F. G. SANDS.

MOLDING MACHINE.

APPLICATION FILED MAY 21, 1914.

1,127,095.

Patented Feb. 2, 1915.

2 SHEETS—SHEET 1.

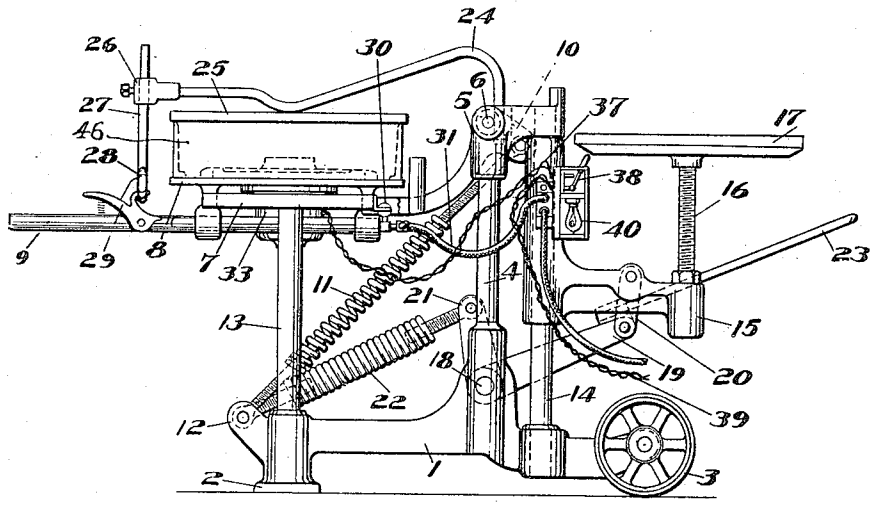


Fig. 1.

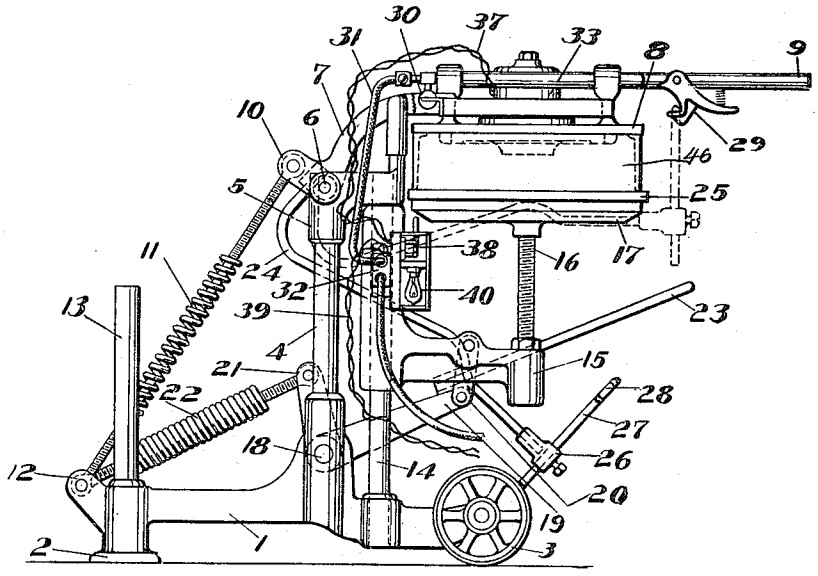


Fig. 2.

WITNESSES:

W. W. Lybrand

S. Jay Teller

INVENTOR.

Frederick G. Sands

BY

W. T. Blue

ATTORNEY.

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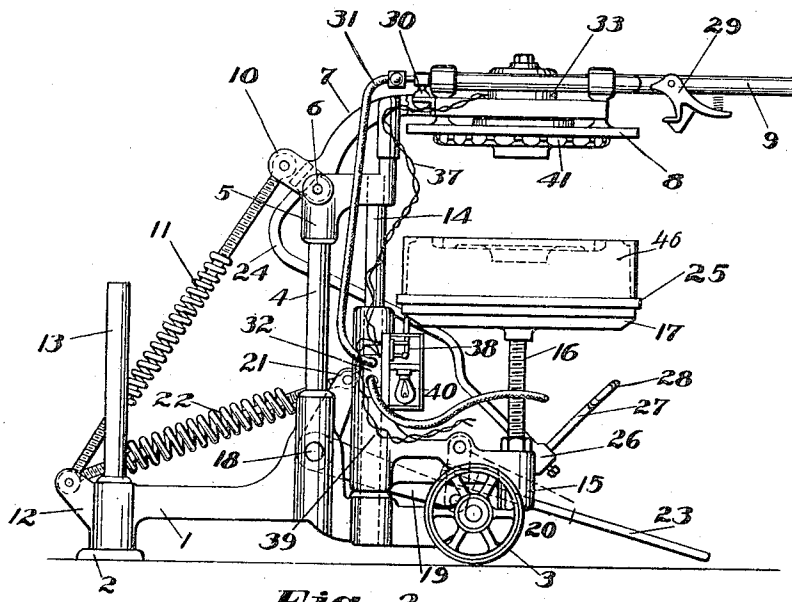


Fig. 3.

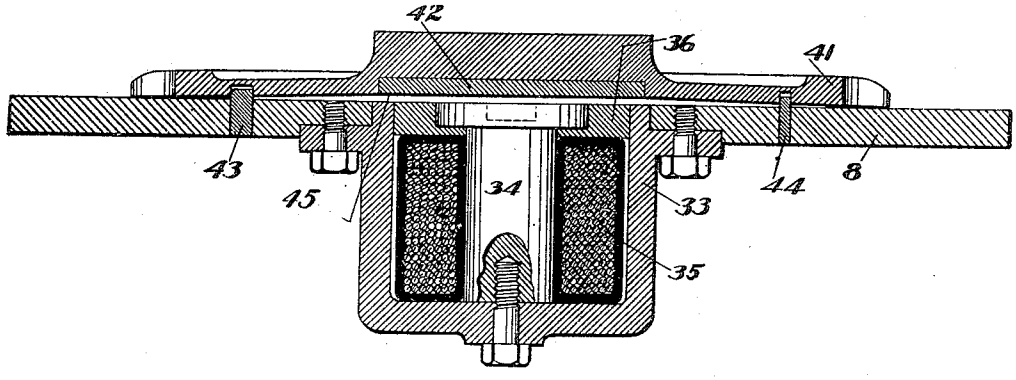


Fig. 4.

WITNESSES:

W. W. Lybrand

S. Jay Teller

INVENTOR.

Frederick G. Sands

BY

W. V. Bliss

ATTORNEY.

UNITED STATES PATENT OFFICE.

FREDERICK GARD SANDS, OF COLUMBUS, OHIO, ASSIGNOR TO THE JEFFREY MANUFACTURING COMPANY, OF COLUMBUS, OHIO, A CORPORATION OF OHIO.

MOLDING-MACHINE.

1,127,095. Specification of Letters Patent. Patented Feb. 2, 1915.

Application filed May 21, 1914. Serial No. 840,049.

To all whom it may concern:

Be it known that I, FREDERICK GARD SANDS, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful Improvements in Molding-Machines, of which the following is a specification, reference being had therein to the accompanying drawing.

The present invention relates to certain new and useful improvements in molding machines adapted to be used in the preparation of sand molds in metal foundries. As heretofore constructed, the patterns used with such machines are formed integral with the metallic follow-plates which are attached to the machine by a plurality of bolts or machine screws. The multiplication of these follow plates, and the inconvenience of frequent changes, renders such machines unsuitable for the use of foundries where single castings from a large number of patterns are required.

The object of this invention is to provide means whereby any one of a number of patterns may be readily and efficiently attached to, or removed from, a common follow plate which may be permanently secured to the machine. The device by which I attain this object will be fully set forth in the following specification and illustrated by the accompanying drawings of which—

Figure 1 is an elevation of a molding machine equipped with my improvement, showing a mold in which the sand has been fully compacted and the machine adjusted preparatory to turning over the flask. Fig. 2 is a similar view of the machine after the flask has been turned. Fig. 3 is a similar view showing the mold lowered away from the follow plate and pattern. Fig. 4 is a detail sectional view of my electro-magnetic pattern controller.

Like numerals refer to similar parts in the several figures.

In the drawings I have shown, for the purpose of illustration, a molding machine of a well known type, to which has been applied my improved electro-magnetic pattern controller. The machine illustrated comprises a main frame casting 1 having feet 2 adapted to rest upon the floor of the foundry, and wheels 3 to facilitate the movement of the machine about the floor. Projecting upward from the middle portion of the frame casting 1 are vertical columns 4 having a yoke casting 5 fixed to their upper ends. Pivotally supported on the pin 6 in the yoke casting 5 is a pair of arms 7 to which is secured the follow plate 8. A convenient handle 9 facilitates the rotation of the arms 7 together with the follow plate 8 about the pivot pin 6. The arms 7 have bell crank extensions 10 to which are connected the counterbalancing spring 11, the lower end of which is anchored to the main frame at 12. Columns 13, rising from the frame casting 1 afford support for the arms 7 and follow plate 8 during the process of ramming the sand into the mold.

Rising from the frame casting 1 are two columns 14 upon which is slidably mounted a yoke casting 15 in which are threaded two vertically adjustable screws 16. Upon each of the screws 16 is mounted a bracket 17 adapted to receive the mold during the process of withdrawing the pattern therefrom.

Extending across the main frame 1 is a pivot pin 18 upon which is mounted a lever 19, the free end of which is connected to the yoke 15 by a link 20. Formed on the lever 19 is an arm 21 to which is connected a counter-balancing spring 22, the other end of which is anchored to the main frame at 12. A foot treadle 23 affords means for depressing the yoke 15 while the spring 22 tends to hold it in the upper limit of its movement.

Pivoted on the pin 6 of the yoke casting 5 is a clamping bar 24 adapted to engage the bottom board 25 when it is placed over the flask preparatory to turning the mold over. Attached to the end of the clamping bar 24 is a socket 26 in which is adjustably secured a rod 27 having an eye 28 adapted to engage the latch mounted upon the handle lever 9, to clamp the bottom board in place.

Mounted upon the arms 7 is a pneumatic vibrator 30 supplied with compressed air from any convenient source of supply through the hose pipe 31. A suitable control valve is mounted on the frame of the machine as at 32, by which the air may be turned into the vibrator at the will of the operator.

At the center of the follow plate 8 is an aperture into which is fitted the outer pole 33 of an iron clad electro-magnet, having a central pole 34 about which is wound the

magnet coil 35. A non-magnetic cover ring 36 protects the coil from injury and the whole is finished flush with the follow plate to present a smooth surface. The lead wires 37 from the coil 35 are connected to a suitable switch 38, mounted on the frame of the machine, from which extends a conductor cable 39 to any convenient source of electrical supply. An incandescent lamp 40 mounted upon the frame of the machine serves the double purpose of a rheostat in the circuit of the magnet coil and a telltale to inform the operator of the actuation of the magnet.

The patterns 41, used with this machine, may be made of any suitable material, but are preferably formed of an alloy of aluminum, and are provided with an insert 42 of magnetic metal, adapted to coöperate with the poles of the magnet to securely hold the pattern to the follow plate. Dowel pins 43 and 44, fixed to the follow plate, engage suitable apertures in the pattern to insure its correct position. In the drawings I have shown a pattern for a sprocket wheel in which the surface 45, next to the follow plate 8, has been made slightly concave, to insure perfect contact, at the periphery, with the follow plate. The pattern being symmetrical about the center of the magnet, and comparatively thin and elastic, the attraction of the magnet is sufficient to produce perfect contact over its entire surface.

The operation of the machine is as follows: The machine being set with the arms 7 resting upon the columns 13, the follow plate upward, the pattern 41 placed so that the dowel pins 43 and 44 engage with their appropriate apertures, and the switch 38 closed to actuate the magnet. The incandescent lamp 40 notifies the operator that current has been turned on to the magnet and that the pattern is thereby clamped in place. The flask 46 is placed around the pattern in the manner common to molding machine practice. After the sand has been compacted in the flask and the top surface smoothed off, the bottom board 25 will be placed and the clamping bar 24 adjusted and clamped as shown in Fig. 1. The mold is then turned over by means of the hand lever 9. The screws are then adjusted to bring the brackets 17 into contact with the bottom board 25 to support the mold. The clamping bar 24 will then be released from the latch 29 as shown in Fig. 2. By opening the valve 32 the vibrator 30 will be actuated and the vibrations imparted to the mold will cause the sand to part from the pattern so that by applying pressure to the foot treadle 23 the flask may be lowered away from the pattern which is held to the follow plate by the magnet. As soon as the flask has been lowered the arms 7 and with them the follow plate 8 and pattern 41 will be rotated to their original position and the mold finished according to the usual foundry practice. If the pattern is to be changed before another mold is made, the switch 38 will be opened to deënergize the magnet to allow the removal of the pattern, and the operation repeated as before described.

What I claim is:

1. In a molding machine, the combination with a follow plate, of a pattern, and means within the control of the operator for holding the pattern in contact with the follow plate.

2. In a molding machine, the combination with a follow plate, a pattern, and magnetic means for holding the pattern in contact with the follow plate.

3. In a molding machine, the combination with a follow plate, of an electro-magnet, and a pattern adapted to be held in contact with the follow plate by the attraction of the magnet.

4. In a molding machine, the combination with a follow plate, of an electro-magnet having poles in the surface of the follow plate, and a pattern adapted to be held in contact with the follow plate by the attraction of the magnet.

5. In a molding machine, the combination with a follow plate, of an electro-magnet having poles in the surface of the follow plate, a pattern adapted to be held in contact with the follow plate by the attraction of the magnet and means for controlling the actuation of the magnet.

6. In a molding machine, the combination with a follow plate, of an electro-magnet having poles in the surface of the follow plate, a pattern adapted to be held in contact with the follow plate by the attraction of the magnet, means for controlling the actuation of the magnet, and visual means to indicate the actuation of the magnet.

7. In a molding machine, the combination with a follow plate, of an electro-magnet, a pattern adapted to be held in contact with the follow plate by the attraction of the magnet, and means for insuring the correct position of the pattern on the follow plate.

8. In a molding machine, the combination with a follow plate, of an electro-magnet, a pattern adapted to be held in contact with the follow plate by the attraction of the magnet, and dowel pins adapted to insure the correct position of the pattern on the follow plate.

9. In a molding machine, the combination with a follow plate, of an electro-magnet, a non-magnetic pattern, and a magnetic insert in the pattern adapted to coöperate with the magnet to hold the pattern in contact with the follow plate, as and for the purpose set forth.

10. In a molding machine, the combina-

tion with a follow plate, of an electro-magnet having poles in the surface of the follow plate, and a pattern adapted to be attracted to the follow plate by the magnet, the surface of the pattern adjacent the follow plate being concave, as and for the purpose set forth.

11. In a molding machine, the combination with a follow plate, of an electro-magnet having poles in the surface of the follow plate, and a pattern adapted to be attracted to the follow plate by the magnet, the surface of the pattern adjacent the follow plate being concave and the pattern being sufficiently elastic to allow the magnet to draw all parts of its surface into contact with the follow plate, as and for the purpose set forth.

In testimony whereof, I affix my signature, in presence of two witnesses.

FREDERICK GARD SANDS.

Witnesses:

DUDLEY T. FISHER,

P. J. HENRY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."