

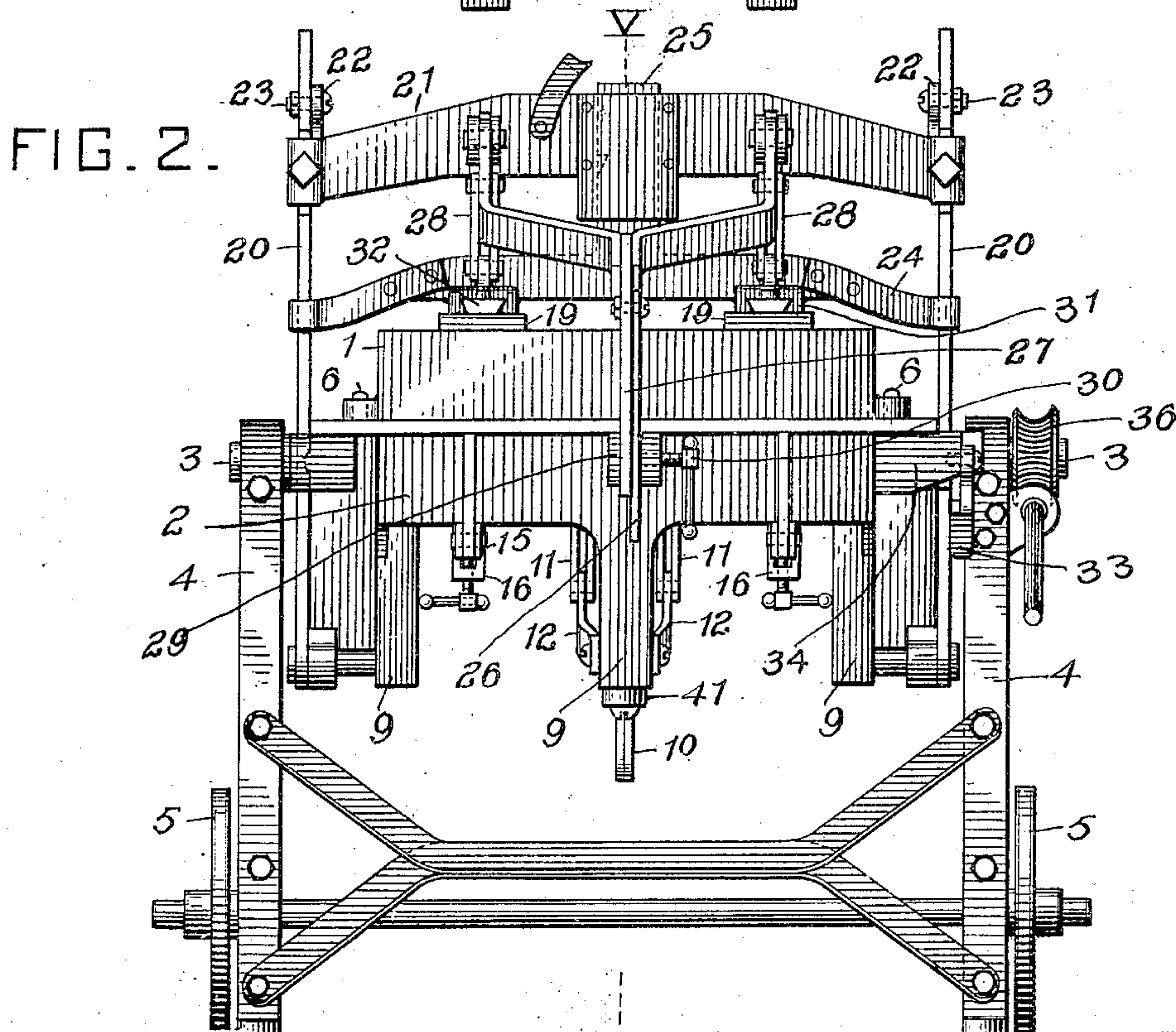
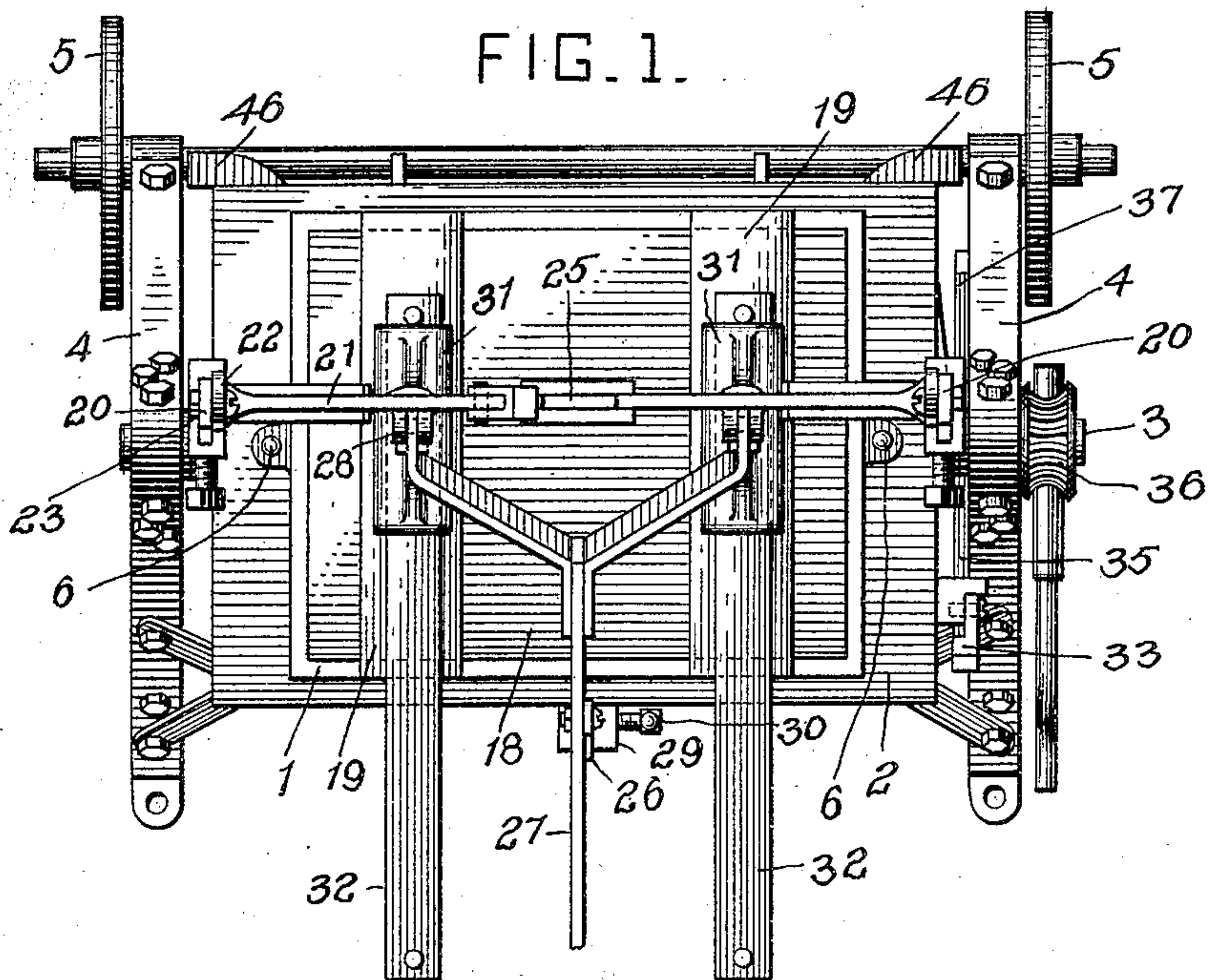
No. 879,950.

PATENTED FEB. 25, 1908.

M. J. DUNN.
MOLDING MACHINE.

APPLICATION FILED JAN. 5, 1907.

4 SHEETS—SHEET 1.



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4 SHEETS—SHEET 2.

FIG. 3.

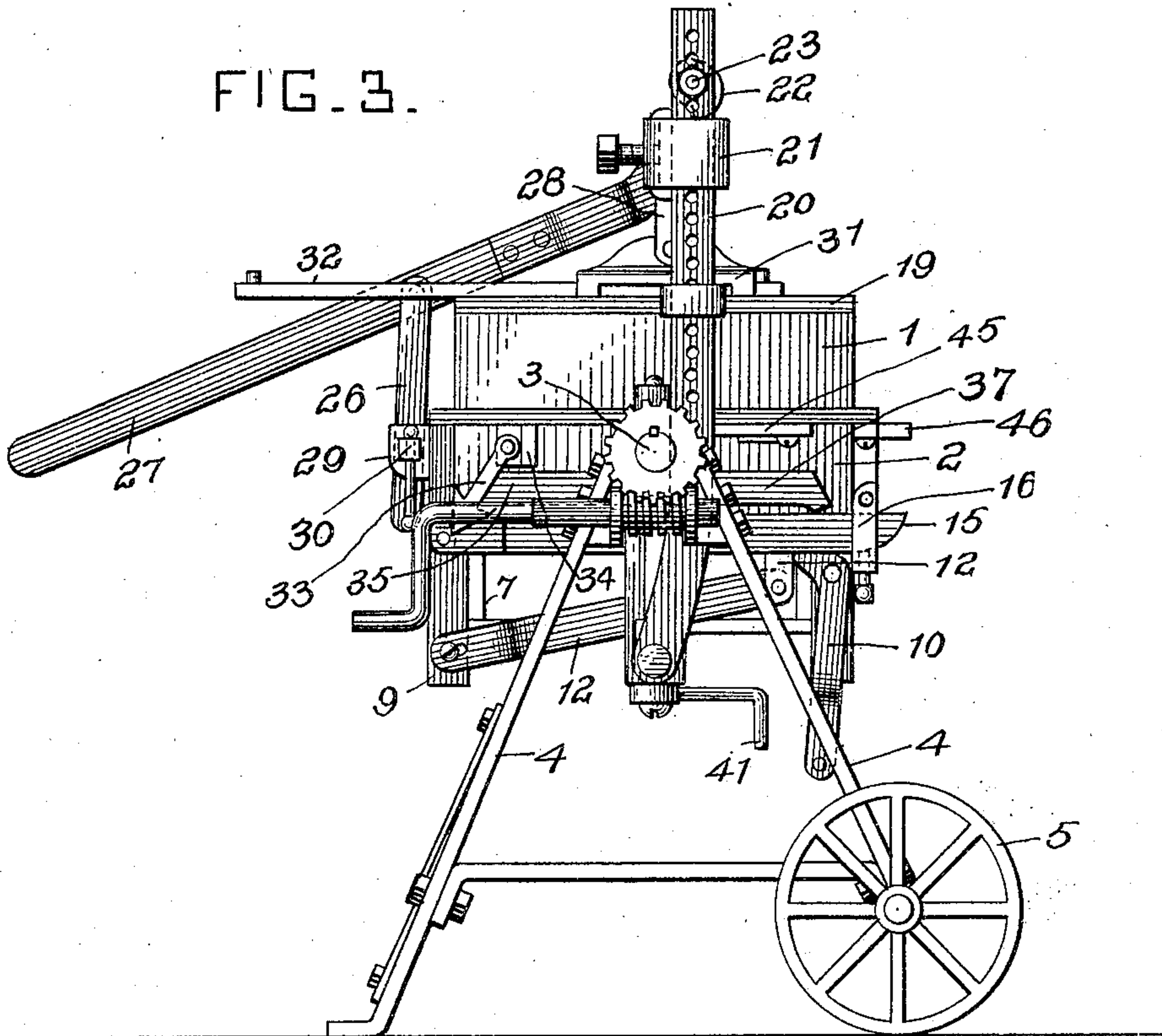
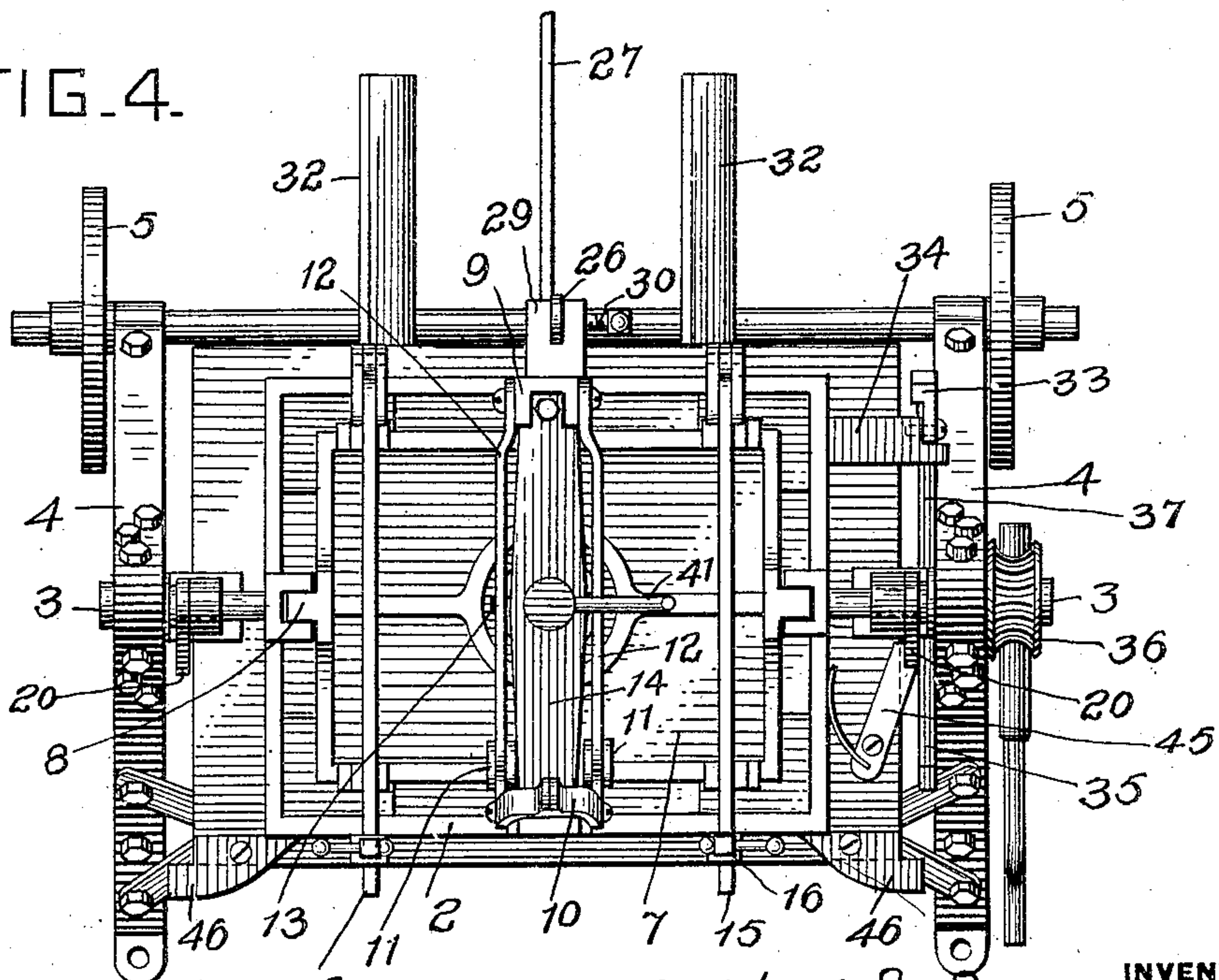


FIG. 4.



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4 SHEETS—SHEET 3.

FIG. 5.

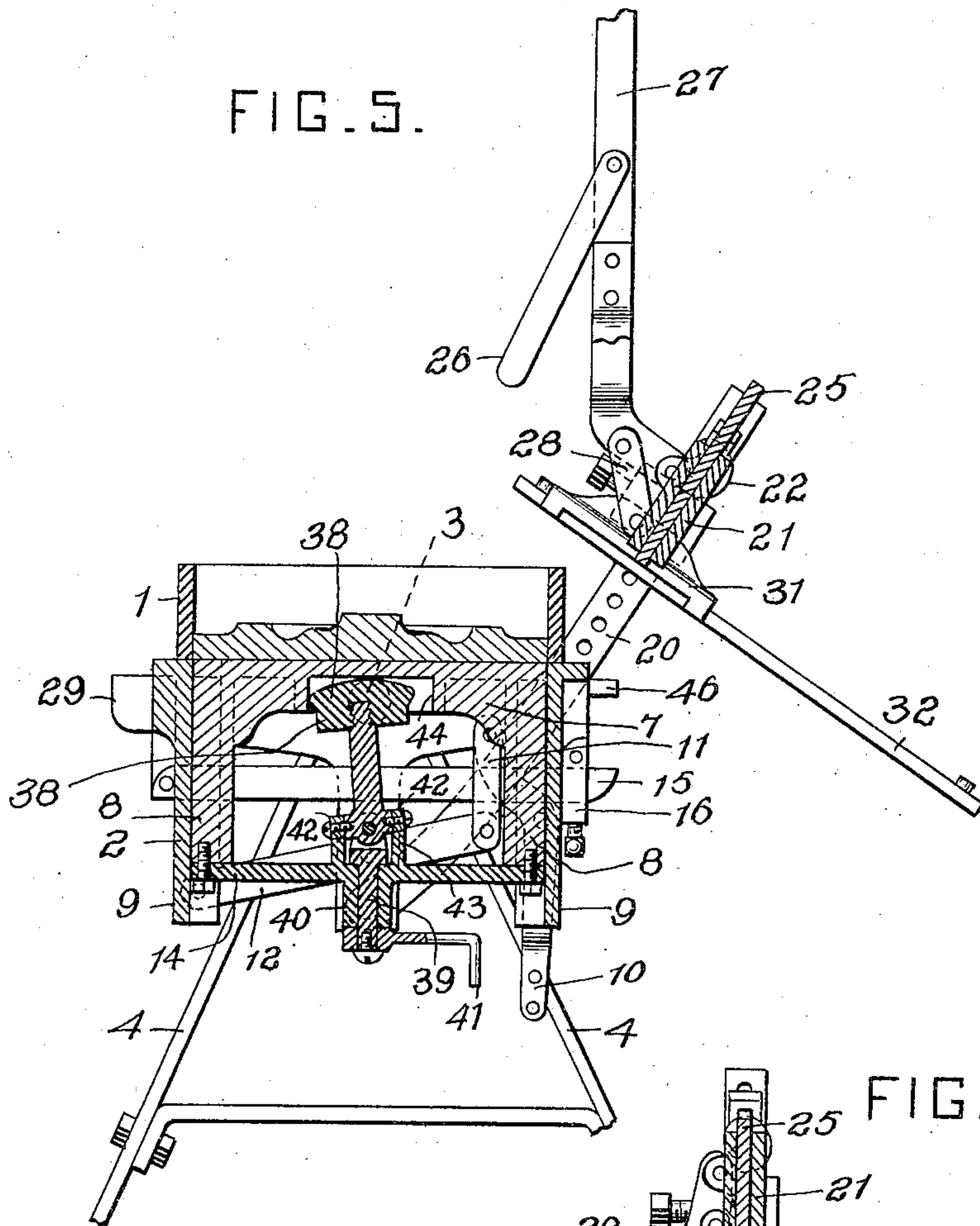
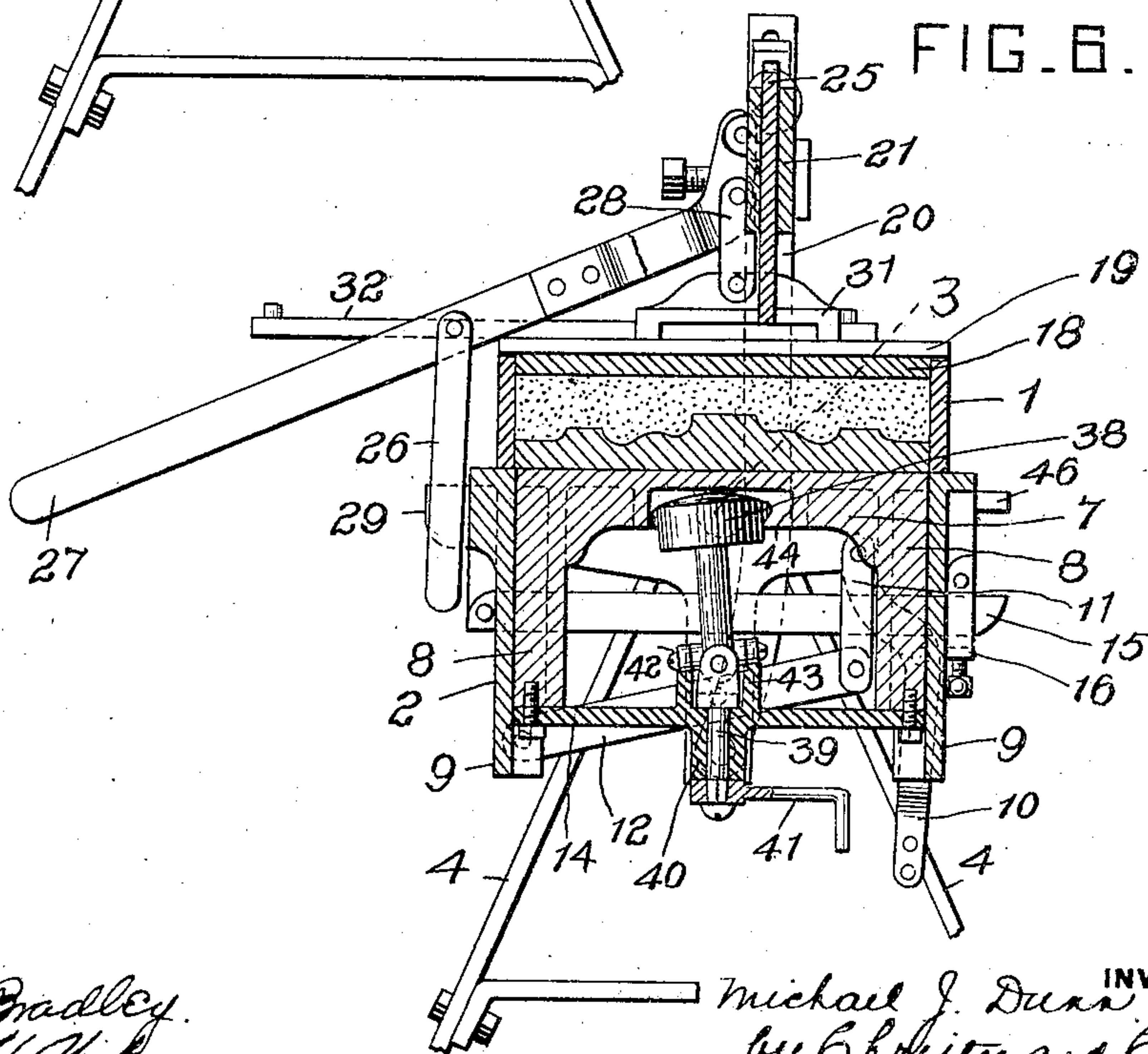


FIG. 6.



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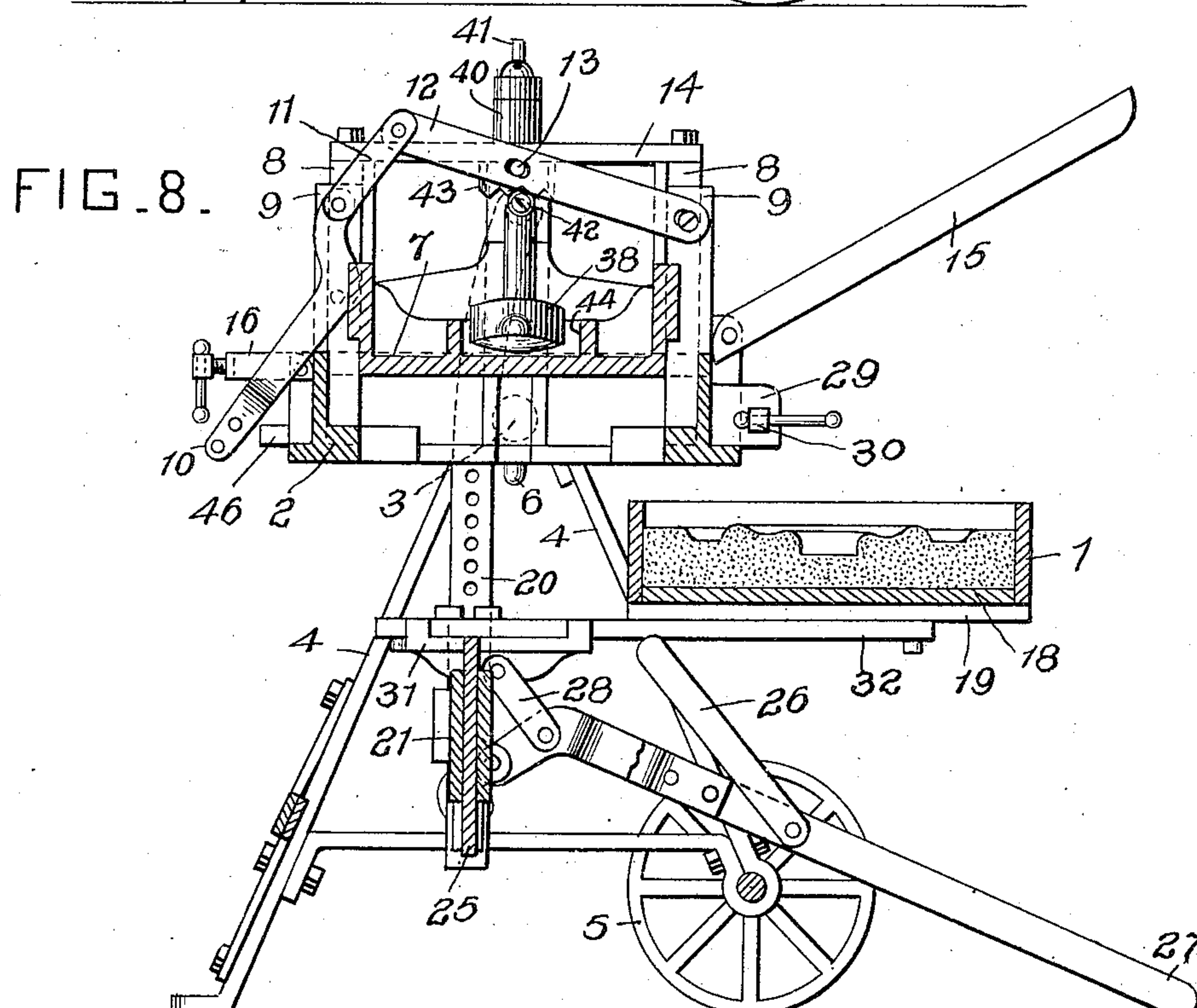
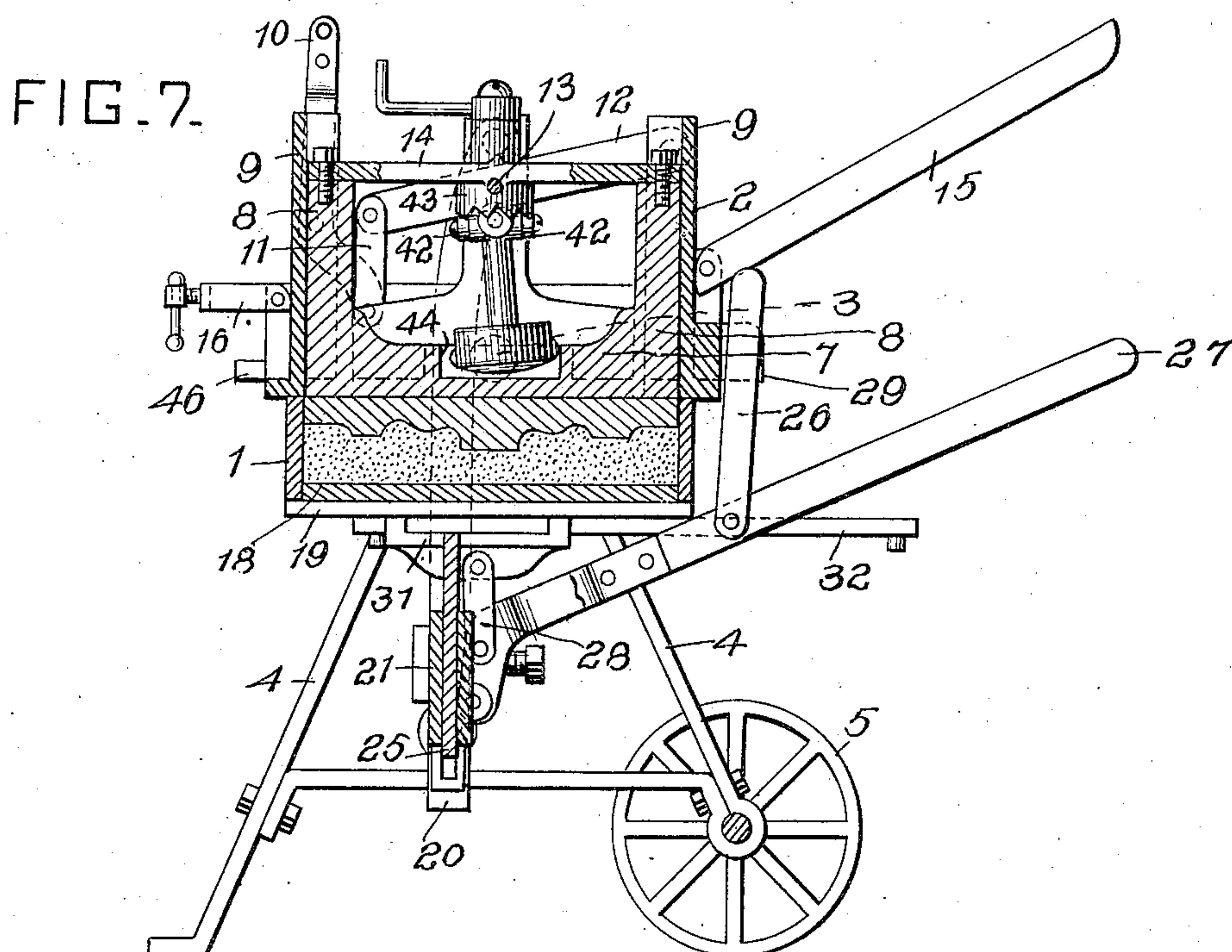
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4 SHEETS—SHEET 4.



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MOLDING-MACHINE.

No. 879,950.

Specification of Letters Patent.

Patented Feb. 25, 1908.

Application filed January 5, 1907. Serial No. 350,962.

To all whom it may concern:

Be it known that I, MICHAEL J. DUNN, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, a citizen of the United States, have invented or discovered certain new and useful Improvements in Molding-Machines, of which improvements the following is a specification.

The invention described herein relates to certain improvements in machines for making sand molds, and has for its object a construction in which provision is made for compacting the sand around a suitably supported pattern, reversing the mold, compressing means, pattern and its support, jarring the pattern and simultaneously withdrawing it from the mold.

The invention is hereinafter more fully described and claimed.

In the accompanying drawings forming a part of this specification Figure 1 is a top plan view of my machine, showing the position of the parts after the sand has been compressed; Fig. 2 is a front and Fig. 3 an end elevation of the same; Fig. 4 is a top view showing the parts reversed to withdraw the pattern; Fig. 5 is a sectional elevation on a plane indicated by the line V—V Fig. 2, showing position of parts at the beginning of the molding operation; Fig. 6 is a similar view showing parts after compression has been effected; Figs. 7 and 8 are sectional views showing the position of parts when the pattern is withdrawn and completed mold lowered onto supporting arms.

In the practice of my invention the section of the mold 1, *i. e.*, either the cope or drag is placed upon a frame 2, which is provided with suitable trunnions 3 mounted in bearings on the supporting frame 4. This frame 4 is preferably provided on two of its legs with wheels 5, so that by slightly tipping the frame on the axle of the wheels, the former can be shifted from place to place as desired. The frame 2 is provided with suitable means as the pins 6, whereby the section of the mold may be placed in proper position thereon and held from movement. Within the frame 2 is arranged a pattern board or head 7 preferably provided with guiding lugs 8 engaging grooves in the side walls of the frame 2. These grooves are extended as shown in Figs. 5 and 6 along posts 9 projecting from the frame 2 and the guiding lugs on the head or pattern board 7 are also extend-

ed, thereby insuring a steady movement of the pattern board 7. In order to shift this pattern board within the frame a bent lever 10 is pivotally mounted on one of the posts 9 and is connected by links 11 to one end of a lever 12 pivoted at its opposite end to a post 9 and pivotally connected midway of its ends by a pin 13 to a cross head 14 secured to lugs 8 on the pattern board. By moving this lever 10 outwardly the lever 12, and with it the cross head and pattern board, will be drawn into the frame thereby withdrawing a pattern from the sand.

When the levers 10 and 12 are in the position shown in Figs. 5, 6 and 7, the pattern board will be held from movement in one direction, *i. e.* from a downward movement when the parts of the molding machine are in the position shown in Figs. 5 and 6. It is preferred to employ additional means for holding the pattern from movement into the frame 2 such means consisting of arms 15 pivotally connected to the frame 2 on one side and detachably secured to the frame on the opposite side by means of loops 16, which can be swung over the ends of the arms and are provided with screws whereby the arms can be locked in position.

After a mold section has been placed in position and filled with sand, the latter being heaped slightly above the upper edges of the frame, a pressing board 18 is placed on the heaped up sand. A pressing mechanism which is pivotally mounted on two of the posts 9 of the frame 2, is next swung into position and a pressure is applied thereby to the board 18 forcing it down and compacting the same in the mold section around the pattern.

It is preferred that the pressing board should be provided with lateral extensions or cross pieces 19, which will prevent the board from being forced too far into the mold section.

The pressing mechanism consists of two arms 20, which as stated are pivotally connected at their lower ends to posts 9 on the frame 2. These arms are connected above the pivotal point by means of a cross head 21, which is provided at its ends with eyes for the reception of the arms 20. The adjustment of the cross-head can be effected in many ways. A convenient means to that end consists in forming a series of holes in the arms and employing cam plates 22 mounted

on pins 23 which can be shifted from hole to hole along the arms. These cam plates afford a convenient means for an accurate adjustment of the position of the cross head 21 on the arms. A sliding head 24 is provided at its ends with eyes surrounding the arms 20 which serve as guides for the movement of this head. An additional guide is provided in the form of the plate 25 extending up through a slot in the head 21. In order to shift the head 24 up and down, a lever 27, having its ends divided, forming two branches, is pivotally connected to the cross head 21, and also by links 28 to the movable head 24. As shown in Figs. 5 and 6 the arms of the lever 27 are bent and the movable head is connected to the lever adjacent to the angle of the latter. By reference to Fig. 6 it will be seen that the pivotal point of the lever and the pivotal connection of the link to the lever and to the movable head, will when the lever and head are down, be practically in the same plane, thereby forming a lock to hold the presser head 24 down against the pressing board as shown in Fig. 6. When the lever 27 is raised to lift the head, its first movement will be to move the pivotal point where the link is connected to the lever, outward, thus breaking the lock which holds the head in depressed position. In order to prevent the lever and the parts operated thereby from movement when the frame 2 is turned over, as hereinafter described I provide a lock for the lever, consisting of a metal strip 26 pivotally connected to the lever, and adapted to be swung down into a slot between lugs 29 on the frame 2, where it is held by means of a screw 30 or other suitable means.

In order to give the movable head 24 a comparatively broad bearing upon the presser head, said head is provided with lateral extensions 31, as shown in Figs. 5 and 6. In order to facilitate the removal of the completed mold from off the head and its extensions 31, when the latter is in inverted position, as hereinafter described, I provide movable bars 32 which are mounted in the portions 31 of the head and adapted to be slid back and forth as required. When it is desired to remove a completed mold these bars are pushed to one side as shown in Fig. 8 and the completed mold slid along the same from under the frame 2, as will be hereinafter more fully stated.

After the sand has been compressed and the movable head 24 locked down as described, a double pawl 33, pivotally connected to a lateral extension 34 on the frame 2 is shifted to clear an arm 35 on the supporting frame 4; the frame 2 and the several parts carried thereby can now be turned by hand, but are preferably turned by means of a worm and gear 36, the gear being mounted on one of the trunnions 3 and the worm on

the frame 4. This power device for turning the frame 2 is especially useful in connection with the making of heavy molds. By the rotation of the frame 2 on its trunnions, the pressing mechanism and the completed mold are brought lowermost as shown in Figs. 7 and 8, and the parts are locked in this position by the pawl 33 engaging an arm 37 on the opposite side of the machine. The arms 15 are now released, turned backward as shown in Figs. 7 and 8, thus freeing the pattern board or head 7 and permitting of its movement along the frame as hereinafter described. Before this pattern board is shifted to withdraw the pattern from the mold, it is necessary to free the pattern from the adhering sand and to this end suitable means are employed for rapping or hammering on the pattern board, so as to impart the jarring motion usually employed for that purpose. A desirable construction to this end consists of a hammer 38 pivotally mounted on a stem 39 passing through a sleeve 40 on the head 14. At its outer end, this stem is provided with an operating handle 41. The stem of the hammer is provided with extensions 42 at right angles to the pivotal axis thereof, said extensions having rollers on their ends adapted to engage a toothed crown 43 on the under-side of the head 14. The pivotal axis of the hammer and the lateral extensions are so constructed and arranged with reference to this toothed crown that one of the extensions must enter a notch between adjacent teeth before the opposite extension can pass below the diametrically opposite tooth. By reason of this construction the hammer when being rotated will be swung laterally for every tooth in the crown, and in its movement will strike against circular wall 44 formed on the under-side of the pattern board. Thus imparting a series of shocks sufficient to loosen the pattern in the mold but not to injure the latter. After the pattern has been loosened the lever is shifted to lift the pattern board away from the mold, the hammer being operated so as to continue the jar during this lifting movement. As will be seen by reference to Fig. 8 the levers 10—12 and their connecting link are all so constructed and arranged that when the pattern has been withdrawn from the mold, the parts will be in such position as to lock the pattern board in its raised position. After the mold has been withdrawn, the lever 27 is released allowing a downward movement of the movable head 24, so as to lower the completed mold away from the frame 2, as shown in Fig. 8. The bars or rails 32 are then shifted to the position shown, and the completed mold slid along the same until it can be easily removed from the machine. In order to lock the pressing mechanism in operative position relative to the mold as shown in Figs. 3 and 4 a

spring dog 45 is pivotally connected to the frame 2 in such position as to engage the arms of the pressing mechanism, when raised to operative position as shown. The pressing mechanism is retained in position shown in Fig. 5 by means of lugs or ears 46 on the frame 2.

I claim herein as my invention:

1. In a molding machine, the combination of a reversible frame, a head or pattern board movably mounted in said frame, and a sand compressing mechanism mounted on the frame and movable transversely of the pattern board to and from operative position and reversible with the frame.

2. In a molding machine the combination of a reversible frame, a head or pattern board movably mounted in said frame, means for locking said head in operative position, compressing mechanism pivotally mounted on the frame and reversible therewith and means for locking the compressing mechanism in operative position.

3. In a molding machine the combination of a reversible frame, a head or pattern board movably mounted in said frame, arms mounted on the frame, a pressing mechanism movable along said arms, a lever for shifting said head and means for locking the lever to the frame and thereby holding the completed mold in position on the frame.

4. In a folding machine, the combination of a reversible frame, a head or pattern board movably mounted in the frame and adapted to move laterally into and out of line with the pattern board, arms mounted on the frame, a cross-head adjustably mounted on the arms, a pressing head, a lever pivotally mounted on the cross-head and connected to the presser-head and means for locking the lever to the frame and thereby holding the completed mold in position on the frame.

5. In a molding machine, the combination of a reversible frame, a compressing mechanism carried by the frame, means for locking the compressing mechanism in position to hold a mold section on the frame, a head or pattern board movably mounted in the

frame, and means for withdrawing the head or pattern board into the frame.

6. In a molding machine, the combination of a reversible frame, means for locking a mold section to the frame, a head or pattern board movably mounted in the frame, a lever connected to the head or pattern board, and means for locking said lever to the frame and thereby locking the head or pattern board in operative position.

7. In a molding machine, the combination of a reversible frame, means for locking a mold section to the frame, a head or pattern board movably mounted in the frame, a hammer pivotally mounted on the head and means for swinging the hammer in different radial directions to jar the head and pattern carried thereby.

8. In a molding machine, the combination of a frame, means for locking a mold section to the frame, a head or pattern board movably mounted in the frame, a toothed crown carried by the head, a rotatable shaft passing through the crown, a hammer having its stem pivotally connected to the shaft and arms arranged on the stem at right angles to its pivotal axis and adapted to engage the teeth on the crown.

9. In a molding machine, the combination of a reversible frame, a head or pattern board movably mounted in the frame, compressing mechanism carried by the frame and reversible therewith, and mold supporting rails movably mounted on the compressing mechanism.

10. In a molding machine, the combination of a frame having posts from and parallel with the sides thereof, and a head or pattern board being provided with complementary grinding element on the frame extending along the posts.

In testimony whereof, I have hereunto set my hand.

MICHAEL J. DUNN.

Witnesses:

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J. HERBERT BRADLEY.