

No. 706,487.

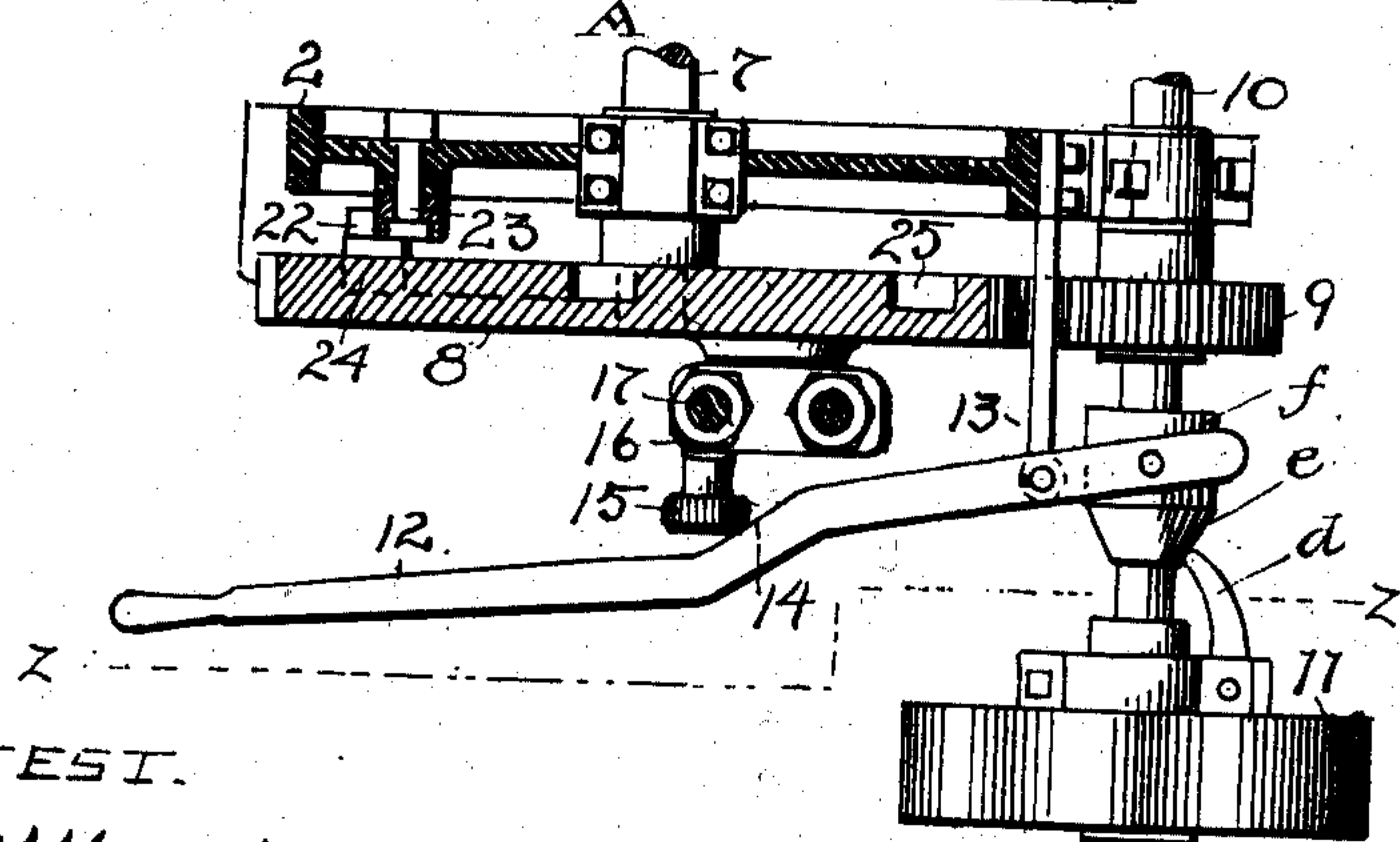
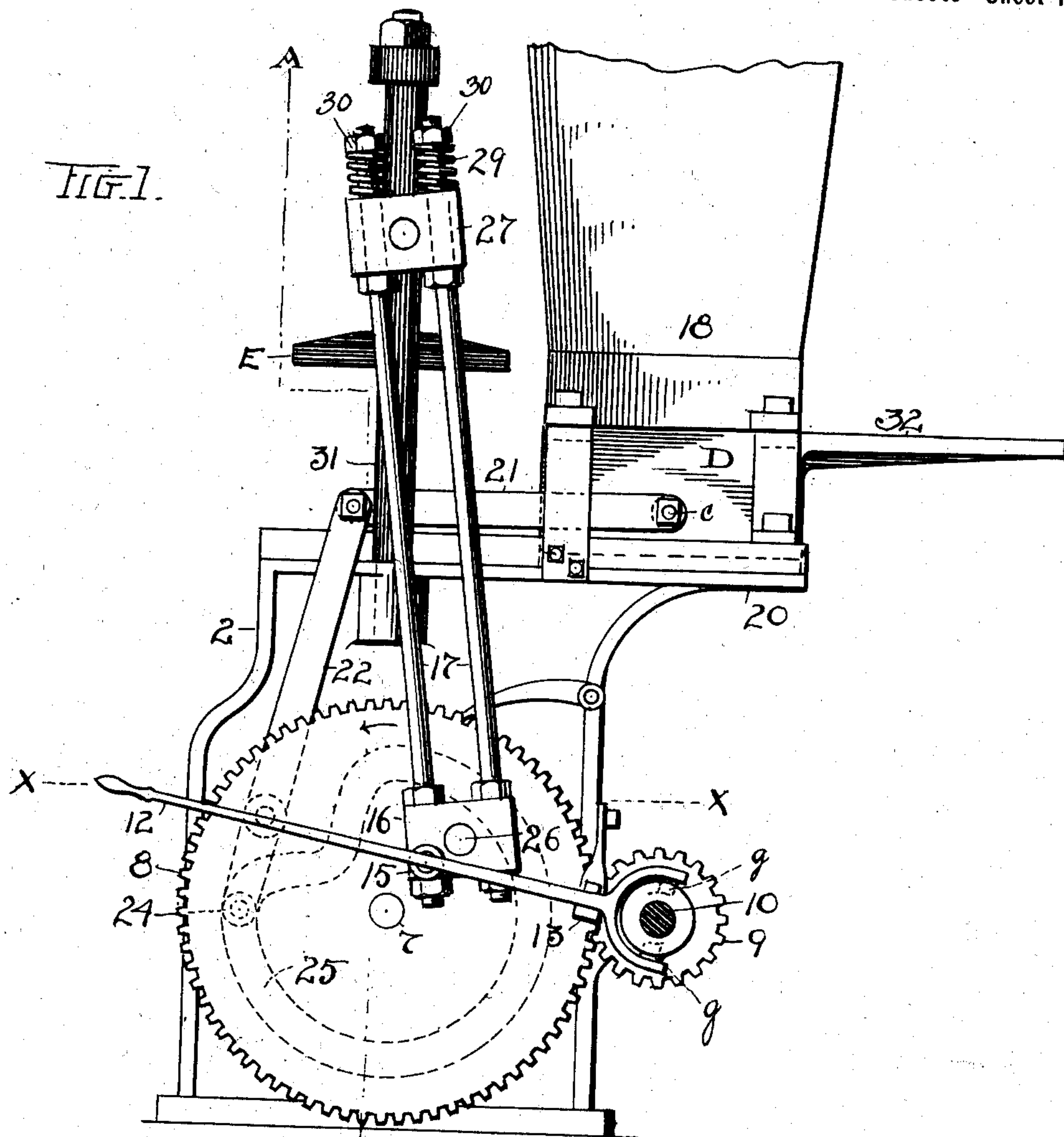
Patented Aug. 5, 1902.

J. N. BATTENFELD.
MACHINE FOR MOLDING.

(Application filed Aug. 24, 1901.)

(No Model.)

3 Sheets—Sheet 1.



ATTEST.

T. B. Moser
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INVENTOR.

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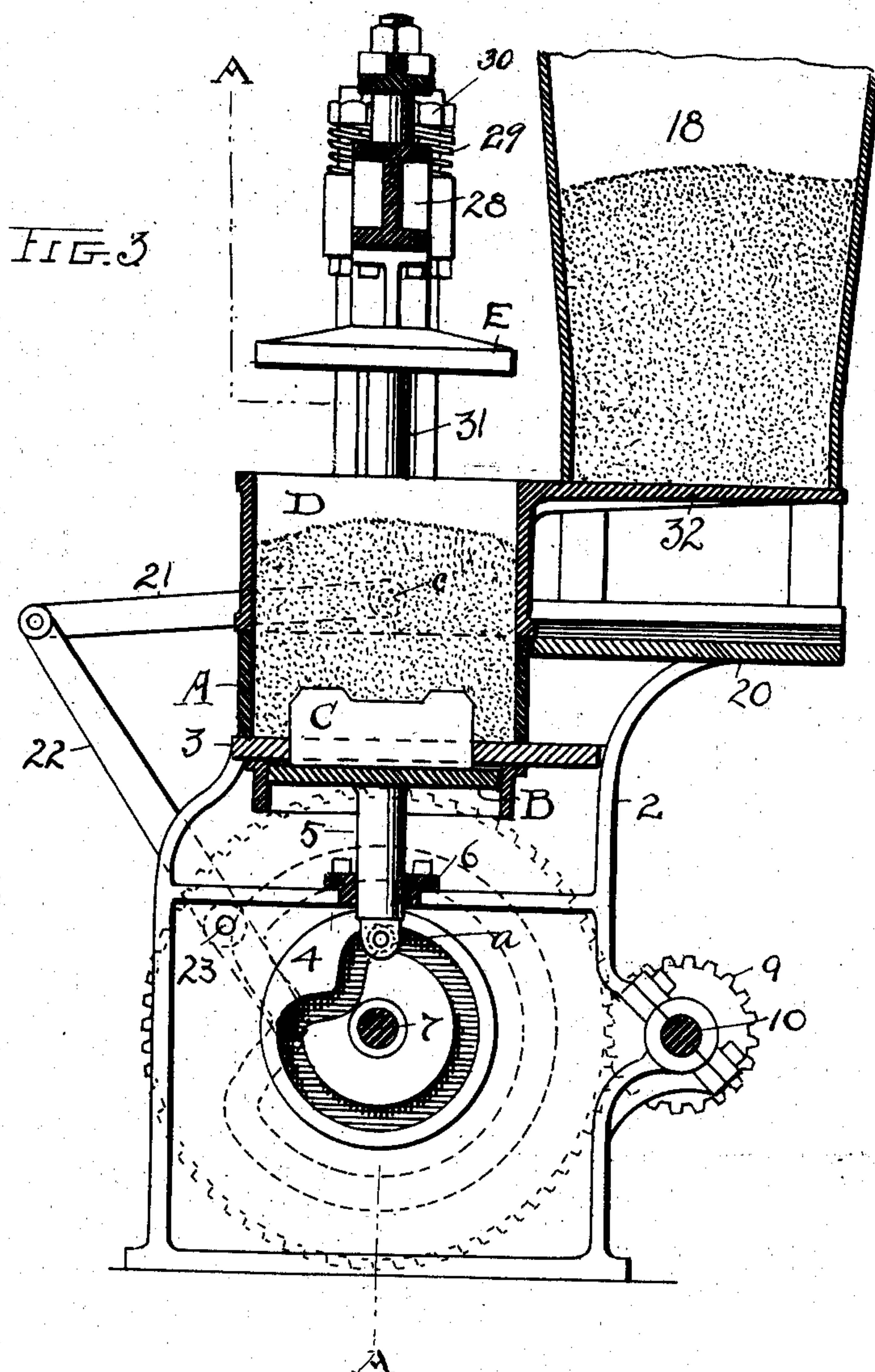
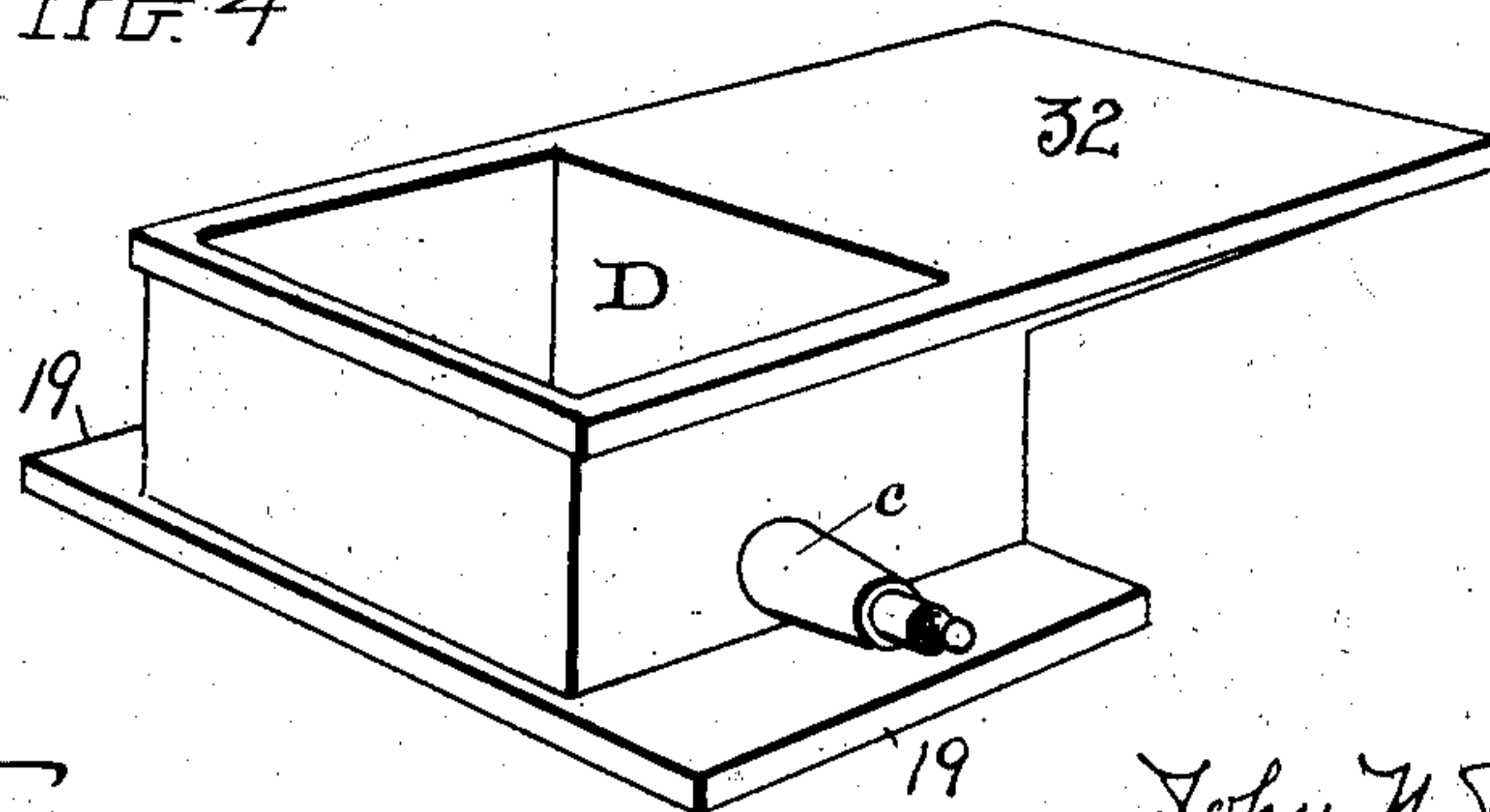


FIG. 4



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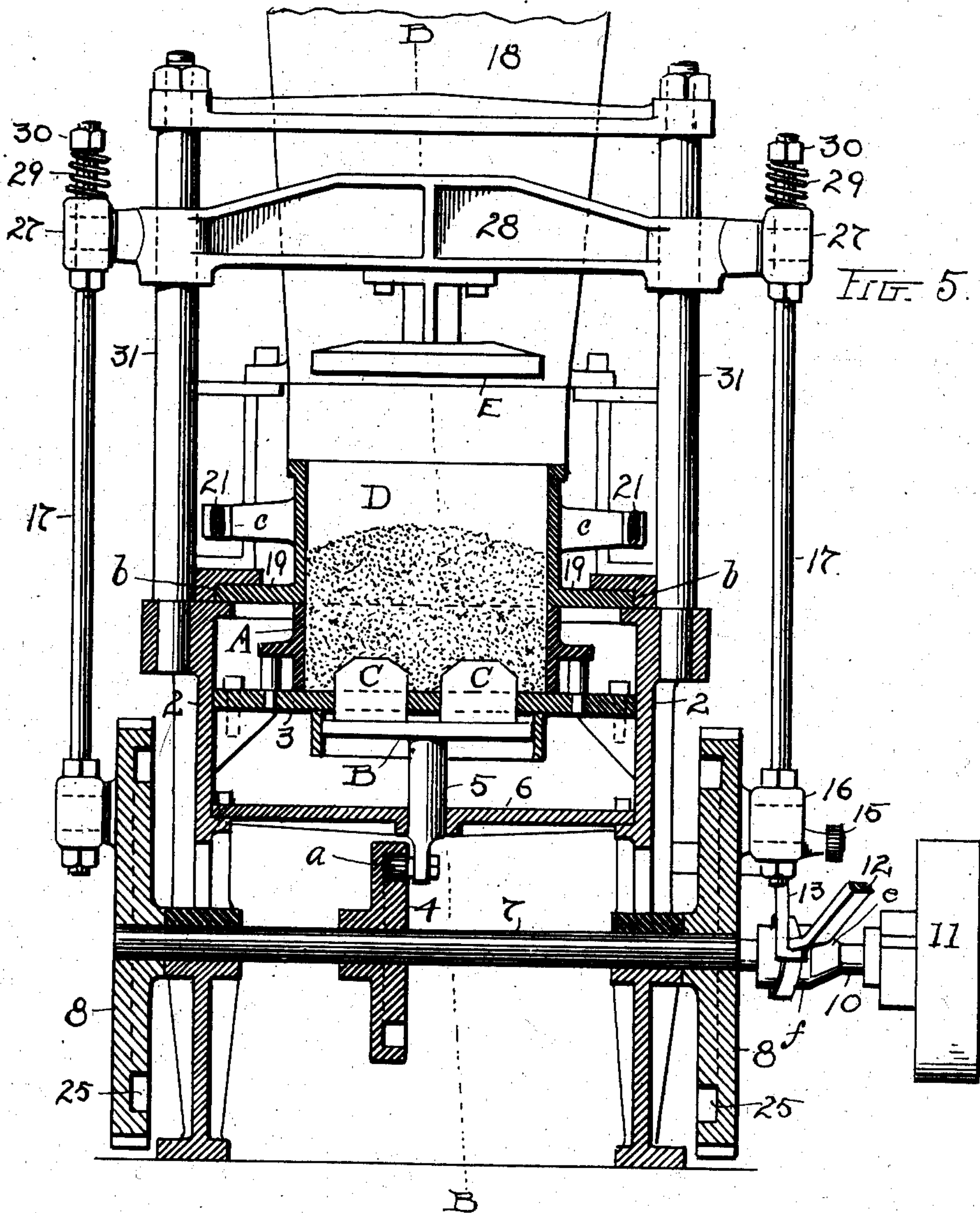
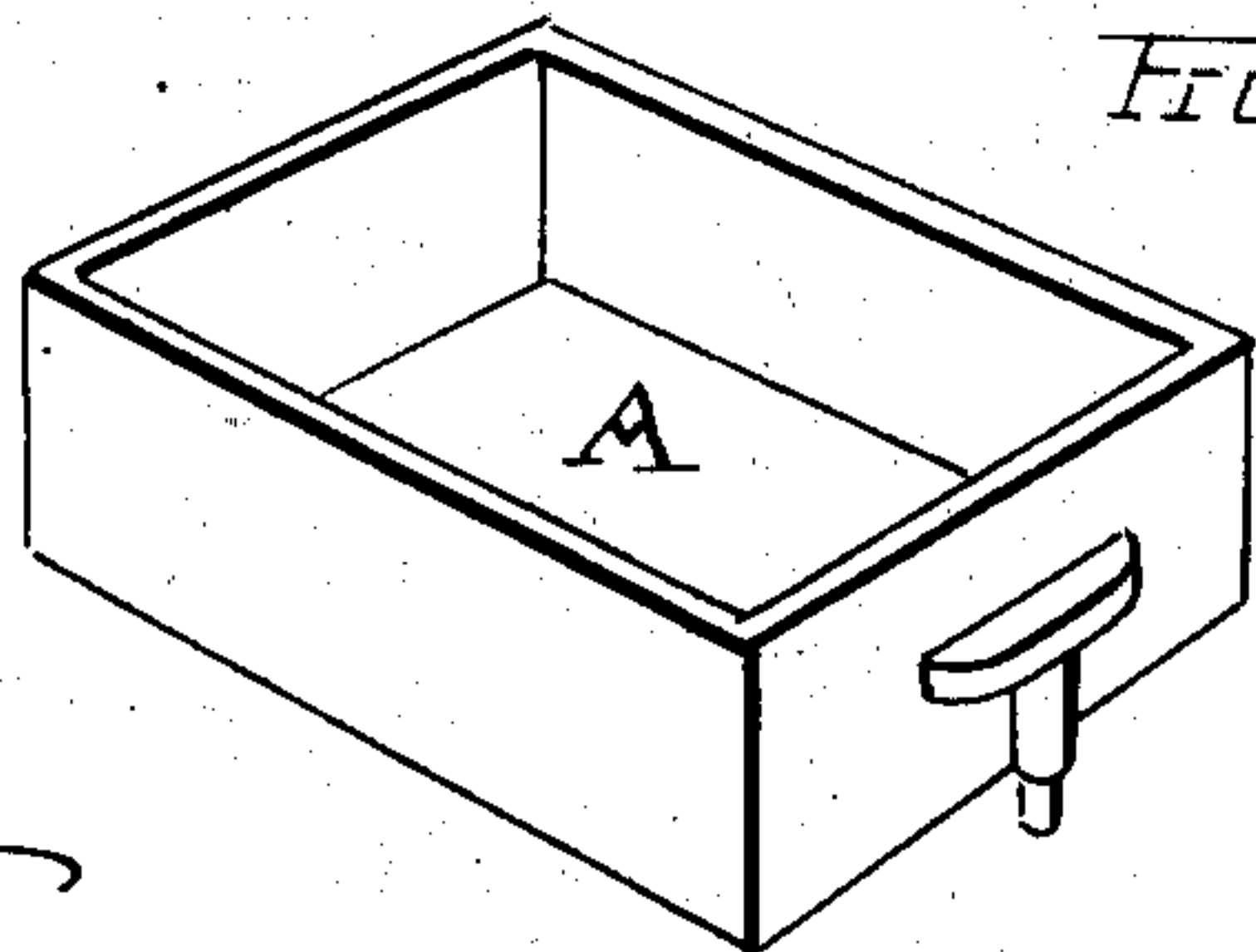


FIG. 6.



ATTEST
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UNITED STATES PATENT OFFICE.

JOHN N. BATTENFELD, OF CLEVELAND, OHIO, ASSIGNOR TO THE CLEVELAND AUTOMATIC MOULDING MACHINE COMPANY, A CORPORATION OF OHIO.

MACHINE FOR MOLDING.

SPECIFICATION forming part of Letters Patent No. 706,487, dated August 5, 1902.

Application filed August 24, 1901. Serial No. 73,143. (No model.)

To all whom it may concern:

Be it known that I, JOHN N. BATTENFELD, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Machines for Molding; and I do declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to machines for molding in sand as applied with the usual flask and patterns; and the object of the invention is to provide means whereby the flask is filled with sand and the same then tamped or rammed about the pattern, after which the pattern is withdrawn, all of these operations being performed mechanically while the machine is in motion and as hereinafter shown and described, and more particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation of my improved machine with the parts at rest as at the end of each operation. Fig. 2 is a sectional plan view, taken on line X X, Fig. 1, of the rear side of the frame and showing more particularly the mechanism for starting and stopping the machine. Fig. 3 is a central sectional elevation on line B B, Fig. 5, with the sand-feed box brought forward over the flask. Fig. 4 is a perspective view of the feed-box alone. Fig. 5 is a front sectional view on line A A, Fig. 3. Fig. 6 is a perspective view of a flask adapted to be used with this machine.

Briefly stated, the operation of molding with this machine is divided into three separate but associated steps, which are defined as follows: first, the placing of the pattern into position and the withdrawal of the same after the molding has been accomplished; second, the filling of the flask with sand about the pattern, and, third, the tamping or ramming of the sand to make a perfect mold. All of these operations are performed mechanically after a flask A is placed in position, and the main advantage gained thereby is the rapidity in which perfect work is turned out and labor and expense saved. The mechan-

ism entering into these various operations is mounted directly or indirectly upon a main frame 2, and the parts directly associated with the molding-flask A comprise a movable support B for the pattern C, a sliding sand-feed box D, and a tamping or ramming plunger E.

Flask A is of any usual or desired form and is removably supported upon a moldboard 3, bolted or otherwise fastened between the sides of frame 2. Pattern C is adapted to be raised and lowered through openings of corresponding shape to the pattern in moldboard 3, and the means for operating support B comprise a grooved cam 4, within which a roller *a* on the lower end of vertical stem 5 rides in constant engagement. A cross-bar 6 guides and supports the lower end of stem 5 in its vertical travel. Cam 4 is fastened on a cross-shaft 7, which has bearings on main frame 2, and said shaft is rotated by means of gears 8 at each end thereon outside of frame 2, which mesh with pinions 9 on a power-shaft 10, mounted in bearings at the rear of frame 2. A friction band-wheel 11 on shaft 10 transmits the power thereto when handle 12 throws in the friction-clutch-actuating mechanism. This friction-clutch mechanism may be of any suitable kind. As shown, a curved clutch-arm *d*, pivoted on wheel 11, is held at its free end in constant engagement with the beveled portion *e* on collar *f*. Rollers or pins *g* on the forked end of lever 12 ride in a circumferential groove in said collar and provide the connection whereby said collar is forced to slide on shaft 10 in relation to arm *d* when said lever 12 is actuated. Lever 12 is pivotally supported upon a standard 13, attached to frame 2 and is bent at an angle at 14. This angle 14 is engaged by a roller 15, mounted on the lower head 16 of the connecting-rods 17, which operate plunger E. Lever 12 is operated by hand to throw on the power and is engaged by roller 15 to throw off the power at the end of every single revolution of gear 8.

At the top and rear of the machine is located a sand-supply box or magazine 18, below which feed-box D is adapted to slide and rest to receive the sand, part of which is ultimately discharged into the flask A. Feed-

box D has side flanges 19, which slide in grooved ways *b* at the top of frame 2, and said box normally rests above a table 20 on frame 2, which is located beneath the supply-box 18. Box D is carried forward, with its load of sand, directly over flask A when plunger E is at the upper part of its movement and out of the way, and this is done by means of links 21, pivotally connected to trunnions or projections *c*, rigid with each side of box D, and levers 22, connected with said links, which levers are pivoted on the main frame at 23 and have rollers 24 below this pivot riding in cam-grooves 25 upon the inner face of each gear 8.

Connecting-rod heads 16 are attached to eccentrically-arranged wrist-pins 26 on the outer face of gears 8, and the connecting-rods 17 are rigidly attached to heads 16, but are free to slide at their top ends within heads 27, pivoted on the extensions or trunnions of cross-beam 28, which carries ramming-plunger E. Springs 29 are interposed between heads 27 and nuts 30, threaded on the top end of each rod 17. Cross-beam 28 is free to slide upon upright rods 31, rigidly attached to frame 2.

Feed-box D has a back extension or table 32, which closes the bottom of sand-supply box 18 when box D is carried forward. As box D is returned plunger E is being carried down, and the sand that has been deposited in flask A is then rammed in the flask, and it is in this connection that springs 29 are of all importance. If the sand were always of the same character, the exact pressure to make a perfect mold could be determined and plunger E could be set at any desired point; but the sand packs differently under different conditions, depending upon whether it be dry or green sand, and therefore a tamping-plunger having a yielding pressure, which will permit the plunger to adapt itself to varying conditions, is necessary. After plunger E is carried up the pattern C is withdrawn by cam 4 lowering support B, and the flask, with the finished mold, is then removed and a new flask is placed in position and the process is repeated.

Feed-box D is preferably made to hold considerably more sand than the flask requires, because a better and more even filling of the flask is thereby obtained.

The construction of the machine in its various details could be materially changed without departing from the spirit of my invention, and therefore I reserve the right to make such modifications as would come within the scope of my claims.

What I claim is—

1. In a molding-machine, a flask and pattern, and means to support the same, in combination with a movable sand-feed box having a greater sand capacity than said flask when the pattern is in place therein and when the sand is compressed, means to support said feed-box above and in close relation to said flask, and means to operate said feed-box

back and forth over said flask, substantially as described.

2. In a molding-machine, the flask and a support therefor, a ramming-plunger, a support for the pattern beneath said plunger, a sliding feed-box having a greater sand capacity than said flask when the sand is compressed, and means to carry said box over the pattern-support whereby part of its contents is discharged into said flask, and means to retire said feed-box to level the sand within the flask, substantially as described.

3. In a molding-machine, the flask and its support, a ramming-plunger arranged to operate above said support, means to raise and lower said plunger, a sand-feed box adapted to slide back and forth over said flask, said box comprising vertical walls with an open top and bottom, and constructed to carry more sand than said flask will hold when the pattern is in place therein and when the sand is compressed, a sand-supply box for said feed-box, and means to move said feed-box back and forth between said flask and supply-box, substantially as described.

4. In a molding-machine, the combination of a flask, a pattern-support beneath said flask, a ramming-plunger adapted to raise and lower in relation to said flask, vertical guides for said plunger, a power-gear, connecting-rods having crank connection with said gear and a sliding connection with said plunger, and springs mounted on said connecting-rods to provide a yielding pressure for the plunger, substantially as described.

5. A molding-machine provided with a flask and a support for said flask; a ramming-plunger having a cross-beam adapted to slide, rigid vertical guides for said beam, trunnions at either side of said beam, connecting-rod heads supported on said trunnions, power-gear, connecting-rods having crank connection with said gears and a sliding connection with said heads, adjustable nuts on the ends of said rods, and springs between said nuts and head to provide a yielding pressure for said plunger, substantially as described.

6. In a molding-machine, the movable ramming-plunger and a flask supported below the same, a pattern-support beneath said flask, a feed-box at one side constructed to hold more sand than said flask when the sand is compressed, and adapted to slide over the top face of the flask, a sand-supply box for said feed-box, means to slide said feed-box forward to convey part of the sand in said feed-box to said flask, means to slide said feed-box back to level the sand deposited in the flask, and means to operate said plunger to compress the sand fed into said flask, substantially as described.

7. A molding-machine comprising a sand-supply box, a flask, a feed-box having a larger sand capacity than said flask when the sand is compressed, and means to move said feed-box back and forth to fill the flask uniformly with sand and to level the sand therein, in

combination with a ramming-plunger having means to operate the same to compress the sand fed to said flask, substantially as described.

5 8. A molding-machine having a movable pattern-support and a ramming-plunger in line with said support, and means to operate both said support and plunger, comprising a shaft centrally located beneath both said
10 plunger and support, power-gears at each side of the vertical center of said plunger and movable support, connecting-rods for the plunger having crank connections with said gears, a cam on said shaft having operative
15 connection with said movable support, and means to rotate said shaft, substantially as described.

9. A molding-machine having a flask and a support therefor with a ramming-plunger arranged to operate above the same, a movable pattern-support arranged beneath said plunger, a cross-shaft beneath said pattern-support, a cam on said shaft to carry said support up and down and to hold the same in
25 raised position during the filling of the flask and compression of the sand therein, power-gears on said shaft, connecting-rods for said shaft having crank connections with said gears, and means to rotate said shaft, substantially as described.
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10. In a molding-machine having a frame constructed to support a flask and provided with a table at one side and level with the top face of said flask, a sand-supply box supported above said table, a movable feed-box
35 having an open top and bottom with vertical walls to form a chamber having a greater sand capacity than said flask when the sand is compressed, and provided with an extension at its top and rear adapted to close the

bottom of said supply-box when the said feed-box is shifted, means to shift said feed-box from said sand-box to the flask and back to partially discharge its load of sand into said flask, and means to level the sand in said flask
45 by the back movement of said feed-box, substantially as described.

11. In molding-machines using flasks and patterns, a sand-supply box, a movable sand-feed box beneath said supply-box, a ramming-plunger, a movable support for the pattern, a cross-shaft beneath said pattern-support, a pair of power-gears on said shaft, connecting-rods having crank connections with said gears to operate said plunger, cam-grooves in the
55 face of said gears, a pivoted lever mounted opposite each gear and having a roller riding in said grooves, links connecting said lever with the movable feed-box, means to rotate said gears and shaft, and means to automatically stop said mechanism at the end of the molding operation, substantially as described.
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12. In a molding-machine using flasks and patterns, a movable sand-feed box for filling the flask, a ramming-plunger, a movable support for the pattern, a cross-shaft having power-gears with connected mechanism to operate each of said parts, a friction-clutch, a lever to throw said clutch, and means eccentrically mounted on one gear to engage
65 said lever and stop the operation after each full revolution of said shaft, substantially as described.
70

Witness my hand to the foregoing specification this 9th day of August, 1901.

JOHN N. BATTENFELD.

Witnesses:

R. B. MOSER,
H. E. MUDRA.