

J. H. LONSKEY.
MOLDING MACHINE.
APPLICATION FILED SEPT. 6, 1919.

1,337,780.

Patented Apr. 20, 1920.

4 SHEETS—SHEET 2.

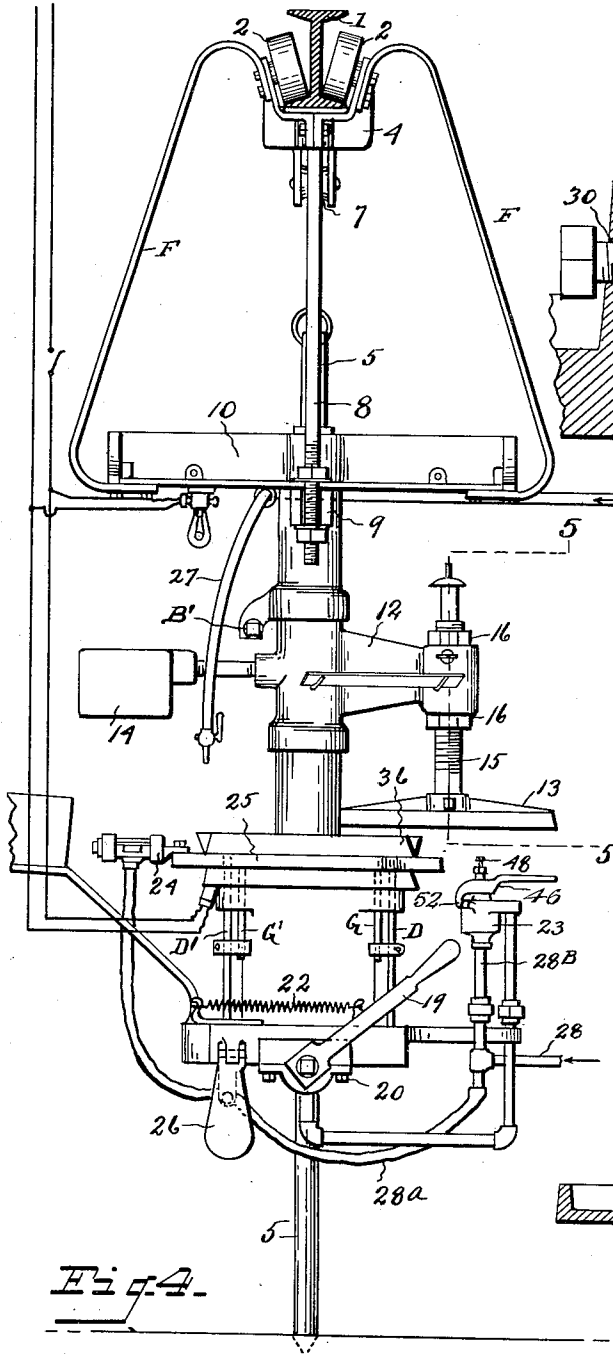


Fig. 4.

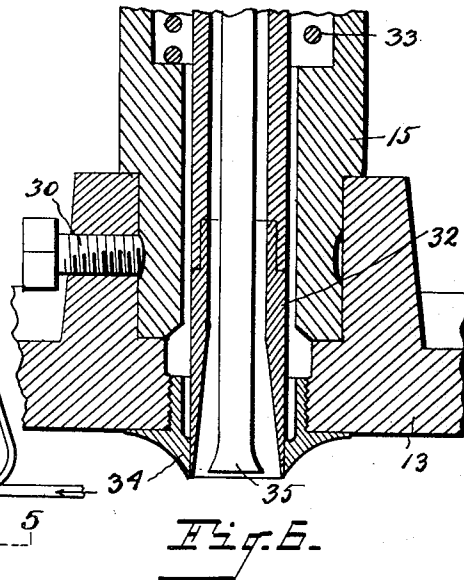


Fig. 5.

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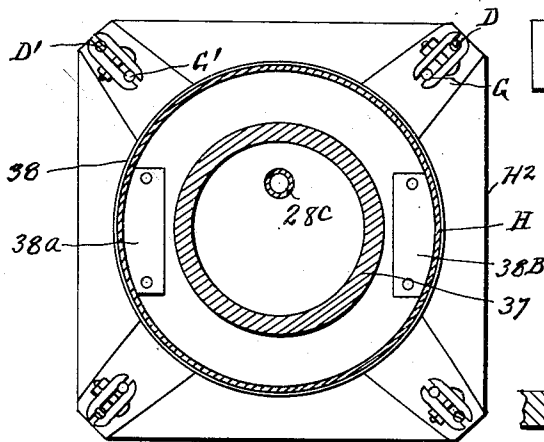
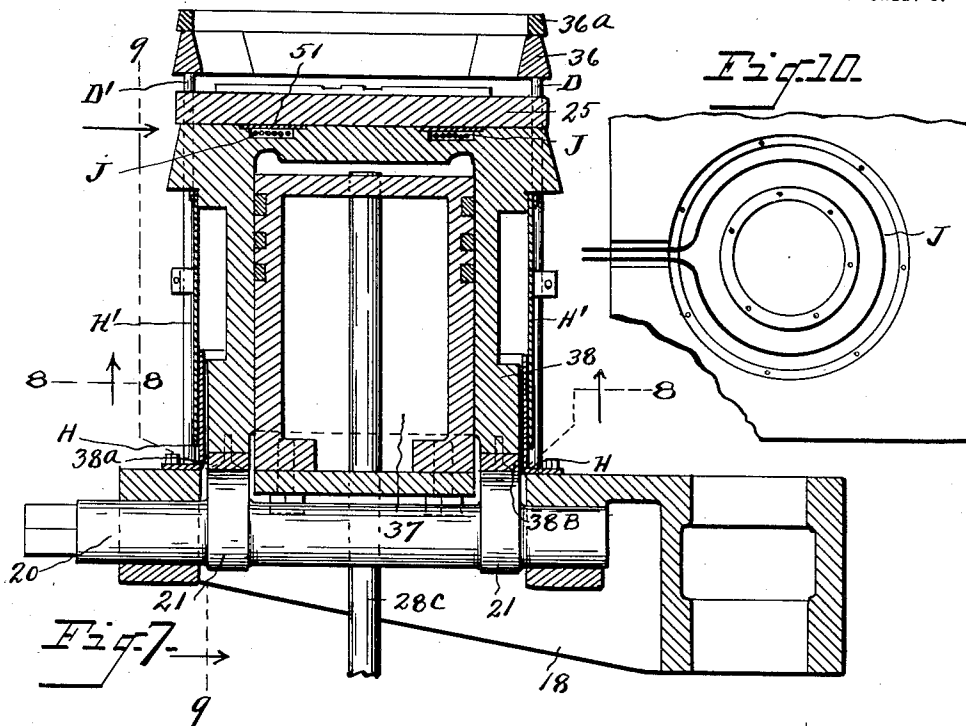


Fig. 8.

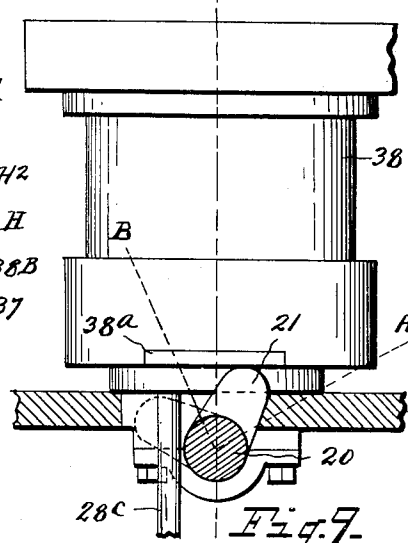


Fig. 7.

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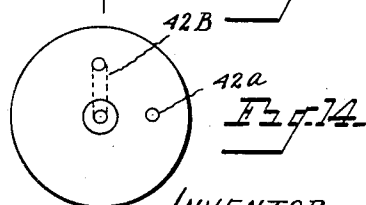
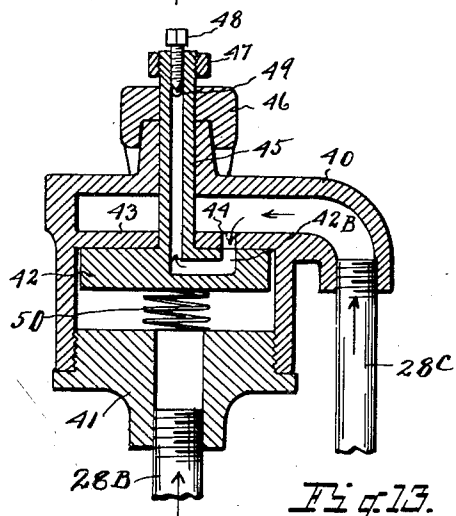
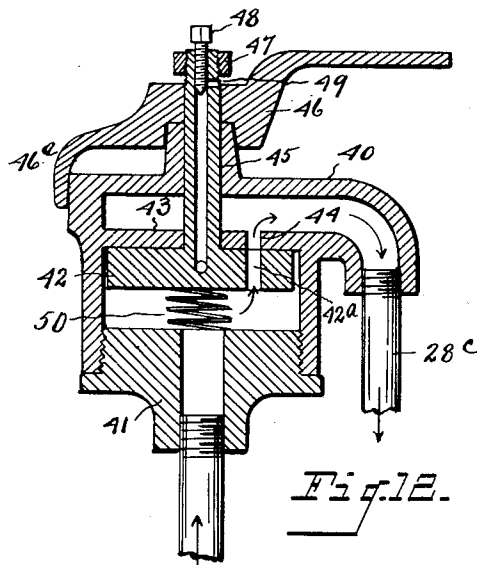
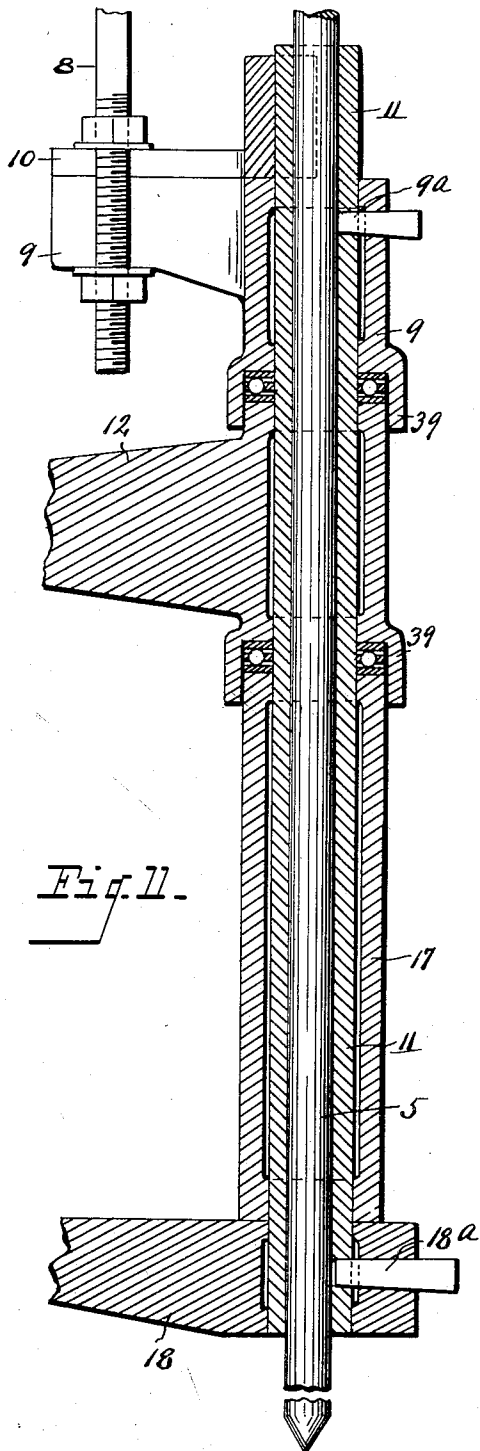
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4 SHEETS—SHEET 4.



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JOHN H. LONSKEY, OF DETROIT, MICHIGAN, ASSIGNOR TO CENTRAL SPECIALTY COMPANY, OF DETROIT, MICHIGAN, A CORPORATION OF MICHIGAN.

MOLDING-MACHINE.

1,337,780.

Specification of Letters Patent.

Patented Apr. 20, 1920.

Application filed September 6, 1919. Serial No. 322,124.

To all whom it may concern:

Be it known that I, JOHN H. LONSKEY, citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Molding-Machines, and declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to a machine for the making of molds in which castings are formed. The machine is designed to manufacture sand molds in which castings are made. The pattern here shown is for piston rings but any pattern plate may be used. The pattern plate is so designed that a mold is formed which may be superimposed above another like mold, the bottom of the one mold forming the top for the lower mold, and the several molds being stacked in a frame heretofore provided, and through the hollow centers of the several molds, the molten metal poured, reaching the molds proper by channels leading off from the central opening.

A further object of my invention is to provide a machine which in the compression of the molding sand to form the mold is so designed, that the compressing mechanism, in this instance a vertically movable cylinder carrying a pattern plate and acting against an immovable tamping plate, must move through but a minimum of space in effecting the compression desired.

A further object is to provide a machine of the character above described adapted to be swung from an overhead track and movable thereon, so that the molding sand will not have to be carried to the machine, but the machine may be moved on the overhead track along the pile of sand and the molds laid off in stacks along the track of the moving machine, also a clear floor space is provided.

A further object is to provide a machine, which utilizing compressed air in the compression of the molding sand molds, in the escape of said air after the compression is completed, automatically draws the patterns from the mold in a vertical direction therefrom, the piston acting as a guide for the withdrawal of the cylinder.

A further object is to provide a machine with electric heating device that keeps pattern at proper temperature in order to make a clear and perfect separation of sand from pattern without the aid of draft.

In the drawings:

Figure 1 is a side plan view of the machine.

Fig. 2 is a top plan view from line 2—2 of Fig. 1.

Fig. 3 is a cross sectional view on line 3—3 of Fig. 1.

Fig. 4 is a front plan view, also showing the method of suspension from the track which carries the machine.

Fig. 5 is a longitudinal sectional view of the tamping plate and its supporting mechanism taken on line 5—5 Fig. 4.

Fig. 6 is a detail sectional view of the tamping plate, plunger and hollow rod.

Fig. 7 is a vertical cross sectional view of the main cylinder piston head, and lower frame arm.

Fig. 8 is a cross sectional view taken on line 8—8 of Fig. 7.

Fig. 9 shows the cylinder with dust casings removed, the cylinder base and one of the two elevating cams used to operate the main cylinder.

Fig. 10 is a top plan view showing the electrical heating coil.

Fig. 11 is a vertical cross sectional view of the main shaft.

Fig. 12 is a cross sectional view of the three way air valve.

Fig. 13 is a cross sectional view of the three way air valve.

Fig. 14 is a top plan view of the three way air valve piston head.

Similar numerals refer to similar parts in the drawings.

Referring more particularly to the drawings:

Fig. 1 illustrates a side view of the machine, showing the same suspended from a track 1, by means of rollers or supporting wheels 2, riding over flanges 3 on each side of the track. The wheels are carried by supporting arms 4. The machine is maintained in a rigid position by means of plunger 5 which is embedded in the floor by its own weight when released from an elevated position. The plunger is elevated by means of a rope 6 operating over a pulley wheel 7, said pulley wheel being carried by

supporting arms 4. Rod 8 which is secured to supporting arms 4, passes through and supports upper shaft member 9, which is mounted on the main shaft 11, and on the upper surface of which rests and is fastened thereto a transverse shelf 10. Movable arm 12, which carries an adjustable tamping plate 13, is mounted upon the main shaft 11 and rotates on ball bearings 39, which are shown in Fig. 11. The weight of the tamping plate is supported below the movable arm by means of a hollow rod 15, the outer surface of which is threaded to receive adjusting nuts 16, by means of which the height of the tamping plate above the mold is regulated, therefore minimizing the distance through which the cylinder will have to travel in the compression of the sand in the mold flask. Lower shaft member 17, which is likewise mounted upon the main shaft, and itself supported by lower frame arm 18, which is in turn securely fastened to the main shaft 11, supports the movable arm 12. A hand lever 19, fastened to a shaft 20, upon which shaft are mounted two cams 21 for elevating the cylinder, is held in position by means of spring 22, when the cylinder is elevated. Three way air valve, illustrated in detail in Figs. 12 and 13 is shown connected up at 23.

Fig. 2 taken on line 2—2 of Fig. 1, looking downward shows the arc through which the movable arm rotates, until stopped by stop A which is carried by the movable arm 12, coming in contact with stop pins B and B', which are carried by downwardly projecting prongs from the upper casting, thus allowing movable arm 12, to rotate through an arc of approximately ninety degrees. A conventional, air operated, agitator, for agitating the pattern plate during the compression of the molding sand, is shown at 24.

Fig. 3 is a plan view of the pattern plate from above in which *i-i* are dowel pins for holding the pattern plate in position, and D and D' and D² and D³ are rods carried by the base and used to maintain the mold frame in its elevated position after the cylinder drops down. At E is shown one of the four piston ring molds in pattern plate for outlining the impression of the piston ring in the sand of the mold. It will be noted no draft is used.

Fig. 4 is a front plan view of the machine, the method of suspension and the manner in which the rollers fit over the flanges of the carrying track being clearly shown. F and F' constitute the side members of the upper portion of the frame work of the machine. G and G' are additional elevating rods, performing work similar to rods D and D' in case a different shaped pattern plate is used. 24 is just a stock form of agitator operating on the principle of an air hammer, and needs no further

description. 27 is a hose leading to a compressed air supply, fitted with stop cock and nozzle and used for clearing the top of the pattern plate of the residue of molding sand after the molding flask is removed upon the completion of the compression of the sand therein. The main air supply pipe is indicated at 28, 28^A is a branch of said main air supply pipe which leads to the agitator 24 and the passage of air thereof being regulated by means of a knee lever shown at 26, 28^B is the other branch of the main air supply pipe leading to air valve 23. Passage of air through the air valve is regulated by means of a hand lever on said valve from which air goes by way of pipe numbered 28^C and enters the main cylinder as shown in Fig. 7.

Figs. 5 and 6 are longitudinal sectional views of the supporting shaft for the tamping plate and the plate itself. 30 is a set screw for fastening the tamping plate to its supporting shaft, 31 is a stop screw which regulates the vertical motion of the plunger cutting device which operates within the tubular main shaft of the tamping plate as shown in Fig. 5. 32 is the tubular cutting device which is forced downward through the sand in the mold by means of pressure applied to its head 32^A cutting the sprue hole in the mold, said device is maintained in an elevated position by means of spring 33. 34 is a cutting nipple screwed into the tamping plate as illustrated. 35 is a plunger adapted to be forced upward upon the downward motion of the tubular cutting device by coming into contact with the molding sand within the molding flask. When pressure is released from the head 32^A, spring 33 forces the cutting device upward, the action of spring 35^A downwardly upon plunger 35 causes the plunger to maintain its relative position and ejects from the interior of said cutting device that cylindrical portion of molding sand which would otherwise be carried upward by it.

Fig. 7 is a vertical sectional view of the main cylinder 38, piston head 37, and lower frame arm 18. The cylindrical telescopic dust covering H and H' is clearly shown, the lower telescopic section H being secured to the base, and the upper portion which telescopes over the lower attached to the main cylinder 38. Elevating rods D and D' are shown, located at each corner as shown in Fig. 8, and attached to the base. The cylinder is elevated by means of the hand lever 19 turning cam shaft 20, which carries cams 21 acting against bearing plates 38^A and 38^B on the cylinder. This elevates the cylinder so that the upper surface of the pattern plate 25 is flush with the elevating rods D, and D', D² and D³ when the machine is ready to receive the molding flask and additional flask 36^A. The flask 36^A is

used to provide a sufficient quantity of molding sand for compression prior to commencement of such compression and is then removed before the compression begins.

5 Compressed air is let into the cylinder through inlet pipe 28^c by means of the manually operated air valve 23. The movable arm 12 carrying tamping plate 13 having previously been swung into position 10 above the pattern plate 25. The compressed air forces the cylinder upward, bearing plates 38^a attached to the lower end of the cylinder being carried away from cams 21, the spring 22 draws the handle 19, which 15 operates the cam shaft back to its original position. The pattern plate with the superimposed intervening molding flask being forced up firmly against the tamping plate, the molding sand is compressed in the molding flask. Coincident with letting the compressed air into the cylinder the tubular cutting device may be forced downward cutting the sprue hole in the mold. The air is then released from the cylinder by means 20 of the manually operated air valve and the cylinder drops slowly downward of its own weight and the molding flask with the molding sand therein rests on the stationary rods D, D¹, D², D³ which leaves the mold free and clear of the pattern, so the molding 25 flask can be removed and the machine is ready for another operation.

Fig. 8 is a cross sectional view taken on line 8—8 of Fig. 7. Cylindrical dust covering H which telescopes with its upper portion H' as shown in Fig. 7 is shown and in 35 addition a secondary outer dust covering H² is shown, which is fastened by being bent over the rods D and D¹. 38^a and 38^b are bearing plates fastened to the lower end of the main cylinder 38 to receive the pressure of the cams 21 carried by shaft 20.

Fig. 9 is a vertical plan view of the cylinder 38 and the cam shaft and one of the 45 cams taken on line 9—9 of Fig. 7. It shows one of the cams acting against the bearing plate 38^a. In this drawing the dust coverings have been removed from around the cylinder and are not shown.

Fig. 10 is a plan view of the electrical heating coil used to heat the pattern plate provided with sheet covering 51 preferably 50 made of copper. This is provided to heat the pattern plate to such a temperature that the pattern may be withdrawn from the mold without any draft being provided in the pattern forms.

Fig. 11 is a vertical sectional view of the main shaft 11, plunger 5, upper shaft member 9, which is fastened to the main shaft 11, as at 9^a or in any other convenient manner. Movable arm 12, ball bearings 39, on 60 which said movable arm operates, and lower casing 17 and lower frame arm 18 are shown, likewise one method of fastening

said lower arm 18 to main shaft 11 is shown as at 18^a.

Figs. 12 and 13 are cross sectional views of air valve 23. Fig. 12 shows the valve set to allow the passage of air therethrough to 70 the main cylinder; Fig. 13 to allow the escape of the same air back again and out of the valve.

The valve casting proper is indicated by numeral 40, 41 in a bottom member threaded 75 on its outer surfaces and adapted to be screwed therein, said bottom member 41 is adapted to receive an inlet pipe 28^b, through which the valve is open to the inlet of compressed air. 42 is a piston head perforated 80 as indicated in Fig. 14. 42^a being the perforation passing vertically through the piston head, and when located as in Fig. 12 allowing the passage of air directly through the piston head and inner wall 43 at the 85 opening in said inner wall indicated as 44. 42^b is a canal passing through the stem 45 to said piston head, part way through the piston head in a lateral direction and terminating vertically through the upper sur- 90 faces of said piston head, at approximately a ninety degree angle from the perforation 42^a, thus allowing a quarter turn of the piston head to bring the piston head from the position in Fig. 12 to Fig. 13. Hand 95 lever which is used to operate the device is indicated as 46. The device is closed by a nut 47 and screw 48 at the top of the stem 45. Spring 50 is used to keep the piston head 42 closed tightly against the inner wall 100 43. Stops not shown in either Fig. 12 or Fig. 13 are provided on the valve casting 40, separated by an arc of approximately 90 degrees and one of which is shown at 52 in Fig. 4, are provided, and which coming in 105 contact with the prong 46^a on the valve handle 46 serve to regulate the rotary motion of the handle, and stops the rotation of the piston head at the proper place for the passage of air therethrough. When the 110 piston head is in position as in Fig. 13, the air comes back into the valve through pipe 28^c, passing through the perforated inner wall at 44 through the air canal 42^b in the piston head 42 and its stem 45 and out at 115 an outlet port indicated at 49.

What I claim is:

1. In a molding machine adapted for suspension from an overhead track on which the same is slidably movable, a gravity plunger for securing such machine to the floor and means provided for elevating such plunger therefrom, a tamping plate adapted to resist vertical pressure, a vertically movable cylinder fitted with a pattern plate, a molding flask adapted to be superimposed over said pattern plate and means for elevating said cylinder to compress the molding sand within said molding flask against the resistance of the tamping plate, and means for 130

lowering said cylinder away from said tamping plate.

2. In a molding machine adapted for suspension from a track and on which the same is slidably movable, means for the attachment of said molding machine to the floor, the combination of a main shaft, a rotatable arm carrying an adjustable tamping plate adapted to resist vertical pressure swung from said main shaft, said tamping plate, a lower frame arm carrying a stationary piston head, a vertically movable cylinder fitted over the piston head, means for the elevating of said cylinder by the admission of compressed air between said piston head and said cylinder, a pattern plate carried by said cylinder, and a molding flask adapted to be superimposed upon said pattern plate.

3. In a molding machine, the combination of a vertically adjustable tamping plate adapted to resist upward pressure, a movable cylinder operating over a stationary piston head, a pattern plate carried by said cylinder, means for heating such pattern plate, a molding flask adapted to be superimposed over such pattern plate, independent means for supporting said molding flask, means for elevating said cylinder, pattern plate and molding flask vertically to compress the molding sand in the flask against the resistance of the tamping plate, means for lowering said cylinder and flask away from said tamping plate.

4. In a molding machine, the combination of a vertically adjustable tamping plate adapted to resist upward pressure, a movable cylinder operating over a stationary piston head, a pattern plate carried by said cylinder, a molding flask adapted to be superimposed over said pattern plate, independent supporting means for said molding flask so that said pattern plate may be raised or lowered with reference thereto, means for agitating said pattern plate, means for elevating said cylinder vertically to compress the molding sand within the molding flask against the resistance of the tamping plate.

5. In a molding machine, the combination of a main shaft, a rotatable arm carrying an adjustable tamping plate adapted to resist vertical pressure, said tamping plate, a lower frame arm carrying a stationary piston head, said piston head, a vertically movable cylinder fitted over said piston head, a pattern plate carried by said cylinder, means for heating said pattern plate electrically, a molding flask adapted to be superimposed upon said pattern plate, means for elevating said cylinder manually through a limited space, and means for elevating said cylinder by the use of compressed air inserted in the cylinder above the piston head, and means for the escape of said compressed air permitting the automatic lowering of said cylinder away from the tamping plate.

6. In a molding machine, the combination of a main shaft, a rotatable arm, a tamping plate carried by said rotatable arm, a vertically movable cylinder adapted to fit over a stationary piston head, a stationary piston head, a pattern plate adapted to be carried by said movable cylinder, means for electrically heating said pattern plate, means for agitating said pattern plate during the upward motion of the cylinder, means for manually elevating said cylinder through a limited space, and means for elevating said cylinder by the use of compressed air, a molding flask for the containing of molding sand, said molding flask adapted to be superimposed upon said pattern plate, means for the escape of said compressed air permitting the automatic withdrawal of said cylinder.

7. In a molding machine, the combination of a main shaft, a rotatable arm, upper and lower shaft members fitted about said main shaft above and below said rotatable arm, bearing plates carrying ball bearings, between said upper and lower shaft members and said rotatable arm, a tamping plate carried by said rotatable arm, a vertically movable cylinder adapted to fit over a stationary piston head, a stationary piston head, a pattern plate adapted to be carried by said movable cylinder, means for electrically heating said pattern plate, means for agitating said pattern plate during the upward motion of the cylinder, means for manually elevating said cylinder through a limited space, and means for elevating said cylinder by the insertion of compression of air between said cylinder and stationary piston head, a molding flask for the containing of molding sand, means for the escape of said compressed air permitting the automatic downward return of said cylinder.

8. In a molding machine, the combination of a tamping plate adapted to resist vertical pressure, a vertically movable cylinder fitted over a stationary piston head, a pattern plate carried by said cylinder, a molding flask adapted to be superimposed over said pattern plate, fixed vertical rods passing freely through said pattern plate to support said molding flask, means for elevating said cylinder and pattern plate flush against said molding flask and supporting the same in such position, means for automatically removing such support as the cylinder is further elevated, means for further elevating said cylinder by the admission of compressed air therein above said piston head, means for regulating admission of compressed air in said cylinder, means for lowering said cylinder by exhausting compressed air therefrom until the flask is supported by said supporting rods, and for lowering said cylinder and pattern plate away from said flask when so supported.

9. In a molding machine, a stationary piston head, a cylinder fitted thereover, a pattern plate carried by said cylinder, a molding flask adapted to be superimposed
 5 over said pattern plate, a tamping plate adapted to resist upward movement of said cylinder, pattern plate and flask compressing the mold sand, a tubular cutting device carried axially by said tamping plate, means
 10 for yieldingly supporting the same within said tamping plate, said cutting device so supported that it may be projected downward through said tamping plate cutting a
 15 sprue hole in the sand carried by said molding flask, a plunger disposed within said cutting device adapted to yield upwardly upon the admission of molding sand within
 20 said cutting tube, said plunger adapted to resume its normal position upon the release of pressure upon said tamping plate, means
 for elevating said cylinder, pattern plate and flask against said tamping plate, means
 for lowering the same away therefrom.

10. In a molding machine, a pattern plate
 25 adapted to be raised and lowered, a molding flask adapted to be superimposed over said pattern plate, a tamping plate adapted to resist upward pressure positioned above
 30 said pattern plate, a vertically disposed tubular cutting means carried by said tamping plate adapted to be projected downward
 therethrough and beyond the face thereof, supporting means for normally holding
 35 said cutting means in its upraised position within said tamping plate, such supporting means adapted to return said cutting means

to such upraised position when the pressure applied to drive the same downward through said tamping plate is removed.

11. In a molding machine, a pattern plate
 40 adapted to be raised and lowered, means for raising and lowering the same, a molding flask adapted to be superimposed over said
 plate, a tamping plate positioned above said pattern plate, a tubular punch disposed
 45 within said tamping plate adapted to be projected downwardly therethrough and beyond the face thereof, a spiral spring encircling the said tubular punch adapted to
 50 yieldingly support said punch in its upraised position within said tamping plate, a plunger disposed within said tubular
 punch normally closing the passageway therethrough but adapted to yield upwardly
 55 during the compression of the sand within the molding flask and adapted to return to its normal position when such pressure is removed.

12. In a molding machine, a pattern plate
 adapted to be raised and lowered, a mold-
 60 ing flask adapted to be superimposed over said pattern plate, a tamping plate adapted to resist upward, vertical pressure positional above said pattern plate, means for raising
 and lowering said pattern plate, an over-
 65 head track, means for supporting said machine from said track in such a manner that the machine may be moved longitudi-
 nally along said track.

In testimony whereof I sign this specification.
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