No. 731,629. PATENTED JUNE 23, 1903.

F. J. STRATTON.

OPERATING LEVER FOR MOLDING MACHINES.

APPLICATION FILED NOV. 7, 1900. RENEWED FEB. 24, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.

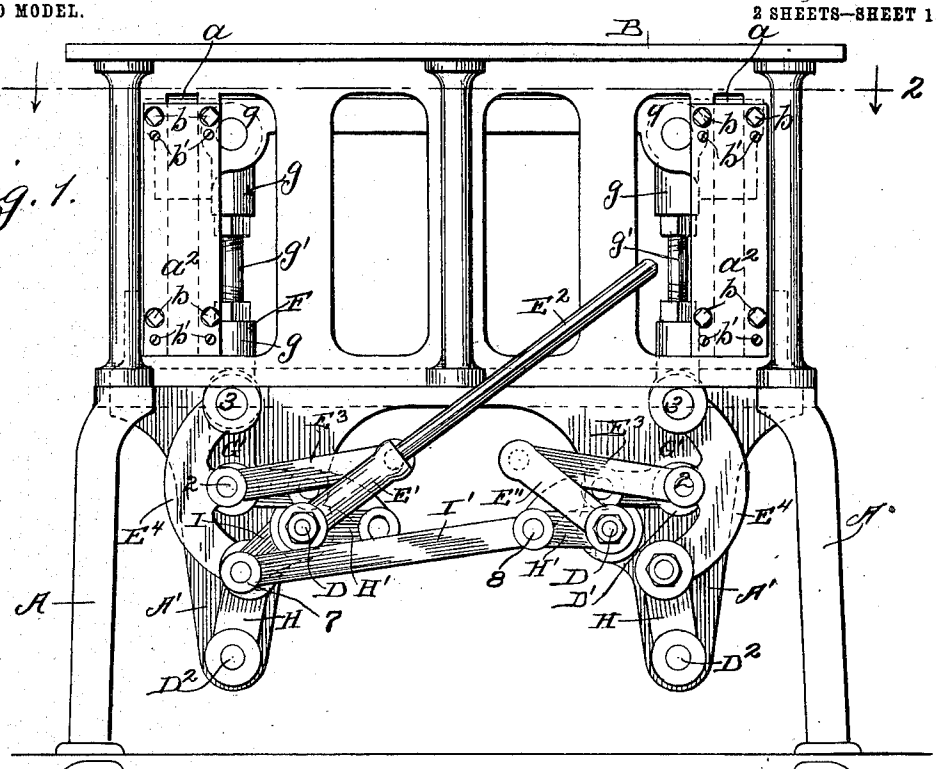
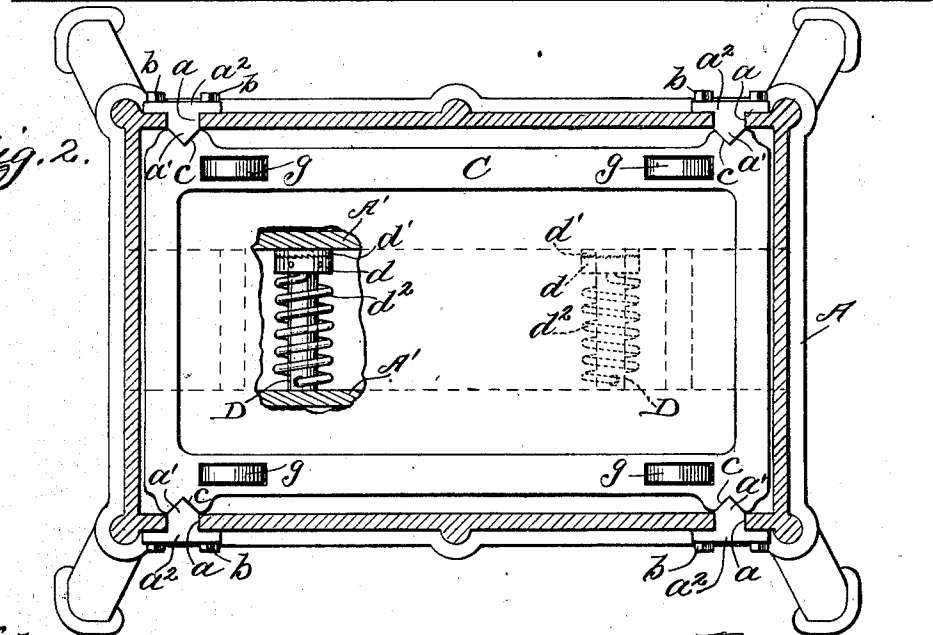


Fig. 2.



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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 3.

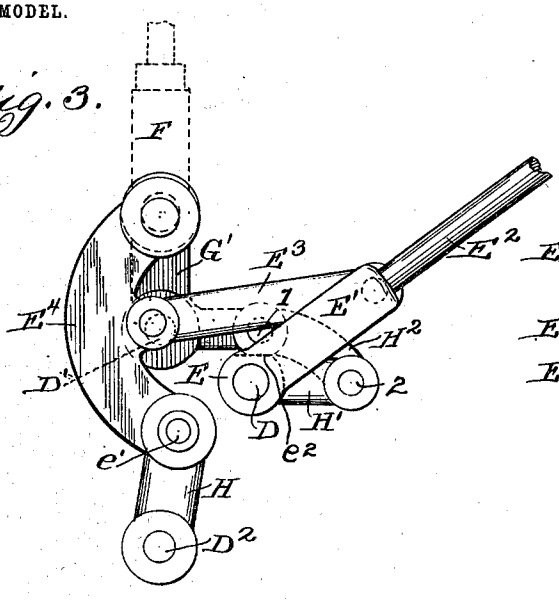


Fig. 4.

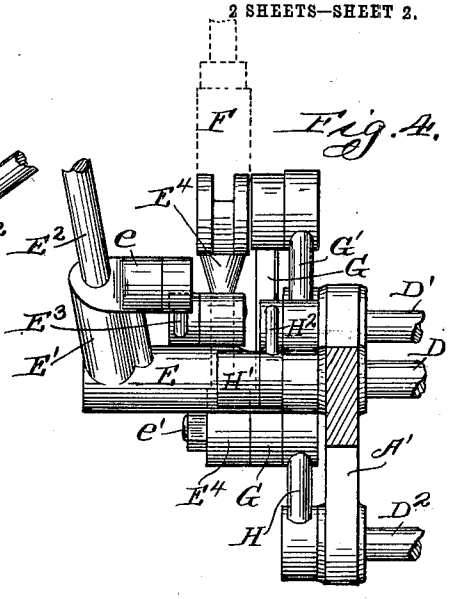


Fig. 5.

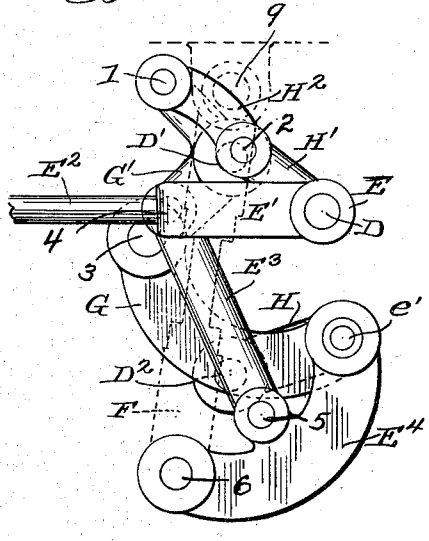
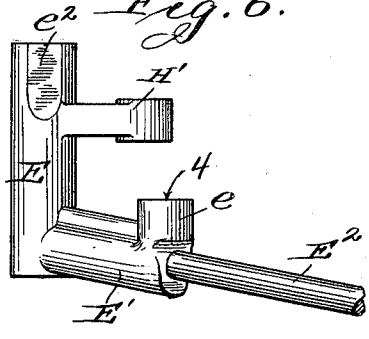


Fig. 6.



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No. 731,629. Patented June 23, 1903.

UNITED STATES PATENT OFFICE.

FRANK J. STRATTON, OF LAGRANGE, ILLINOIS, ASSIGNOR TO OREGON FOUNDRY AND MACHINE COMPANY, OF OREGON, ILLINOIS, A CORPORATION OF ILLINOIS.

OPERATING-LEVER FOR MOLDING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 731,629, dated June 23, 1903.

Application filed November 7, 1900. Renewed February 24, 1903. Serial No. 144,824. (No model.)

To all whom it may concern:

Be it known that I, FRANK J. STRATTON, a citizen of the United States, residing at Lagrange, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Operating-Levers for Molding-Machines, of which the following is a specification.

This invention relates to improvements in molding-machines; and it consists in certain peculiarities of the construction, novel arrangement, and operation of the various parts thereof, as will be hereinafter more fully set forth and specifically claimed.

The objects of my invention are, first, to provide a mechanism or mechanical movement for easily lowering and raising the pattern-frame in a vertical plane; second, to furnish such a mechanism the parts of which shall be so constructed and arranged with respect to one another that they will not become locked or set, or, in other words, will always provide leverage, and, third, to give to the pattern-frame an extensive vertical movement with a slight movement of the operating-lever.

Other objects and advantages will be disclosed in the subjoined description and explanation.

In order to enable others skilled in the art to which my invention pertains to make and use the same, I will now proceed to describe it, referring to the accompanying drawings, in which—

Figure 1 is a view in side elevation of a molding-machine embodying my invention. Fig. 2 is a plan view, partly in section and partly in elevation, taken on line 2 2 of Fig. 1. Fig. 3 is a view in side elevation of the raising and lowering mechanism detached from the frame, showing the parts thereof in the positions they will assume when the pattern-frame is in its raised position. Fig. 4 is an end view in elevation thereof. Fig. 5 is a view in side elevation of the raising and lowering mechanism detached from the frame, showing the parts thereof in the position they will assume when the pattern-frame is in its lowered position; and Fig. 6 is a detached plan view of the handpiece or operating-lever.

Similar characters refer to like parts throughout the different views of the drawings.

A represents the main or supporting frame, which may be made of any suitable size, form, and material, but preferably rectangular in shape, as is shown in Figs. 1 and 2 of the drawings. On the top of the frame A is mounted a stripper-plate B of the ordinary or any preferred form and construction, on which the flasks or mold-boxes (not shown) rest. The sides of the frame near each of its ends are provided with vertical slots *a*, through each of which extends a rib or guide *a'*, having its inner surface angular or V-shaped in cross-section, as is clearly shown in Fig. 2 of the drawings. These ribs or guides are preferably formed integral with plates a^2, but may be otherwise secured thereto, and which plates are adjustably secured to the sides of the frame A by means of screws *b* and *b'*, which may be tightened or loosened when it is necessary to project or retract the ribs or guides, so as to cause them to properly engage and hold the pattern-carrying frame C, herein claimed as the "movable member," and which is rectangular in shape and has near each of its corners an angular or V-shaped groove *c* for the reception and operation of the ribs or guides.

Extending longitudinally with the frame A and connected thereto between its sides are hangers A', which project downwardly and serve as supports for the shafts D, D', and D^2, each of which is journaled in said pieces or extensions, so as to rock or oscillate therein. In the drawings I have shown a molding-machine embodying my invention, which is illustrated as requiring four sets of the mechanism or mechanical movement employed for lifting and lowering the pattern-carrying frame; but inasmuch as said sets or movements are counterparts of one another, except that they are made rights and lefts, it will be necessary to describe the construction and operation of one of said sets only; but reference will be made to its connections with the other movements.

Extending transversely of the machine at each end thereof and journaled in opposing hangers A' are the three shafts D, D', and D^2,

and when there are four of the mechanisms above mentioned two mechanisms are mounted on each group of three shafts—one near each hanger. Each mechanism comprises a hand-lever of the second class fulcrumed on the shaft D, a bell-crank lever of the first class fulcrumed on the shaft D′, and a segment-lever of the third class fulcrumed to the shaft D^2, together with parts connecting these various levers with each other and connecting the power end of the segment-lever with the pattern-frame. The hand-lever is best seen in Fig. 6. It comprises a barrel E, which is keyed to the shaft D and is flattened at e^2 for a purpose to appear below, a projection E′ extending radially from this barrel and carrying a boss *e*, to which is pivoted the load or weight, as hereinafter described, and an arm H′, spaced from the projection longitudinally of the barrel and also projecting radially from the latter for a purpose to appear below. All of the four or both of the two hand-levers in the machine are alike, save that one of them has its projection E′ continued, as at E^2, in a handle which receives the power for operating the entire machine. The bell-crank lever G′ is a lever of the first class and is pivoted intermediate its ends on the second shaft D′. To the outer extremity of its short arm is pivoted at 1 a link H^2, whose other end is pivoted at 2 to the outer end of the arm H′ on the hand-lever, through which connection motion is imparted from the hand-lever to the bell-crank lever. To the outer end of the long arm of the bell-crank lever at 3 is pivoted one extremity of a segment-link G, whose other extremity is pivoted on a shaft *e′*, and this shaft is allowed a swinging movement around the shaft D^2 by means of a link H, pivotally connecting these two shafts. The segment-lever E^4 is fulcrumed at one extremity on the swinging shaft *e′*. It receives its power intermediate its length through the instrumentality of a push-bar E^3, which is pivoted at one end at 4 to the boss *e* on hand-lever, and is pivotally connected at the other end at 5 to the center of the segment-lever, and the weight or load is attached to the other extremity of the segment-lever through the instrumentality of a connecting-rod F, which is pivoted at one end at 6 to the segment-lever and at the other end at 7 to the pattern-frame, this connecting-rod being extensible in its length, preferably by being made in two parts *g g*, connected by a right-and-left screw *g′*, which can be turned in either direction desired.

Secured at one of its ends to each of the shafts D is a spring d^2, whose other end is connected to a ratchet-wheel or toothed disk *d*, loosely mounted on said shaft, and which disk engages another toothed disk *d′*, fixed to one of the hangers A′. These springs are employed for assisting in the upward movement of the pattern-frame, and their tension may be regulated by turning the disk *d* in the proper direction by means of a spanner or other suitable instrument. As above stated, the mechanisms on either group of shafts will operate simultaneously, because the two hand-levers are keyed onto the single shaft D.

The mechanisms at opposite ends of the machine are connected with each other in any suitable manner, so that they shall move simultaneously though, preferably, in opposite directions; but in the present case I have shown in Fig. 1 a connecting-bar I′, pivoted at 9 at one extremity to an arm I, projecting rigidly outward and downward from one of the hand-levers, preferably that one having the handle E^2, and pivoted at its other extremity at 8 to the arm H′ of the other hand-lever, and from this it will be seen that when the left-hand shaft D is turned to the left in the illustration the right-hand shaft D will be caused to simultaneously turn to the right.

From the foregoing and by reference to the drawings it will be seen and clearly understood that by moving the lever from the position shown in Figs. 1, 3, and 4 of the drawings to that shown in Fig. 5 the pattern-frame will be lowered a considerable distance from the stripper-plate and that when in its lowered position the fulcrum-points of the different parts will be so arranged with respect to one another that the parts cannot become locked or set and that the pattern-frame may be readily raised to its normal position. In the position of parts best seen in Fig. 3 the short arm of the bell-crank lever G′ rests on the flattened portion e^2 of the hand-lever and the pattern-frame is in elevated position. When now the handle E^2 is moved to the left to the position shown in Fig. 5, the parts of the mechanism have the following operation: The arm H′ is moved upward and outward over the fulcrum D and the link H^2 travels bodily around such fulcrum, which causes the short arm of the bell-crank lever G′ to move upward and outward in parallelism with the arm H′. This throws the long arm of the bell-crank lever outward and downward, and the segment-link G (which in Fig. 3 is hidden behind the segment-lever E^4) is forced downward at its upper end 3, while its lower end, which is pivoted on the swinging shaft *e′*, is caused to travel inward and downward partially around the shaft D^2, because it is connected therewith by the link H, and the fulcrum *e′* of the segment-lever thus becomes a moving one. Simultaneously the boss *e*, which is at the outer end of the projection E′ of the hand-lever, is carried upward and outward over the fulcrum D, and the push-bar E^3, which is pivoted at 4 to said boss, is moved thereby. The other end 5 of this push-bar being connected with the segment-lever necessarily travels therewith, and thus applies the power for operating this lever. It will thus be seen that the last-mentioned lever is swung bodily from the upright position (shown in Fig. 3) outward, (here to the left,) then downward, and finally inward to

the position shown in Fig. 5, and its working end 6, which is pivoted to the connecting-rod F, naturally carries that rod with it. Hence the pattern-frame which is pivoted at 9 to the other end of this rod is caused to quickly descend to the position indicated in dotted lines in Fig. 5. A movement of the hand-lever E^2 in the opposite direction causes the reverse movement of parts, and the mechanism or mechanisms at the other end of the machine are caused to move simultaneously through the instrumentality of a connecting-bar I' in a manner which will be clear.

While I have shown in Fig. 2 of the drawings and have above stated that the machine is illustrated as being equipped with four sets of the raising and lowering mechanisms—that is, one set located at each corner of the main frame and on each of the ends of the transversely-journaled shafts—yet I may employ two sets only without departing from the spirit of my invention.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a machine of the character described, the combination with the main framework, a group of shafts therein, a movable member, and an adjustable connecting-rod pivoted to the latter; of a hand-lever mounted on one shaft, a segment-lever pivoted at one end to said connecting-rod and pivotally connected at its other end with another of said shafts, and a push-bar connecting the hand-lever with the segment-lever at a point intermediate the length of the latter, substantially as described.

2. In a machine of the character described, the combination with the main framework, a group of shafts therein, the movable member, and a connecting-rod pivoted to the latter; of a hand-lever mounted on one shaft, a segment-lever pivoted at one end to said connecting-rod, a link pivotally connecting its other end with another of said shafts, means for swinging this end of the segment-lever around its supporting-shaft, and a push-bar connecting the hand-lever with the segment-lever at a point intermediate the length of the latter, substantially as described.

3. In a machine of the character described, the combination with the main framework, a group of shafts therein, the movable member, and a connecting-rod pivoted to the latter; of a hand-lever mounted on one shaft, a segment-lever pivoted at one end to said connecting-rod, a link pivotally connecting its other end with another of said shafts, a segment-link pivoted at one end to the swinging end of the segment-lever, a bell-crank lever mounted on the third of said shafts and having one arm pivoted to the other end of the segment-link, connections between the hand-lever and the other arm of the bell-crank lever for rocking the latter, and a push-bar connecting the hand-lever with the segment-lever at a point intermediate the length of the latter, substantially as described.

4. In a machine of the character described, the combination with the main framework, a group of shafts therein, the movable member, and a connecting-rod pivoted to the latter; of a hand-lever mounted on one shaft, a segment-lever pivoted at one end to said connecting-rod, a segment-link pivoted at one end to the other end of the segment-lever, a bell-crank lever mounted on another of said shafts and having one arm pivoted to the other end of the segment-link, an arm fast on the hand-lever, a link by which said arm is pivotally connected with the other arm of the bell-crank lever for rocking the latter, and a push-bar connecting the hand-lever with the segment-lever at a point intermediate the length of the latter, substantially as described.

5. In a machine of the character described, the combination with the main framework, a group of shafts therein, the movable member, and a connecting-rod pivoted to the latter; of a hand-lever comprising a barrel mounted on one shaft and a projection therefrom carrying a handle, a segment-lever pivoted at one end to said connecting-rod, a link pivotally connecting its other end with another of said shafts, a segment-link pivoted at one end to the swinging end of the segment-lever, a bell-crank lever mounted on the third of said shafts and having one arm pivoted to the swinging end of the segment-link, an arm on the hand-lever extending radially and rigidly from the barrel and spaced longitudinally from the projection thereon, a link by which said arm is pivotally connected with the other arm of the bell-crank lever for rocking the latter, and a push-bar connecting the projection on the hand-lever with the segment-lever at a point intermediate the length of the latter, substantially as described.

6. In a machine of the character described, the combination with the main framework, a group of shafts supported at each end of the framework, the movable member guided in the framework, and connecting-rods pivoted to said movable member; of raising and lowering mechanisms at the ends of the machine, each comprising a hand-lever having a barrel mounted on one shaft, a segment-lever pivoted at one end to one of the connecting-rods, and pivotally connected at its other end with another of said shafts, and a push-bar connecting the hand-lever with the segment-lever at a point intermediate the length of the latter; one of said hand-levers having a handle and both of them having arms projecting from their barrels, and a connecting-bar pivoted to said arms for causing the barrels to turn in unison, substantially as described.

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