

No. 682,113.

Patented Sept. 3, 1901.

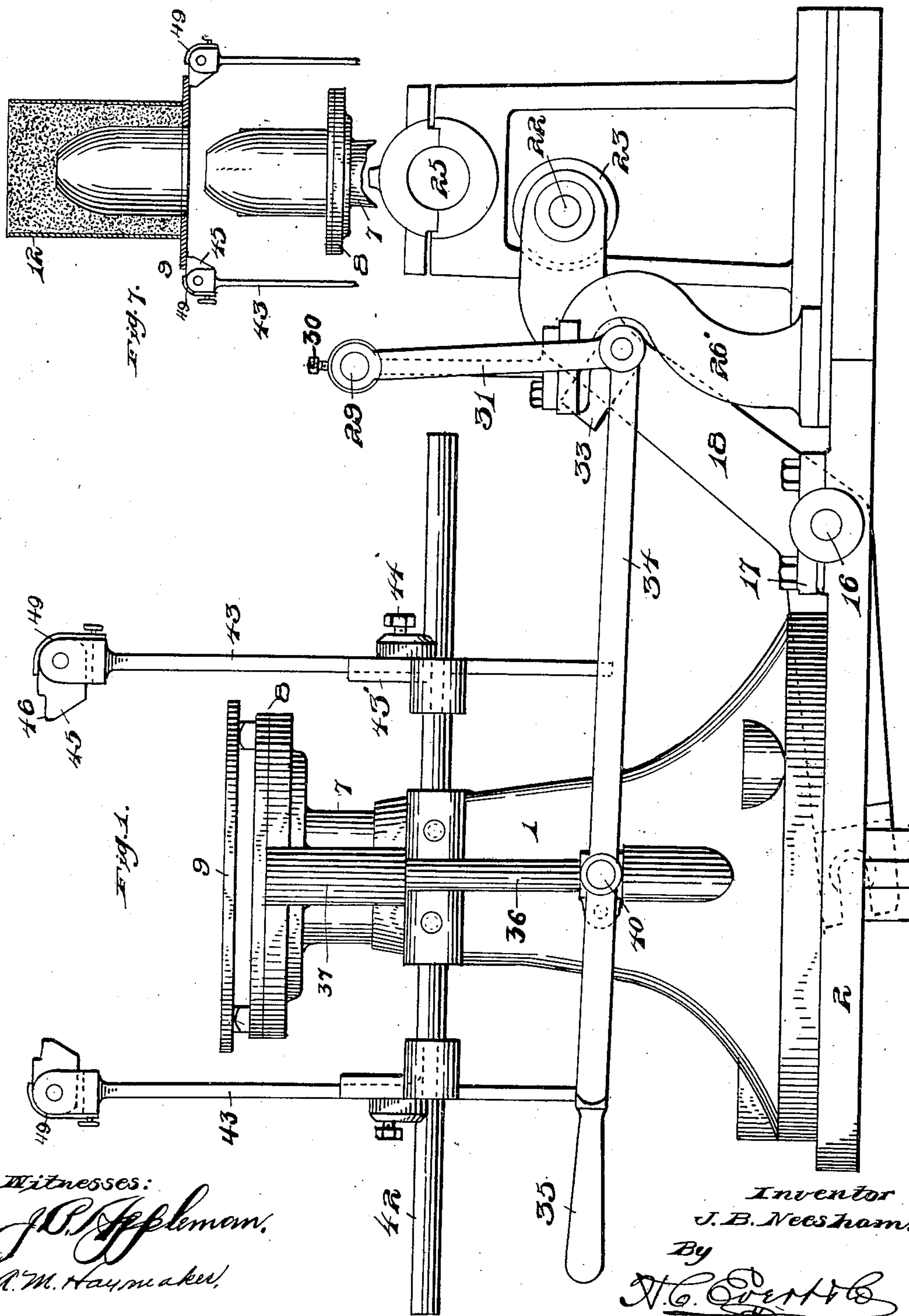
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APPARATUS FOR FORMING SAND MOLDS.

(Application filed Jan. 21, 1901.)

(No Model.)

4 Sheets—Sheet 1.



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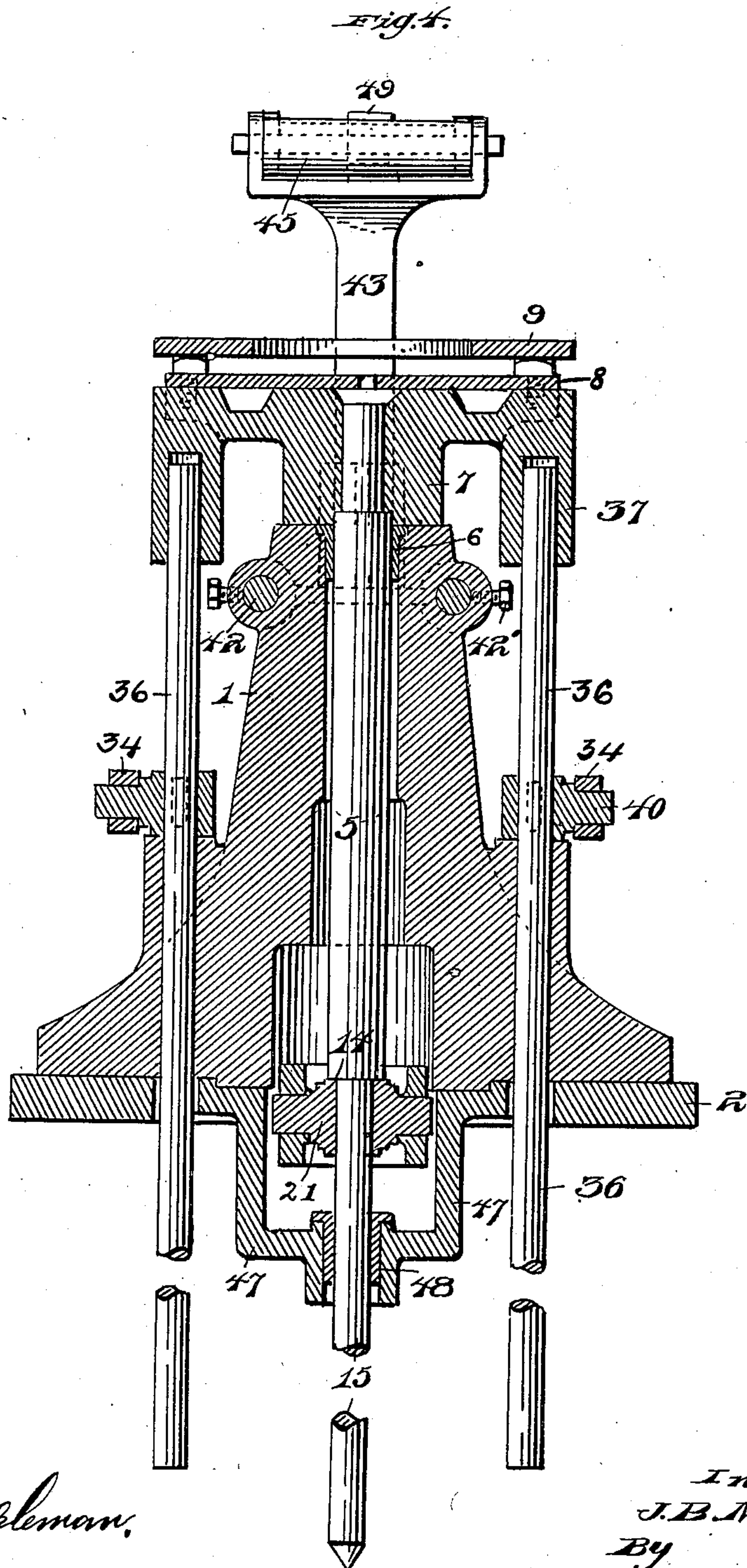
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4 Sheets—Sheet 3.



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4 Sheets—Sheet 4.

Fig. 5.

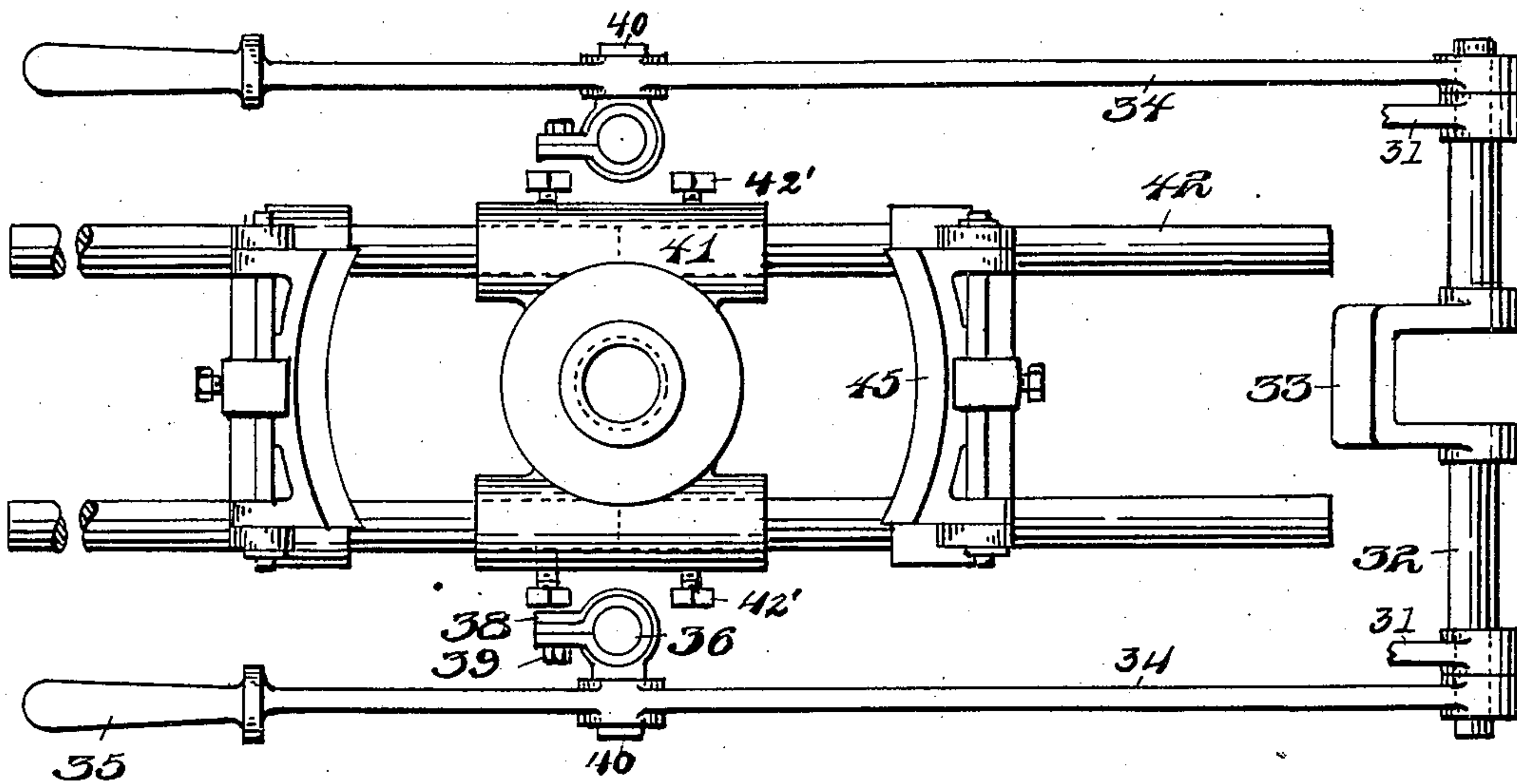
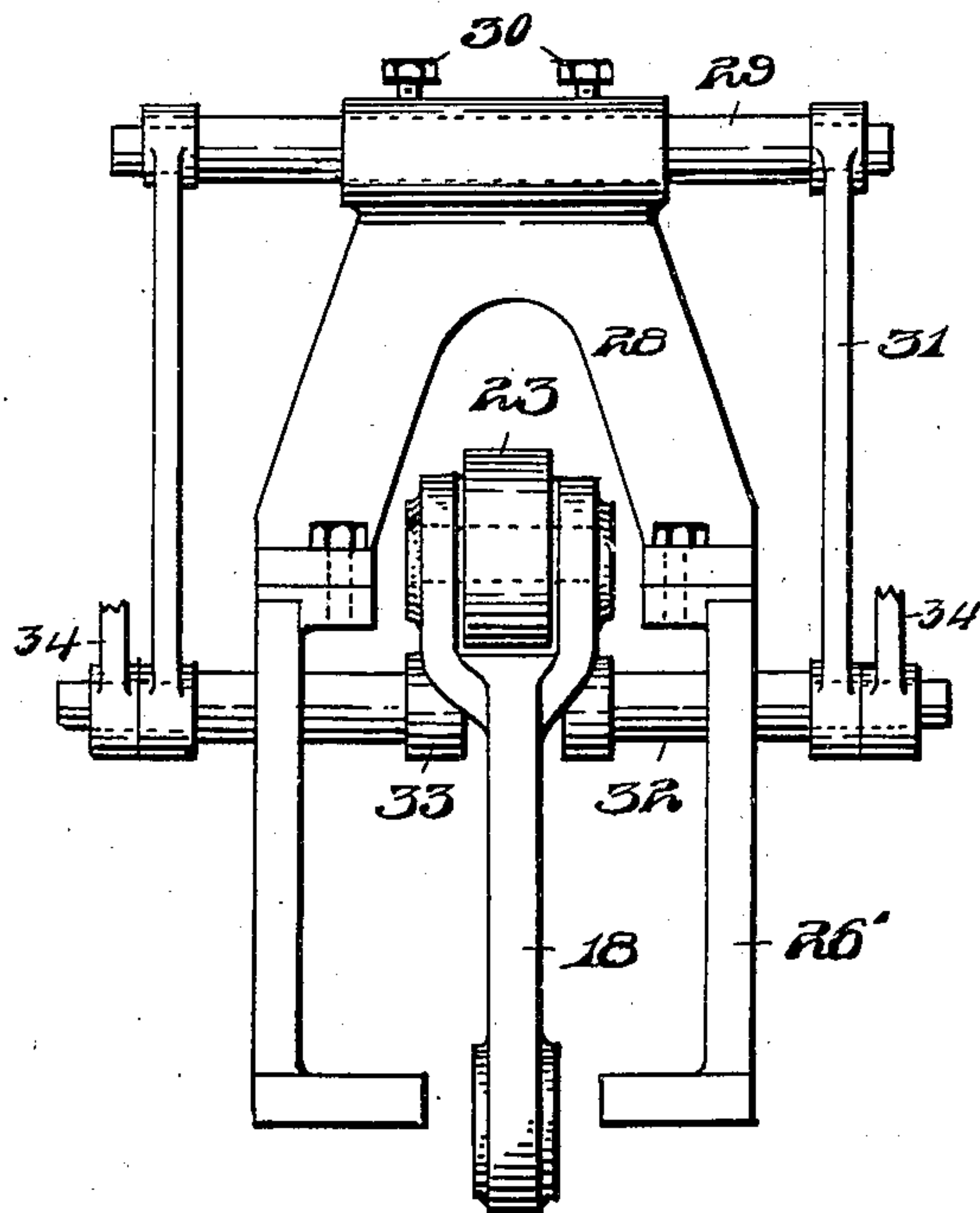


Fig. 6.



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UNITED STATES PATENT OFFICE.

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APPARATUS FOR FORMING SAND MOLDS.

SPECIFICATION forming part of Letters Patent No. 682,113, dated September 3, 1901.

Application filed January 21, 1901. Serial No. 44,103. (No model.)

To all whom it may concern:

Be it known that I, JOHN B. NEESHAM, a subject of the Queen of England, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Apparatus for Forming Sand Molds, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to certain new and useful improvements in molding-machines, and relates particularly to that class of molding-machines in which a vertical reciprocatory movement is imparted to the table carrying the flask to jar the same and firmly pack the sand in the flask in order to form the mold.

The invention has for its object to construct a machine of this class having in connection therewith stripping means by which the flask containing the mold may be supported and the pattern stripped or lowered from the mold; furthermore, to construct a stripping means for this purpose which may be adjusted to conform to different-sized flasks that may be used and which when in position on the machine will in no wise interfere with the convenient or successful operation of the latter.

Briefly described, my invention comprises a jarring-block upon which a vertically-reciprocating table is mounted. The table is connected to a plunger. The vertical shaft is connected to the table and reciprocates through the jarring-block to impart a vertical movement to the table. This plunger or vertical shaft is connected to a lifting-arm, and is in turn given an intermittent motion by means of which jarring of the sand is uniformly accomplished.

Furthermore, my invention comprises adjustable means carried by the machine for engaging the stripping-plate to support the same while the pattern is being stripped from the mold.

My invention further consists in the novel details of construction and combination of parts to be clearly described in the following specification and fully set forth in the claims.

In describing the invention in detail reference is had to the accompanying drawings, forming a part of this specification, and where-

in like numerals of reference indicate corresponding parts throughout the several views, in which—

Figure 1 is a side elevation of my improved molding-machine. Fig. 2 is a vertical longitudinal sectional view of the same. Fig. 3 is a top plan view of a part of the lifting-arm, showing the nut that engages the vertical shaft or plunger. Fig. 4 is a central transverse vertical sectional view of the jarring-block and table, showing a part of one the arms and the pivoted supports for the flask, the guide-rods for the lifting mechanism, and the vertical plunger or operating-shaft for the table partly broken away. Fig. 5 is a detached top plan view of the lifting mechanism for elevating the flask to its support, where the pattern may be stripped therefrom. Fig. 6 is a detached end view of the lifting-arm, showing the bracket, standard, and links for the side lifting-levers. Fig. 7 is a central transverse vertical sectional view of the flask with the mold formed therein and the pattern removed therefrom, the latter being shown in side elevation. Fig. 8 is a central vertical sectional view of the stuffing-box at the lower end of the jarring-block, showing a part of the vertically-reciprocating plunger or shaft in side elevation.

To put my invention into practice, I provide a jarring-block 1, which in the accompanying drawings is shown of a tapering form, with the wide base provided with bolt-holes to receive bolts, by means of which the same may be securely fastened to a suitable base or support 2. This jarring-block is centrally bored, the bore being of a greater diameter in the base of the block, as shown at 3, and opening out to the side of the base in order to form a recess or space in which the lifting-arm may be freely operated. The bore in this jarring-block extends upwardly through the same and is of a diameter slightly greater than that of the vertically-reciprocating plunger or shaft 5 that operates therein in order that the latter may not engage the walls of the bore, and by this means materially reducing the friction. The shaft or plunger 5 operates through the gland or stuffing-box 6, arranged within the upper end of the jarring-block, and this shaft has rigidly secured

to its upper end a table 7, which carries a pattern-plate 8, upon which the stripping-plate 9 is mounted. The pattern-plate 8 is preferably bolted to the table 7, as shown, and the heads of the bolts form a support for the stripping-plate 9. The pattern-plate has secured thereto by means of a screw or bolt 10 or other suitable means a pattern 11, by means of which the mold is to be formed within the sand contained in the flask 12, the latter being supported upon the stripping-plate 9. The stripping-plate is provided with a central opening of sufficient size to receive the pattern 11. The vertical shaft or plunger 5 is provided near its lower end with a shoulder 14, the reduced lower end 15 of said shaft extending downwardly below the base-plate or support 2. A transverse shaft 16 is journaled in suitable bearings 17, mounted on the base-plate or support 2, and mounted on this shaft 16 between the bearings 17 is a somewhat L-shaped lifting-arm 18 for imparting a vertically-reciprocating movement to the shaft or plunger 5, the table 7, and the pattern carried thereby. This is accomplished by providing the end of the arm 18 that projects into the recess 3 with brackets 19, which engage studs 20, carried on opposite sides of the nut 21. This nut is mounted upon the reduced portion 15 of the shaft or plunger 5 and engages the shoulder 14 of said shaft or plunger. The free end of this lifting-arm 18 is bifurcated and has journaled therein a shaft 22, upon which is mounted a follower 23. This follower is adapted to be engaged and an intermittent movement thereby imparted to the lifting-arm by means of a cam 24, which is mounted on the operating-shaft 25, that may be driven by belt over a pulley, (not shown,) or this shaft 25 may be driven in any suitable manner as may be found convenient.

A pair of gooseneck-standards 26' are mounted on the base or support, and bolted or otherwise rigidly secured to the upper ends of these standards is a substantially A-shaped standard 28, having a bearing at its upper end to receive the shaft 29, which may be rigidly secured thereto by the set-screws 30, as shown. This shaft at opposite sides of the standard 28 receives the upper ends of a pair of side links 31, these links at the lower ends being connected to short shafts 32, the inner ends of which are connected to the yoke 33, that spans the lifting-arm 18. This construction is provided in order to give sufficient clearance for the lifting-arm during its operation. The ends of the shaft 32 project beyond the side legs 31 in order that they may receive the ends of the side lifting-levers 34, these levers being provided at their opposite ends with suitable handles 35 and being connected to a pair of guide-rods 36, arranged vertically of the jarring-block and operating through this block and through the base, and at the upper ends extending into posts 37, provided therefor in the table.

The connection between the side lifting-levers 34 and the guide-rods is preferably made adjustable in order that these lifting-levers may be elevated or lowered, as may be desired, by the person operating the machine, as the particular location of the side lifting-levers where they might be convenient for one operator might not be convenient for another. In practice I have used a convenient form of adjustable connection, which I have shown in the drawings. This connection consists of a strap 38, which encircles the guide-rods 36, the ends of the same being brought tightly together and fastened by a set-screw 39. This strap carries an outwardly-projecting stud or pin 40, which is adapted to engage in the eye provided therefor in the side lifting-levers. The jarring-block is provided on opposite sides with sleeve-shaped enlargements 41, which form bearings to receive the supporting-rods 42, held therein by set-screws 42', and upon said supporting-rods the arms 43 are adjustably supported. These arms are adapted to be moved vertically within the slides 43', in which they are rigidly held in the adjusted position by means of the set-screws 44. The slides 43 are mounted on the rods or shafts 42 and are slidable thereon, so that the arms 43 may be moved toward or away from each other in order to accommodate different-sized flasks. These arms 43 have pivoted in their upper ends a support 45, which during the operation of the machine lies normally in the position shown in Figs. 1, 2, 4, and 5 and in the position where the stripping-plate 9 upon being elevated by the side lifting-levers will engage these supports and move the same outwardly as the flask passes upwardly between the supports until such plate has passed out of engagement therewith, at which time upon the table being lowered the stripping-plate will engage upon the shoulder and upper faces 46 of the supports and be supported in this position while the table and pattern continue to descend, thus supporting the flask while the pattern is stripped therefrom, as shown in Fig. 7 of the drawings.

As the bore of the jarring-block 1 is of a greater diameter than the vertically-operating shaft or plunger 5, so that the latter will not engage with the walls of the bore, I preferably provide below the jarring-block a suitable gland 47, which may be formed integral with the base or support 2 or connected thereto and which has a stuffing-box 48 to receive the lower end of the vertically-operating shaft or plunger 5 in order to guide the same in its movement, the only friction upon this shaft in this construction being where the same operates through the stuffing-box 48 and through the stuffing-box or gland 6 in the bore of the jarring-block, at the upper end thereof.

In operation the flask 12 is placed in position upon the stripping-plate 9, as shown in Fig. 2 of the drawings, and the sand or

other material in which the mold is to be made is placed within the flask and the machine operated. Upon motion being imparted to the drive-shaft 25 the cam 24, carried by said shaft, engages the follower 23, depressing this end of the lifting-arm 18 and elevating the opposite end thereof, and by reason of the nut 21 engaging on the shoulder 14 elevating the vertical plunger or shaft, which carries with it the table, pattern, stripping-plate, and flask, and as the cam 24 passes out of engagement with the follower 23 the support for the vertically-reciprocating parts is thereby removed, and these parts descend and the table striking against the top of the jarring-block jars the sand within the flask, so as to form the mold according to the shape of the pattern being used. When the mold has been completed and it is desired to strip the pattern therefrom, the side levers 34 are raised, which carries the guide-rods 36 upwardly, these guide-rods carrying therewith the table and parts mounted thereon, and as the stripping-plate comes in contact with the pivoted supports 45 these supports are swung backward on their pivot-pins sufficiently to permit the stripping-plate to pass above the same, when they return to their normal positions, in which they will be engaged by the stripping-plate as the table is lowered, and thus support the flask while the pattern is stripped therefrom.

It will be observed that the side handles being adjustable they may be placed in a position convenient for the operator, and the slides 43 being adjustable upon the side rods 42, together with the arms 43, being adjustable vertically in the slides, that these arms may be adjusted either toward or away from each other, or vertically in the latter case, to place the supporting-dogs at a different height, as may be required by the size of flask being employed.

To insure the return of the dogs or supports 45 to the supporting position after the flask has passed above the same, I provide a spring 49, that may be fastened to the arm 43 in a position where it will be engaged by the support as the latter is moved outward and exert its tension against the support to return the same to its normal or supporting position.

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

1. In a molding-machine, the combination of a jarring-block, a vertical reciprocating plunger or shaft operating therein, said shaft having a reduced portion thereon forming a shoulder, a table carried by the said plunger or shaft above the jarring-block and adapted to engage the upper end of the latter, a stripping-plate carried by the said table, a pattern connected thereto and projecting through the stripping-plate, an L-shaped lifting-arm secured in suitable bearings, brackets made integral with one end of said arm, an aper-

tured nut secured between said brackets, said nut being mounted upon the said reduced portion and engaging the said shoulder thereon, the other end of said lifting-arm being bifurcated, a follower mounted in said bifurcation, a drive-shaft, and means actuated by the drive-shaft for engagement with the arm to actuate the same and to impart an intermittent motion to the plunger or shaft and table, substantially as described.

2. In a molding-machine, the combination of a jarring-block, a vertical reciprocating plunger or shaft operating therein, said shaft having a reduced portion thereon forming a shoulder, a table carried by the said plunger or shaft above the jarring-block and adapted to engage the upper end of the latter, a stripping-plate carried by the said table, a pattern connected thereto and projecting through the stripping-plate, an L-shaped lifting-arm secured in suitable bearings, brackets made integral with one end of said arm, an apertured nut secured between said brackets, said nut being mounted upon the said reduced portion and engaging the said shoulder thereon, the other end of said lifting-arm being bifurcated, a follower mounted in said bifurcation, a drive-shaft, and a cam on the drive-shaft for engagement with the follower on the said lifting-arm to actuate the same and to impart an intermittent motion to the plunger or shaft and table, substantially as described.

3. In a molding-machine, the combination of a jarring-block, a plunger or shaft arranged to reciprocate vertically therein, a table carried by said shaft above the jarring-block, a pattern connected to said table, a stripping-plate mounted on said table to receive the flask in which the mold is to be formed, a lifting-arm engaging the plunger or shaft, a drive-shaft, means actuated by the said drive-shaft, for giving said arm an intermittent motion, and adjustable means for engagement with the stripping-plate to hold the flask and stripping-plate suspended while the pattern is stripped therefrom and the said stripping-plate is out of engagement with the said table, substantially as described.

4. In a molding-machine, the combination with a jarring-block, a plunger or shaft arranged to operate vertically therein, a table carried by the said shaft above the jarring-block, a pattern connected to said table, a flask mounted on said table, and a lifting-arm engaging said shaft, a drive-shaft, a cam mounted thereon, and adjustable means carried by the jarring-block for engagement with the stripping-plate to hold the flask and stripping-plate suspended while the pattern is stripped from the flask, substantially as described.

5. In combination, a jarring-block, a shaft arranged to reciprocate therein, a table carried by said shaft, a pattern mounted on the table, a flask carried by the table, an operating-shaft, a lifting-arm for actuating the said

first-named shaft, means carried by the operating-shaft for imparting motion to the table and shaft, and adjustable means carried by the jarring-block for engagement with the stripping-plate to hold the flask and stripping-plate suspended while the pattern is stripped from the flask, substantially as described.

6. In a molding-machine, the combination with a jarring-block, a plunger or shaft, a table carried by the plunger or shaft, an L-shaped lifting-arm engaging the shaft for actuating the same, an operating-shaft, means actuated by the operating-shaft for intermittently operating said lifting-arm, and adjustable means for holding the flask out of engagement with the table when the pattern is stripped from the flask, substantially as described.

7. In a device of the character described, a base, a jarring-block mounted thereon, said jarring-block being provided with a central bore, a shaft or plunger mounted therein, a table carried by said shaft or plunger, an L-shaped arm, said arm being secured in suitable bearings, and movably connected to said shaft or plunger, an operating-shaft, a cam carried thereby, said L-shaped arm being bifurcated, a follower mounted in said bifurcation and adapted to be engaged by the said cam, in combination with rods or shafts secured on opposite sides of the said jarring-block, adjustable arms mounted thereon, supports secured to said arms, guide-rods connected to the said table and means for operating the said guide-rods, substantially as described.

8. In a molding-machine, a base, a jarring-block mounted thereon, said jarring-block having a central bore formed therein, a shaft or plunger mounted therein, a table carried thereby, an L-shaped arm, said arm being secured in suitable bearings and movably connected to said shaft or plunger, an operating-shaft, means actuated by said shaft for giving said arm an intermittent motion, in combination with rods or shafts secured on opposite sides of the said jarring-block, adjustable arms mounted on said rods or shafts, supports secured to said arms, guide-rods connected to the said table, and levers connected to said guide-rods, substantially as described.

9. In a molding-machine, a base, a jarring-block mounted thereon, said jarring-block being provided with a central bore, a shaft or plunger mounted therein, a table carried by said shaft or plunger, a lifting-arm secured in suitable bearings and connected to said shaft or plunger, an operating-shaft, a cam

carried thereby to actuate said lifting-arm, in combination with rods or shafts secured on the said jarring-block, arms mounted on said rods or shafts, supports secured to said arms, guide-rods connected to the said table, and levers connected to said guide-rods, substantially as described.

10. In a device of the character described, the combination of a jarring-block provided with a central bore, a shaft or plunger mounted therein, a table carried thereby, a lifting-arm connected to said shaft or plunger at its lower end, said arm being secured in suitable bearings, an operating-shaft, means for actuating the said shaft by giving the said arm an intermittent motion, rods or shafts carried by said jarring-block on opposite sides, adjustable arms mounted on said rods or shafts, supports secured to said arms, and guide-rods connected to the said table, and levers pivotally secured to the said guide-rods, substantially as described.

11. In a molding-machine, a base, a jarring-block mounted thereon, said jarring-block having a central bore formed therein, a shaft or plunger mounted therein, a table carried thereby, said table being provided with perforated posts, an L-shaped arm, said arm being pivoted on said base and movably connected to said shaft or plunger, an operating-shaft, means actuated by said shaft for giving said arm an intermittent motion, rods or shafts secured on said jarring-block, adjustable arms mounted on said rods or shafts, supports secured to said arms, guide-rods mounted in the said perforated posts, and means for actuating said guide-rods, substantially as described.

12. In a molding-machine, the combination of a jarring-block provided with a central bore, a shaft arranged to reciprocate therein, a table carried by said shaft, a pattern carried by the table, a flask mounted thereon, an L-shaped lifting-arm connected to said shaft, a drive-shaft, means actuated by the drive-shaft for giving said arm an intermittent motion, adjustable means carried by the jarring-block for engagement with the stripping-plate to hold the flask and stripping-plate suspended while the pattern is stripped from the mold, and means carried by the jarring-block for stripping said pattern from the mold, substantially as described.

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

JOHN B. NEESHAM.

Witnesses:

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A. M. WILSON.