizontal, overcoming any tendency of the table to sag out of true level by the weight placed upon it.

The table B is provided with the arm *d*, extending from the center of the back of the table through a slot or opening in the frame A, where it is attached in any suitable manner to the perpendicular lifting-rod D. This rod works in suitable bearings *d'*, and has attached to it the slotted rod or plate E, which fits over the driving-shaft F, running along the upper part of the room, the shaft working in the slot in the rod.

The top of the lifting-rod D passes through the base of the slotted rod E, and is connected thereto by means of the nut *u*, the rod E working loosely on the rod D, so that it may be thrown in connection with the cam G without changing the position of the rod D.

On one side of the rod or plate E is the lug *e*, and attached to the top of the plate is the spiral spring *e'*, which is connected with the frame A or other suitable place.

Rigidly attached to the shaft F is the cam G, which revolves with the shaft, and is of a gradually-increasing diameter or lift from the hub until the highest point, *g*, is reached, when it is cut off straight to the hub, so that when the jarring mechanism and cam are connected it will lift the jarring-table gradually until it reaches the top, and then permit it to drop on the weight.

The distance of the drop of the jarring-table may be regulated by the size of the cam used.

At the base of the frame is the foot-treadle H, extending through to the front in convenient position for the workman to operate it with his foot. This treadle H has the cord *h* attached to it, which passes over the loose

pulley h', and is connected to the slotted plate E, and by means of which the lug e is drawn over the cam and the lifting or jarring mechanism connected therewith.

The shaft F is operated by steam or any suitable power.

In front of the frame A, above the table B, is the sliding platform K, which is so journaled on the perpendicular guide-rods a, by means of the socket-arms k, that it can be raised and lowered thereon.

The platform is counterbalanced by the weight L, which hangs at the side of the platform, and is connected thereto by the cord l, passing from the top of the platform over the loose pulleys l' l'.

The base of the platform is made open, as shown at o, and is on a true level, corresponding to the level of the jarring-table B.

Resting on the platform K, above the opening o, is the lifting-plate M, which may either rest on it loosely, or be so attached as to turn thereon.

The plate M has the opening m formed in it, through which the flask passes, and suitable slots extending from said opening for the passage of the lugs on the flask, thereby forming the lips n, which catch under the lugs on the flask.

P represents the flask or core-box, and R the mold or core formed therein.

The flask has three or more lugs, p, upon the sides thereof, under which the lifting-plate catches when it is desired to remove the flask from the mold.

The operation of my improved apparatus is as follows: The flask or core-box P and its appropriate sand-reservoir are placed upon the jarring-table and filled with sand. The foot is then placed upon the treadle H, which draws down the cord h over the pulley h', and draws the lug e on the slotted plate E over the cam G, and thus throws the table B in connection with the power. The revolving cam G then gradually raises the slotted plate E by the lug e, and with it the rod D and table B, until the highest part g of the cam passes the lug, when it permits it to drop, and with it the table B, until the bar b strikes the weight b', thus imparting the jar to the table and the flask thereon. The jarring of the sand in the flask packs it around the pattern and forms the mold. As the cam again revolves, it lifts the jarring mechanism by the lug e repeating the operation. When the table has received a sufficient number of jars to form the mold—say, from twenty to forty, according to its size and shape—the foot is lifted off the treadle, and the spring e' draws the lug off the cam, as shown in Fig. 3, and thus frees the jarring mechanism from the cam. The reservoir is then lifted off, and after the finishing of the mold or core the lifting-platform K is drawn down over the flask P, and the lifting-plate M placed over it, the lugs p passing through the slots in the opening m'. After the plate is placed below the lugs p, it is turned so that the inner edges or lips, n, catch under the lugs. The platform is then raised, either by lifting it or drawing down the weight L, thus lifting the flask or core-box from the mold or core, and the mold or core is ready for use.

The weight L counterbalances the platform, so that it moves up and down easily, and holds it at the top of the frame when not in use.

If it is desired to draw the pattern from the mold, it may be done by a fastening-arm extending across the base of the platform, and drawing it out by lifting the platform.

A core may also be placed in the mold in the same manner, and as the platform is on a true level there will be no fear of its marring the mold as it is lowered into it.

In order to draw the pattern P′ from the sand by means of the counterbalanced platform, the large end of said pattern should be provided with a central screw-threaded hole, into which I screw a T-piece, K^2, Fig. 7. The T-piece is supported upon platform K by means of a cross bar or arm, K^3.

In Fig. 8, P is a core-box, which is represented as having been lifted from the core p', it being, of course, understood that the core-box has been inverted since the core was formed by being jarred on the table B.

Among the advantages of my improved apparatus are, that, the jar imparted to the table being regular and even, the mold is more evenly packed than where the table is worked by hand. As the jars are uniform, the solidity with which the molds are packed can be gaged by the number of jars imparted by the apparatus. The cam is so formed as to lift the jarring mechanism gradually, and prevent any unnecessary clash or clatter of the machinery, and consequent wear upon it. The molds can be formed in about one-third the time, with scarcely any labor on part of the workmen. The flasks and core-boxes are lifted from the molds without marring or injuring their sides or surfaces, and the whole work can be done with mechanical accuracy.

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

1. The cam G, mounted on a suitable shaft, in combination with the jarring-table B and suitable mechanism connecting the same, substantially as and for the purposes set forth.

2. The combination of the cam G, slotted plate E, with the lug e, and lifting-rod D, substantially as and for the purposes set forth.

3. In apparatus for forming molds, the combination of the plate E, with its lug e, and the cam G and suitable connecting and disengaging mechanism, substantially as and for the purposes set forth.

4. The combination of the jarring-table B and the supporting-braces C, mounted on the guide-rods a by means of the long sockets or sleeves c, substantially as and for the purposes set forth.

5. The combination of the supporting-platform B, the pattern or flask or core-box and the lifting-platform K, having the opening *o*, through which extends the pattern or flask or core-box, and having devices for supporting either of them, substantially as set forth.

6. The combination of the lifting-plate M and the flask or core-box P, provided with the lugs *p*, under which the plate catches, 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:

JAMES I. KAY,

R. C. WRENSHALL.