

M. L. HEYL & J. J. LAWLOR.
MOLDING MACHINE.

APPLICATION FILED SEPT. 13, 1909.

Patented Aug. 30, 1910.

2 SHEETS—SHEET 1.

968,560.

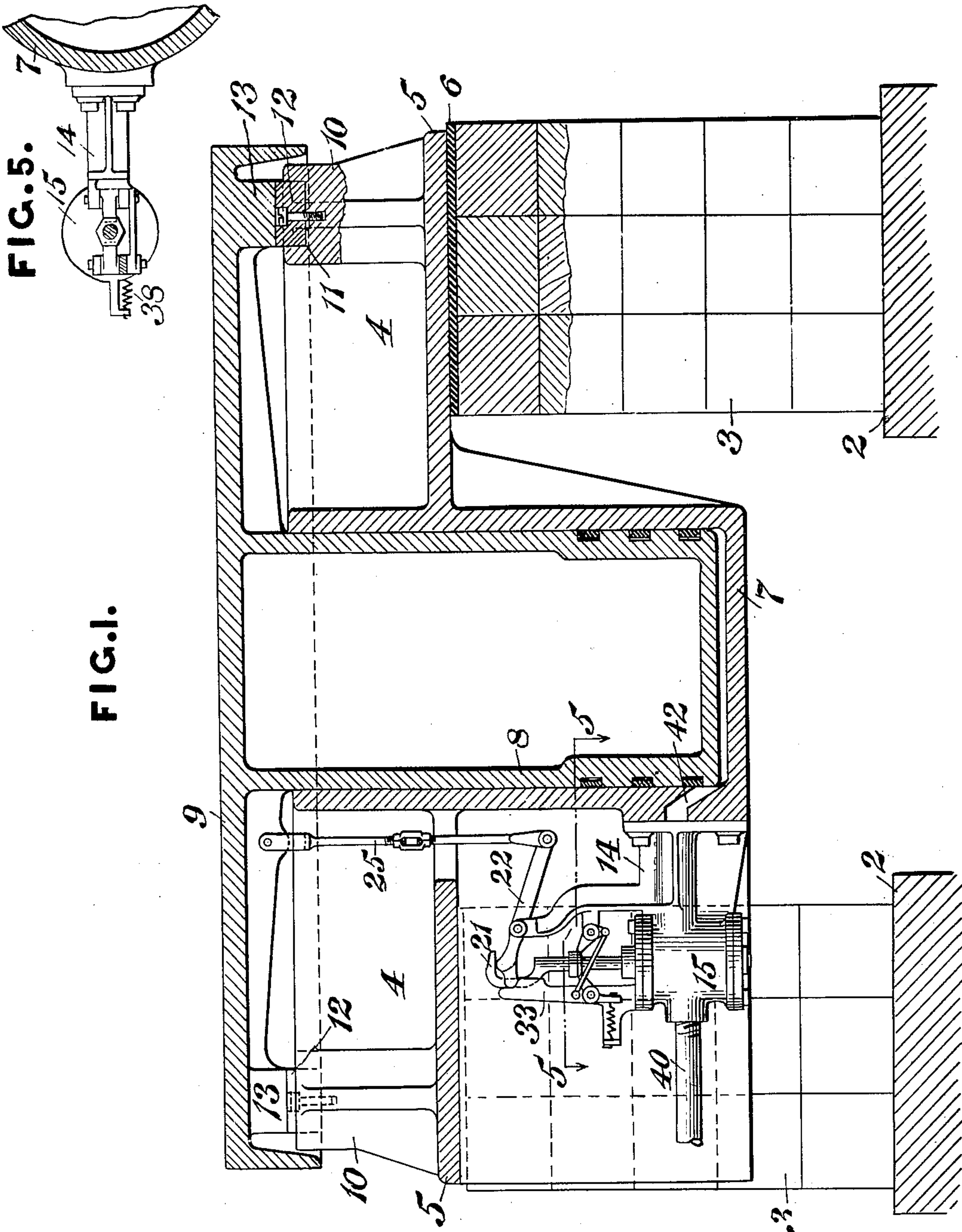


FIG. 1.

FIG. 5.

WITNESSES.

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MOLDING MACHINE.

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2 SHEETS—SHEET 2

WITNESSES.

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UNITED STATES PATENT OFFICE.

MARTIN L. HEYL AND JOHN J. LAWLOR, OF ZELIENOPLE, PENNSYLVANIA.

MOLDING-MACHINE.

968,560.

Specification of Letters Patent. Patented Aug. 30, 1910.

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To all whom it may concern:

Be it known that we, MARTIN L. HEYL and JOHN J. LAWLOR, residents of Zelienu-
ple, in the county of Butler and State of
5 Pennsylvania, have invented a new and use-
ful Improvement in Molding-Machines; and
we do hereby declare the following to be a
full, clear, and exact description thereof.

Our invention relates to molding ma-
10 chines and more particularly to that type in
which the flask containing the patterns is
jarred so as to distribute the sand evenly
and compactly around the pattern in the
flask.

15 The object of our invention is to provide
a machine of this character which is simple
and durable in construction and in which
the valve mechanism for raising a plunger
to the table is operated automatically, in a
20 quick and efficient manner and at the same
time is simple in construction so that it is
not liable to get out of order.

To these ends our invention comprises the
novel features hereinafter set forth and
25 claimed.

In the drawings Figure 1 is a sectional
elevation of our improved machine; Fig. 2
is an enlarged sectional view of the valve
mechanism in elevation; Fig. 3 is a view
30 showing the valve mechanism released; Fig.
4 is a plan view of same; Fig. 5 is a cross
section on line (5—5) Fig. 1.

In the drawings, the numeral 2 designates
a suitable foundation of concrete or other
35 material upon which the timbers 3 are sup-
ported. These timbers form the support
for the frame 4. This frame 4 has the plate
5 which rests upon the timbers 3, and inter-
posed between said plate and said timbers
40 is the rubber or like elastic pad 6, which
provides the proper resiliency when the ma-
chine is in action. The frame 4 has the cyl-
inder 7 to receive the plunger 8 of the table
9. At intervals on the plate 5 of the frame
45 4 are the posts or uprights 10 provided with
the seats 11, within which the jarring blocks
12 are removably secured, said blocks pro-
jecting above the posts 10. The table 9 has
the studs or projections 13 which are adapt-
50 ed to engage the blocks 12. These blocks 12
may be formed of hardened steel and pos-
sess great durability. Being freely remov-
able, they may be replaced from time to
time if they become worn. Furthermore

said blocks may be raised or lowered by the 55
use of shims so as to have a perfect level.

Bolted or otherwise secured to the frame
4 is the bracket 14 which supports the valve-
mechanism. This valve-mechanism com-
prises the cylinder 15 within which is the 60
piston-valve 16 with the annular groove 17.
The stem 18 is connected to the valve 16,
said stem passing out through the upper end
of the cylinder 15. In addition to the stem
18, there is the lower sub-stem 19 which en- 65
gages a guide 20 in a spider 20^a, and in this
manner the valve is guided above and be-
low. The piston-valve 16 has the spider
16^a forming the passages 16^b extending
through the valve and forming communica- 70
tion between the upper and lower ends of
the cylinder 15. The lower end of the cyl-
inder 15 communicates with the atmosphere
by reason of the spider 20^a.

The upper end of the valve-stem 18 has 75
the hook-like portion with the inwardly
projecting portion 21. Arm 22 is pivoted
at 23 to the bracket 14, and the outer end
of said arm has the lug 24 which engages
the lower face of the projecting portion 21 80
of the valve-stem. The outer end of the
arm 22 is connected by the rod 25 to the
table 9. The turn-buckle 26 may be in-
serted in the rod 25 for purposes of adjust-
ment. On the stem 18 is the nut 27 which 85
has the beveled face 28. A dog 29 is piv-
oted at 30 to the bracket 14. A second dog
31 is pivoted opposite the dog 29 upon the
bracket 32 supported from the cylinder 15.
An arm 33 is mounted on the pin supporting 90
the dog 31 and the upper end of said arm
has the cam 34 with which the nose 35 of
the arm 22 is adapted to engage. The nose
35 normally engages the face 36 above the
cam-portion 34 of the arm 33. 95

The link 37 is connected to the arm 33
and to the dog 29. The upper ends of the
dogs 29 and 31 normally engage the bev-
eled face 28 of the nut 27 and support the
valve-stem in its raised position. A spring 100
38 is connected to the lower end of the dog
31 to the bracket 32.

A spring 39 is interposed between the
head of the cylinder 15 and the piston valve
16. The cylinder 15 has the inlet pipe 40 105
which admits the motive fluid to the annu-
lar space 17 of the piston valve 16, and the
passage 41 leads from the cylinder 15 to the

port 42 leading to the lower end of the cylinder 7.

When our improved molding machine is in use, the mold containing the patterns in the sand is placed upon the table 9, and the parts of the valve-mechanism will be in the position indicated in full lines Fig. 2. Air or other motive fluid is admitted by the inlet 40 to the cylinder 15 and said motive fluid upon entering the annular groove 17 will pass from said groove into the passage 41 and thence by the port 42 to the lower end of the cylinder 7. The plunger 8 within the cylinder 7 will be raised and the table 9 with it. As the table 9 ascends the rod 25 will raise the inner end of the lever 22, and the outer end of said lever will be correspondingly lowered. As the outer end of said lever is lowered, the nose 35 thereof travels along the face 36 of the arm 33, until said nose reaches the cam portion 34, whereupon the arm 33 will be moved outwardly to the position indicated in the dotted lines Fig. 2 or full lines Fig. 3. This outward movement of the arm 33 acts to move the dog 31 from engagement with the nut 28 and through the link 37 the dog 29 will be simultaneously moved out of engagement with the nut 27 and this will give the spring 39 opportunity to lower the piston-valve 16 and the valve-stem 18 to the position indicated in Fig. 3. Before, however, the valve is lowered to this extent, the table 9 will have reached the extent of its upper stroke, and when the dogs 29 and 31 are released, the descent of the valve will cut off the supply of motive fluid to the cylinder 7, and the weight of the table 9 and the mold carried thereon, will cause said table to descend of its own weight. The exhaust from the lower end of the cylinder 7 taking place through the port 42, passage 41 into the cylinder 15 and down through the hollow piston-valve and out through the openings in the spider 20^a at the lower end of said cylinder. By having the piston valve with the passage extending through it communicating with the atmosphere a vacuum is prevented. The table 9 descends as above stated of its own weight, and consequently with considerable velocity, so that the studs 13 of said table will strike the blocks 12 with considerable force so as to jar the sand within the mold and tend to pack it tightly around the patterns. The jar occasioned by the descent of the table 9 in this way, is to a certain extent, taken up by the rubber pad 6 which relieves the strain on the machine and the valve-mechanism carried thereby. At the same time the table 9 has its impact directly upon the hard blocks 12, which will tend to give a greater jarring action to the sand within the molds and pack the same with greater effectiveness. When the table descends in this way, the rod 25 will be

lowered and the lug 24, being in engagement with the projecting portion 21 of the valve-stem, will act to lift the valve-stem and valve until the nut 27 carried by the valve-stem passes above the upper ends of the dogs 29 and 31, whereupon the spring 38 will act to throw the dogs into engagement with the nut 27 and so hold the valve in its raised position to again admit the motive fluid to the lower end of the cylinder 7.

The jarring strokes take place in quick succession and the valve-mechanism acts with great accuracy and precision. The parts of the valve-mechanism are few and simple in construction, so that valve-mechanism is not liable to get out of order, and the repairs are accordingly reduced to a minimum. By the employment of the hollow piston valve the exhaust from the cylinder 7 passes down through said valve and through the open end of the cylinder 15. The descent of the piston-valve does not create a vacuum and consequently it does not suck or draw in the sand or other gritty material which is floating in the atmosphere and which is very injurious to the packing and other parts of the valve-mechanism.

What we claim is:

1. In a molding machine, combination with suitable frame, of a cylinder, a table, a plunger on said table engaging said cylinder, a spring actuated piston valve controlling motive fluid supply to said cylinder, a valve-stem, dogs engaging said valve-stem, a movable arm connected to one of said dogs, connections between said dogs for simultaneous operation of same, and means for moving said arm by the movement of said table to release said dogs.

2. In a molding machine, combination with suitable frame, of a cylinder, a table, a plunger engaging said cylinder, a spring actuated piston-valve controlling the supply of motive fluid to said cylinder, a valve-stem, locking dogs engaging said valve-stem, a cam-arm connected to one of said dogs, connections between said dogs for simultaneous movement thereof, a lever engaging said cam-arm, and connections between said lever and said table.

3. In a molding machine, combination with a suitable frame, of a cylinder, a table, a plunger engaging said cylinder, a spring actuated piston-valve controlling supply of motive fluid to cylinder, a valve-stem, dogs engaging said valve-stem, connections between said dogs for the simultaneous operation of same, a cam-arm connected with one of said dogs, a lever engaging said cam-arm and said valve-stem, and connections between said lever and said table.

4. In a molding machine, combination with suitable frame, of a cylinder, a table, a plunger engaging said cylinder, a spring

actuated piston valve controlling the supply of motive fluid to said cylinder, a valve-stem, a nut on said valve-stem having beveled faces, a dog engaging said beveled
5 faces, and means for releasing said dog by the movement of said table.

5. In a molding machine, combination with a suitable frame, of a cylinder, a table,
10 a plunger engaging said cylinder, a spring actuated piston-valve controlling supply of motive fluid to said cylinder, a valve-stem, a locking-dog engaging said valve stem, a

cam-arm connected to said dog, a lever engaging said cam-arm and connections between said lever and said table.

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In testimony whereof, we the said MARTIN L. HEYL and JOHN J. LAWLOR have hereunto set our hands.

MARTIN L. HEYL.
JOHN J. LAWLOR.

Witnesses:

E. R. JOSHUA,
J. W. DAVIS.