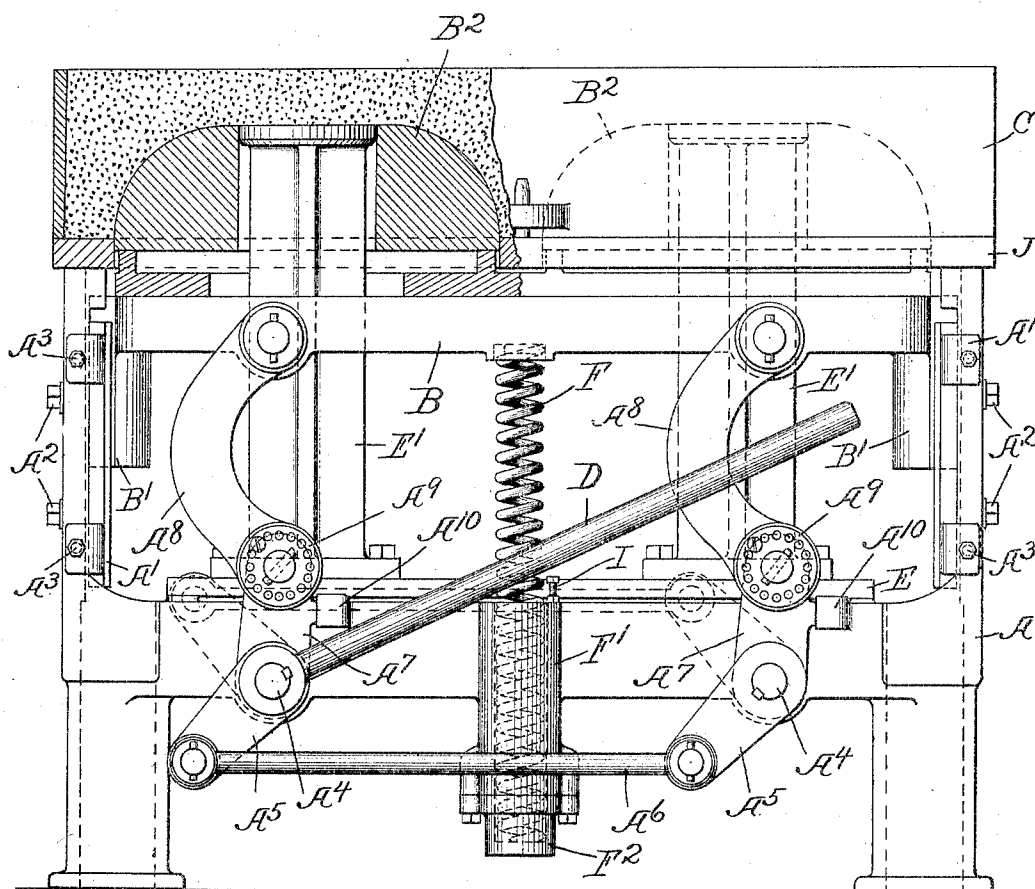
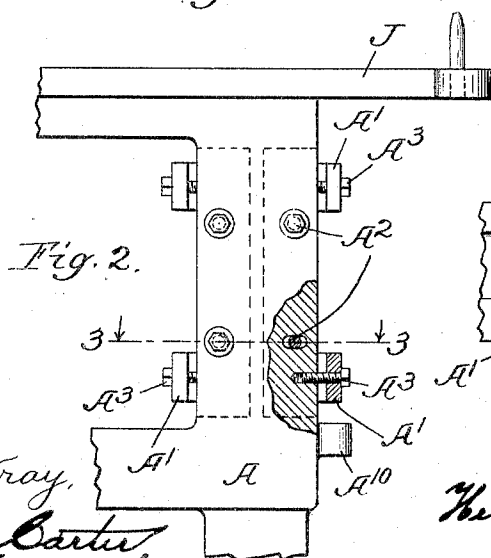
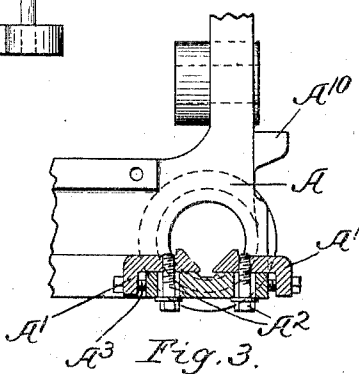


H. E. PRIDMORE.
MOLDING MACHINE.
APPLICATION FILED MAY 4, 1899.

3 SHEETS—SHEET 1.



Witnesses.

Edward T. Wray.

Donald M. Carter

Inventor.

Henry C. Richmore

No. 784,123.

PATENTED MAR. 7, 1905.

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3 SHEETS—SHEET 2.

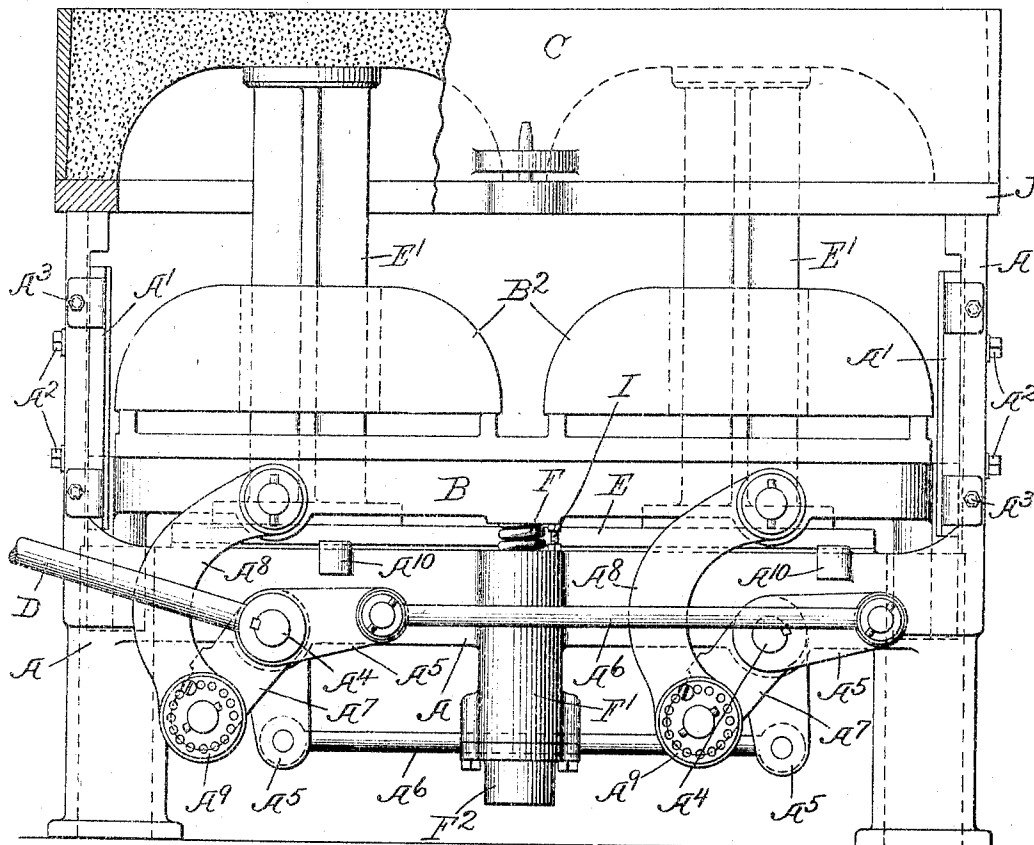


Fig. 4.

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3 SHEETS—SHEET 3.

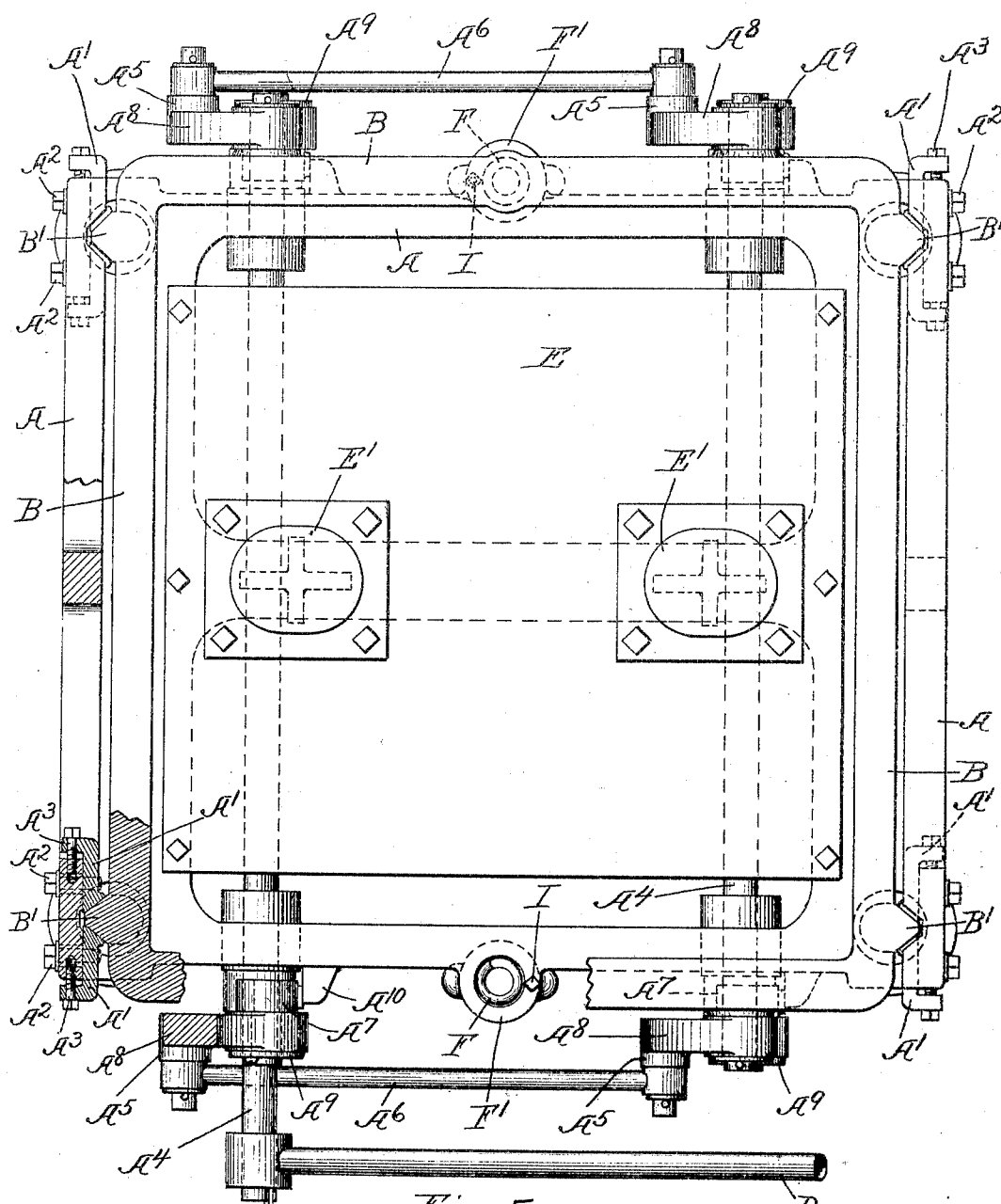


Fig. 5.

Witnesses.

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UNITED STATES PATENT OFFICE.

HENRY E. PRIDMORE, OF CHICAGO, ILLINOIS.

MOLDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 784,123, dated March 7, 1905.

Application filed May 4, 1899. Serial No. 715,533.

To all whom it may concern:

Be it known that I, HENRY E. PRIDMORE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Molding-Machines, of which the following is a specification.

My invention relates to molding-machines, and has for its object to provide a new and improved molding-machine, of which the following is a description, reference being had to the accompanying drawings, wherein—

Figure 1 is an end view with parts broken away, showing a molding-machine embodying my invention. Fig. 2 is a detail showing the construction of the guideways for the pattern-carrier. Fig. 3 is a section on line 3 3, Fig. 2. Fig. 4 is a view similar to that illustrated in Fig. 1, showing the pattern withdrawn from the flask. Fig. 5 is a plan view of Fig. 1, showing the flask and pattern removed.

Like letters refer to like parts throughout the several figures.

A commercially-successful molding-machine should be so constructed that the pattern-carrier upon which the pattern is supported will be perfectly rigid, so that when the sand is compressed in the flask such pattern-carrier and pattern will not give or spring or become displaced in any degree. This pattern-carrier should also be supported so that when the pattern is withdrawn from the flask the movement of the pattern-carrier and of the pattern will be a movement of translation—that is, a movement wherein all of the particles are simultaneously moved in parallel directions. The machine should also be of such form that when a large machine is used, necessitating a long draw or movement of the pattern, the machine will not be so high as to make it difficult or inconvenient for the operator in filling the flask and compressing the sand therein.

The object of my present invention is to provide a molding-machine which will obviate these and other difficulties and which will greatly simplify and facilitate the formation of molds of all descriptions.

I have selected a simple construction em-

bodying my invention for the purpose of making such invention easily understood. It is of course evident that the form, construction, and arrangement of the parts may be varied in many particulars; but I do not consider it necessary to show such variations, as they will readily occur to those versed in the art. Neither do I limit myself by the construction I have selected for the purpose of describing my invention.

Referring now to the accompanying drawings, I have shown a machine comprising a suitable frame A, carrying the movable pattern-carrier B, upon which the pattern is supported. Said pattern-carrier is provided with a series of guides B', confined in suitable guideways associated with the frame A, so that the pattern-carrier may be moved to withdraw the pattern from the flask C. Instead of cutting out the frame A to form the guideways, and thereby weakening said frame, I place the way-pieces A' A' inside the frame, as illustrated in Figs. 2 and 3, said way-pieces forming a guideway for the guides associated with the pattern-carrier. These way-pieces may be of any construction and attached to the frame in any desired manner. As herein illustrated, said way-pieces are connected to the frame by means of bolts A², which fit into enlarged holes, so as to allow for adjustment. The way-pieces are also provided with adjusting-screws A³, so that the desired adjustment may be easily obtained. A suitable flask C is mounted upon the frame A, and the pattern from which the impression for the mold is to be taken is mounted upon the pattern-carrier B. It is of course evident that any desired pattern may be used; but for the purpose of avoiding complications I have shown a simple pattern B², which consists of the two halves of an elliptical-shaped pipe. The pattern-carrier B is movably mounted on the frame A in some suitable manner, so that it may be moved in order to withdraw the pattern from the flask. Any suitable construction for this purpose may be used. As shown in Fig. 1, the frame is provided with two rotatable shafts A⁴, said shafts being connected so as to rotate in unison, there being provided a connection between each shaft and the

pattern-carrier by means of which the pattern-carrier may be reciprocated when the shafts are rotated, thus withdrawing the pattern from the flask. The shafts are preferably connected
5 with the pattern-carrier at two points at a distance from each other.

Referring to Fig. 1, which shows an end view of the machine, the shafts A^1 are provided with the cranks A^2 , connected together
10 by the rod A^6 , and are also provided with cranks A^7 , to which are attached the connecting-pieces A^8 , by means of which the shafts are connected with the pattern-carrier. These cranks and connecting-pieces may be of any
15 suitable form. As herein shown, the connecting-pieces A^8 are formed or bent so that the ends may be passed by the shafts when the parts are moved to withdraw the pattern from the flask, as shown in Fig. 4. This construction permits the use of a short crank without
20 shortening the draw of the pattern, and thus allows the height of the machine to be reduced. The machine herein shown has a duplicate set of cranks and connecting-pieces at its other
25 end. The cranks at one end are set at an angle to the cranks at the other end, so that when one set of cranks is at a dead-center the other set will be in an operative position. These two sets of cranks are shown in Fig. 4. A lever D is
30 connected with one of the shafts A^1 , the shafts being rotated by moving this lever. When the pattern used is of such shape or size as to necessitate a support or stool for the sand while said pattern is being withdrawn, I provide
35 a suitable stool-plate or the like E , (see Fig. 5,) upon which such stools E' may be supported. The plate E is attached to the frame A , so that the stools remain stationary while the pattern is being withdrawn. I prefer
40 to use suitable springs F , interposed between the pattern-carrier and the frame to aid in moving the pattern-carrier upward. I also prefer to construct the parts so that when the pattern-carrier is in the position shown in Fig.
45 the center of the crank-pins of the cranks A^7 will be moved slightly past the planes connecting the centers of the shafts A^1 and the pins on the pattern-carrier to which the connecting-pieces A^8 are connected. The parts
50 are held in this position by means of the lugs A^{10} on the frame A , which engage the cranks A^7 , as shown in Fig. 1. This arrangement insures the rigidity of the parts when the sand is being compressed in the flask.

It will be noted that there is a connection
55 from the shafts to the pattern-carrier at several points. This construction permits the pattern-carrier to be moved properly and obviates all tendency of the pattern-carrier to twist or move unevenly or bind between the
60 guides. There must be connections to this pattern-carrier at least at three points to produce this result. It will also be noted that the ends of the frame are open, the pattern-
65 carrier being mounted between the side pieces.

This permits the pattern to project beyond the ends of the pattern-carrier without obstructing the movement thereof. It will also be noted that the shaft or shafts are entirely
70 below the pattern-carrier upon which the pattern is supported.

I have shown the molding-machine illustrated in the drawings as provided with two springs F , located at different points. These
75 springs besides aiding in raising the pattern-carrier aid in preventing the binding of the pattern-carrier at the guides. If, for example, the pattern is irregular, the weight is unevenly distributed, and it often happens that one end
80 of the pattern is extremely heavy, while the other end is very light. To provide for this, I have the springs removably attached in position so that a strong or heavy spring can be placed under the heavy end of the pattern
85 and a light or weaker spring placed under the lighter end of the pattern, thus compensating for the irregularity in weight, so as to prevent the binding of the parts. To facilitate the removal of the springs for this and
90 other purposes, I provide the frame with receiving parts F' for the lower end of the springs, said receiving parts provided with the removable caps F'' . In inserting the spring the cap is removed and the spring passed from the bottom through the receiving part F' until
95 its upper end engages the pattern-carrier. The cap F'' is then placed in position so as to hold the parts in their proper relation. I prefer to provide the frame with two stops I , located so as to engage the pattern-carrier at different points
100 and limit its downward movement. These stops are adjustably attached to the frame and, as shown, consist of long screws associated with the receiving parts F' . In some instances the "draw" of the pattern is small—
105 that is, the pattern-carrier need only be moved a short distance to remove the pattern from the flask. In such cases the adjustable stops are moved to a position where they will engage the pattern-carrier and prevent its further
110 downward movement after the withdrawal of the pattern, both stops striking the pattern-carrier at the same time. The location of the cross-connecting mechanism between the two shafts A^1 outside of the frame
115 of the machine enables me to very materially reduce the height of the machine and at the same time obtain the other beneficial results of my construction.

A molding-machine is ordinarily used under
120 conditions very disadvantageous to all bearings and guides, for the reason that sand, dust, and dirt are continually brought into contact with the parts which are exposed when the machine is being used. When the guideways
125 are formed as herein shown, they are completely protected by the stripping-plate J , which is laid upon the upper edge of the frame and which supports the flask. The pattern is withdrawn from the flask through
130

openings in the stripping-plate, said stripping-plate holding the material in the flask in position.

It will be seen that when the molding-machine is in use the guideways are protected from the sand and dirt always present in a foundry.

The use and operation of my invention are as follows: When the desired pattern is placed upon the pattern-carrier and the flask is in position, the pattern is moved upwardly into the flask by means of the lever D, as illustrated, for example, in Fig. 1. This lever consists simply of a handle connected with the shaft, so that when moved the shaft will be rotated. The flask is then filled and the sand compressed so as to retain the imprint of the pattern. The pattern is then withdrawn from the flask by moving the lever D, the parts taking the position shown, for example, in Fig. 4. The flask may then be removed and is ready for use. In the pattern I have here selected it is only necessary to have one machine, as the two halves of the pattern are the same, and the mold is formed by placing two of the flasks together. In most instances, however, the two halves of the pattern are different, and hence it is necessary to have two machines or at least two sets of patterns to produce the complete mold.

It will thus be seen that by this construction a mold of any desired form and size may be easily formed and that the machine may be operated in any convenient place. It will also be seen that a very low machine is produced and that the height of the machine is independent of the size of the device to be molded, except so far as such size necessitates an increased movement of the pattern in order to withdraw it from the mold. It will further be seen that the pattern-carrier is stably and securely supported and is free from spring or elasticity, thus insuring the successful operation of withdrawal of the pattern, even though the pattern is of comparatively great dimensions.

I claim—

1. A molding-machine comprising a frame, two parallel shafts rotatably mounted thereon, two cross connecting-pieces beyond the ends of said shafts so as to be free to pass the ends, and adapted to connect the shafts so that they rotate in unison, a reciprocating pattern-carrier, movably mounted on said frame and adapted to support the pattern, and a connection between said shafts and said pattern-carrier.

2. A molding-machine comprising a frame, two parallel shafts rotatably mounted thereon, each provided with two cranks at an angle to each other, two connecting-pieces connecting the respective cranks of the two shafts, a reciprocating pattern-carrier movably mounted on said frame and a connection from said pattern-carrier to both of said shafts.

3. A molding-machine comprising a frame, two shafts rotatably mounted thereon, a yoke movably mounted on said frame and adapted to support the pattern from which the impression is to be taken, two cranks connected with each of said shafts at different points along their length, the cranks on each shaft being at an angle to each other, two connections between the cranks on the two shafts, so that when one shaft is rotated the other will also be rotated, and a connection between said shafts and the pattern-carrier so that the yoke will be moved when the shafts are rotated, the connections between the shafts and the pattern-carrier being at fixed points on said pattern-carrier which do not change as the pattern-carrier moves.

4. A molding-machine comprising a frame, two shafts rotatably mounted thereon, a pattern-carrier movably mounted on said frame and adapted to support the pattern from which the impression is to be taken, two cranks connected with each of said shafts, the cranks on each shaft being at an angle to each other, two connections between the cranks on the two shafts so that when one shaft is rotated the other will also be rotated, a series of connecting-pieces connected at one end with said shafts and at the other end to fixed points on said pattern-carrier, said connecting-pieces being formed or bent so as to permit their ends to pass below the shafts.

5. A molding-machine comprising a frame, a reciprocating pattern-carrier supported upon said frame, adapted to carry the pattern, two shafts mounted on said frame, two cross connecting-pieces beyond the ends of said shafts so as to be free to pass the ends and adapted to connect the shafts so that they rotate in unison, said shafts entirely below the reciprocating pattern-carrier, projecting parts extending beyond the outer boundary of said pattern-carrier and connected at one end to fixed points on the pattern-carrier and at the other end with said shafts so that the pattern-carrier moves proportionately and simultaneously with said shafts, whereby it may be reciprocated to vary the position of the pattern.

6. A molding-machine comprising a frame, one or more shafts mounted on said frame, a reciprocating pattern-carrier upon which the pattern is supported, said shaft or shafts connected with said pattern-carrier so that the position of the pattern-carrier is varied when the shaft or shafts are rotated, and two springs mounted upon said frame at different points and interposed between the pattern-carrier and the frame.

7. A molding-machine comprising a frame, one or more shafts mounted on said frame, a reciprocating pattern-carrier upon which the pattern is supported, said shaft or shafts connected with said pattern-carrier so that the position of the pattern-carrier is varied when the shaft or shafts are rotated, and two springs

located at different points and interposed between the pattern-carrier and the frame, said springs of different strength to compensate for irregularities in the pattern.

5 8. A molding-machine comprising a frame, one or more shafts mounted on said frame, a reciprocating pattern-carrier upon which the
10 position of the pattern-carrier is varied when the shaft or shafts are rotated, two springs located at different points and interposed between the pattern-carrier and the frame, and
15 two receiving parts into which the ends of the springs are received, said receiving parts provided with removable caps whereby the springs are removably held in position.

9. A molding-machine comprising a frame having two side pieces but open at the ends,
20 guideways on the said side pieces, a pattern-carrier provided with a series of separated guides having a sliding connection with said guideways so that said pattern-carrier is guided by said side pieces, means for moving

said pattern-carrier below the upper edge of 25 said side pieces, said open ends arranged so that the pattern may move to its highest or its lowest position without coming opposite any end cross-piece whereby projecting parts of the pattern at the ends will not strike the 30 frame.

10. A molding-machine comprising a frame, having side pieces, but open at the ends, a pattern-carrier supported by the frame and guided by said side pieces, two parallel shafts 35 mounted on said frame and connected together so as to rotate in unison, connecting-pieces connected to the ends of the pattern-carrier at the open ends of the frame and also connected with said shafts, the open ends of the frame 40 permitting the movement of these connecting-pieces without obstruction so that the pattern-carrier may move below the upper edges of the side pieces of the frame.

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Witnesses:

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HOMER L. KRAFT.