

924,366.

R. C. MEYERS.
MOLDING MACHINE.
APPLICATION FILED SEPT. 14, 1908.

Patented June 8, 1909.

3 SHEETS—SHEET 1.

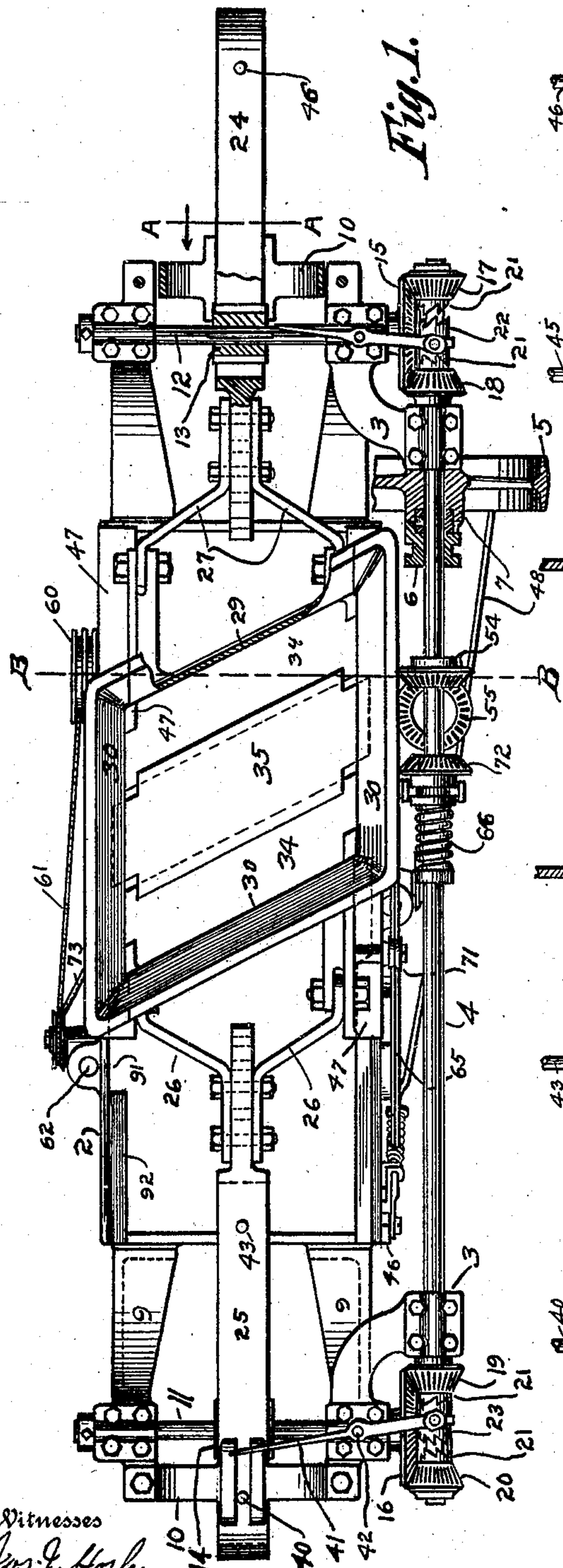
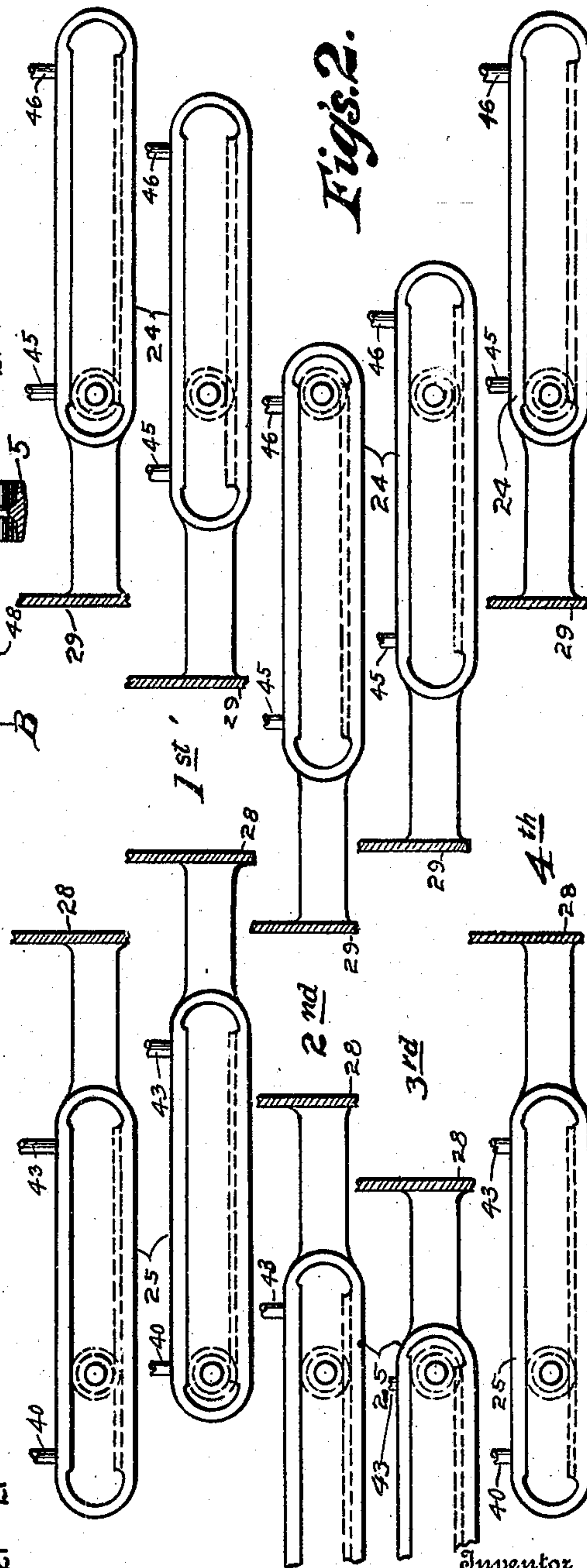


Fig. 1.



Figs. 2.

Witnesses
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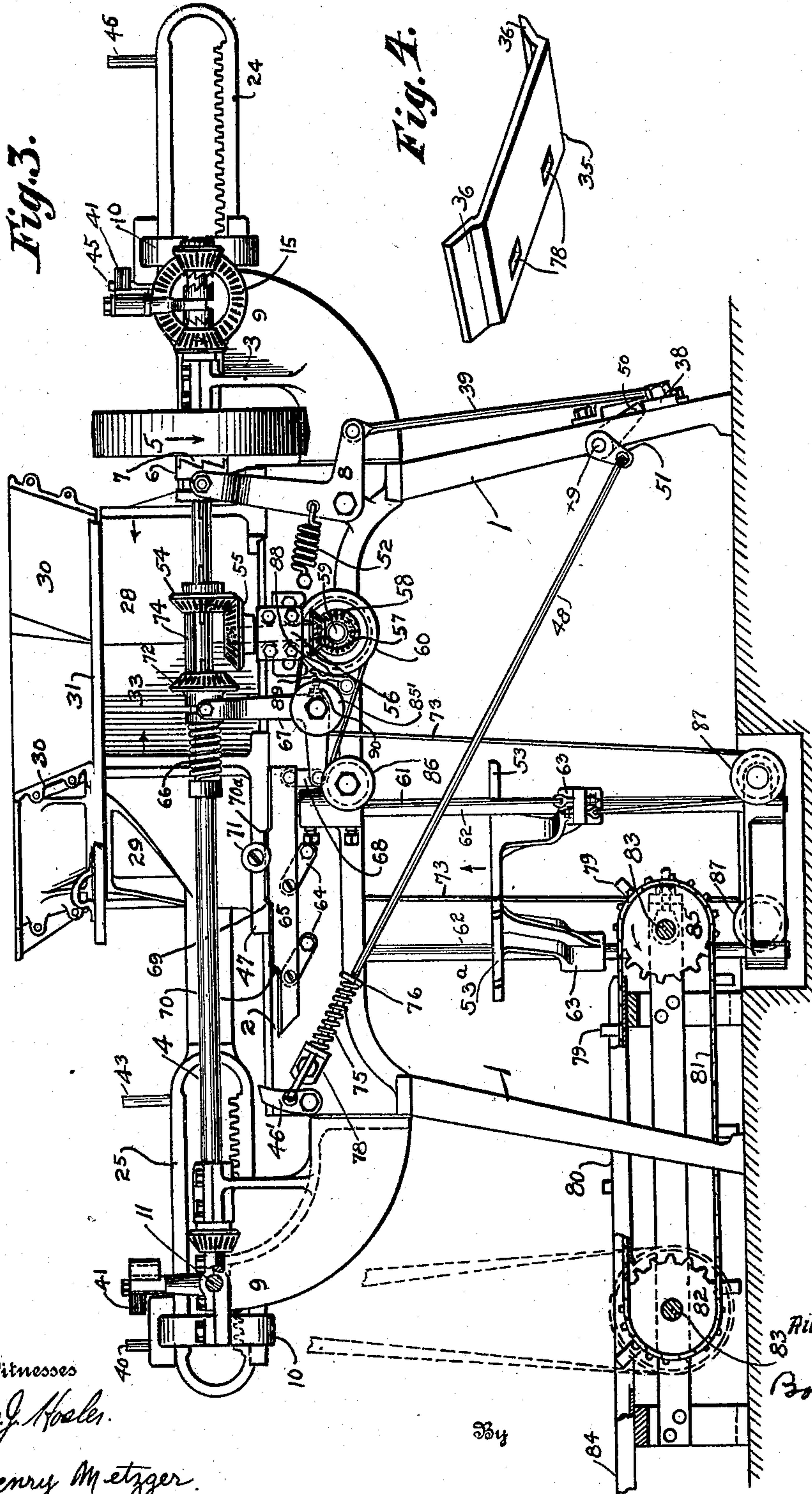
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8 SHEETS—SHEET 2.

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3 SHEETS—SHEET 3

Fig. 7.

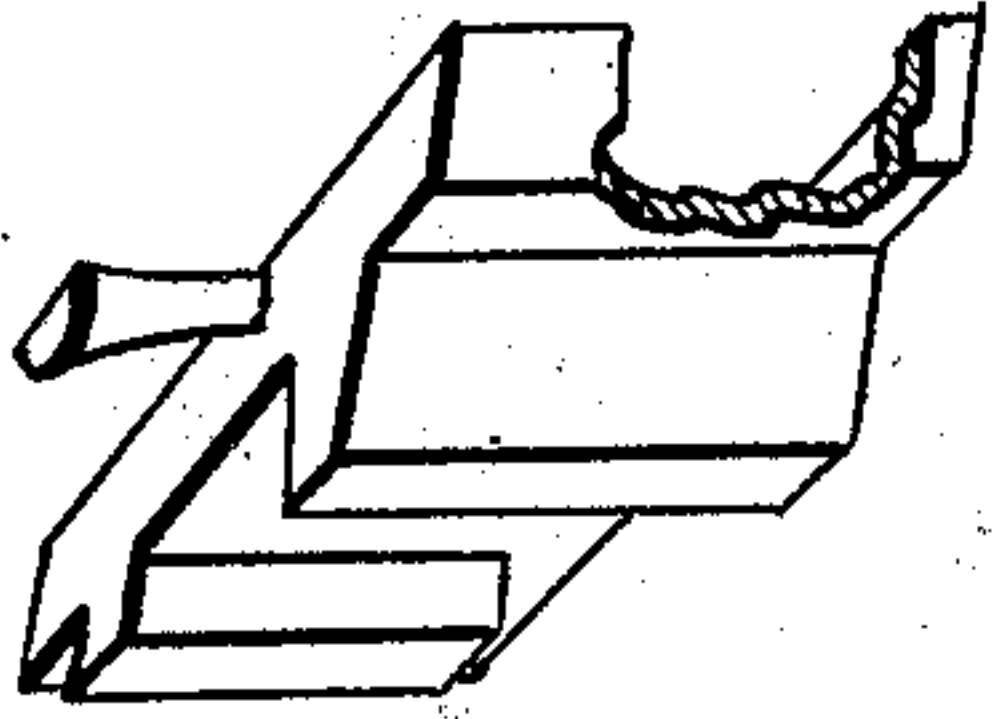


Fig. 8.

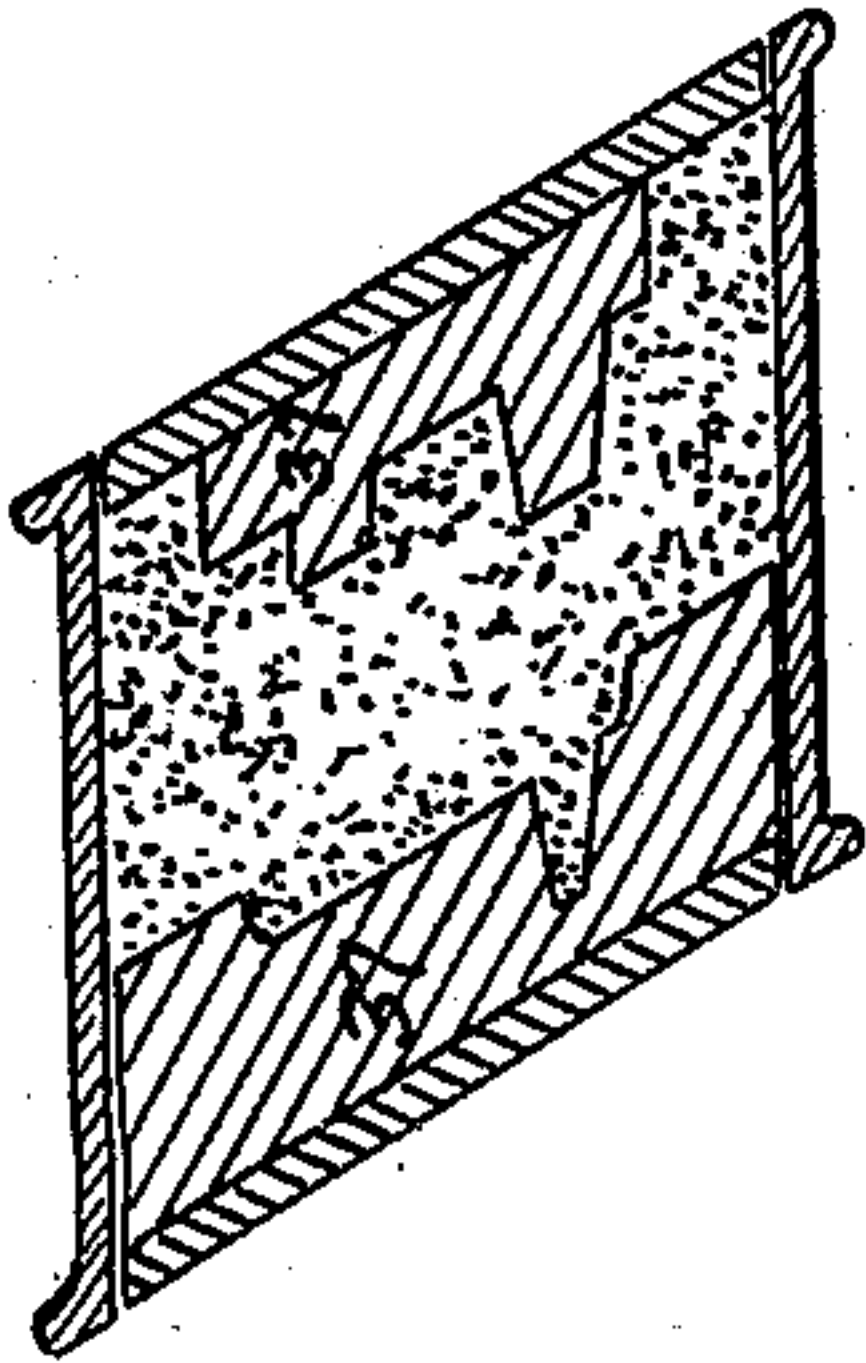


Fig. 9.

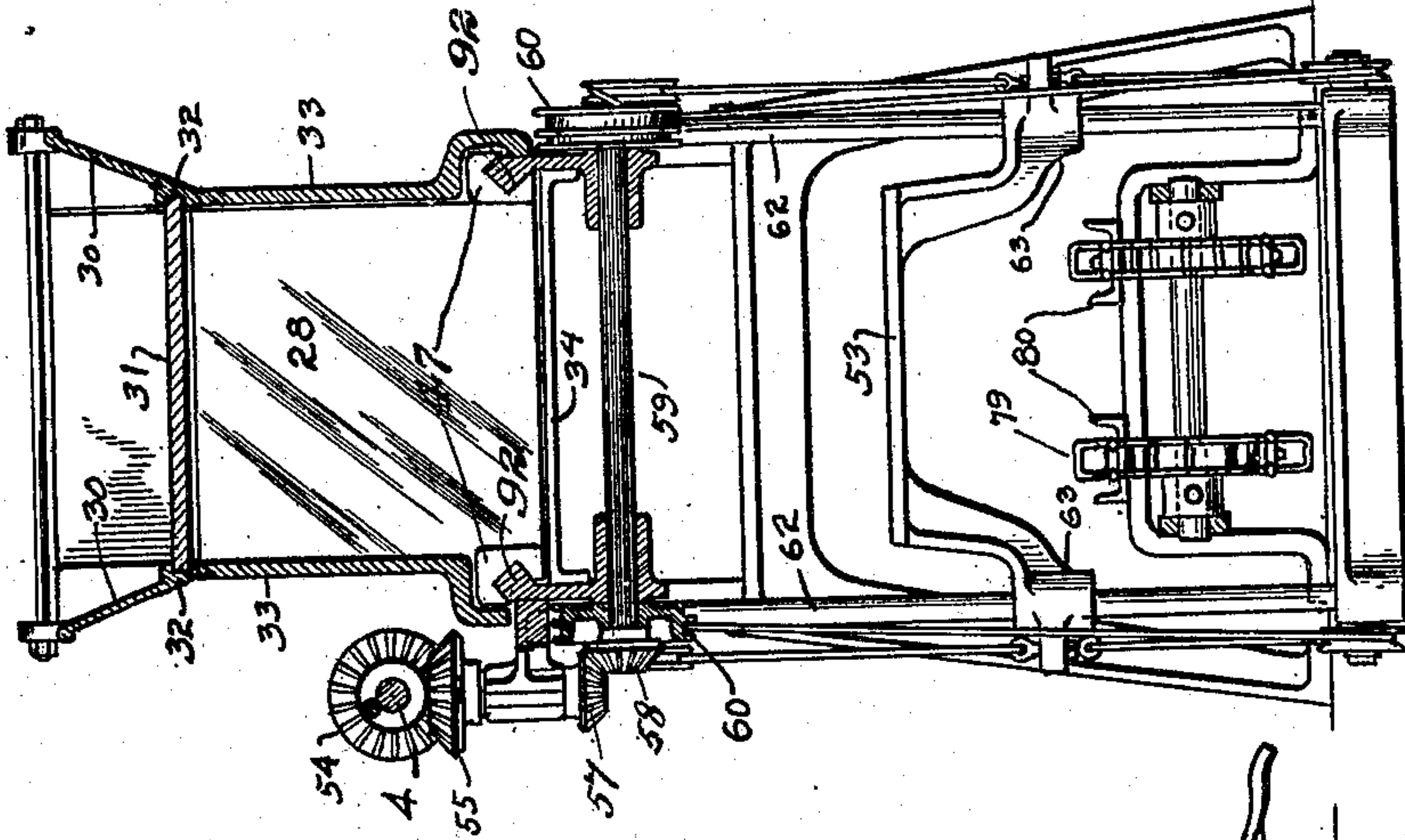
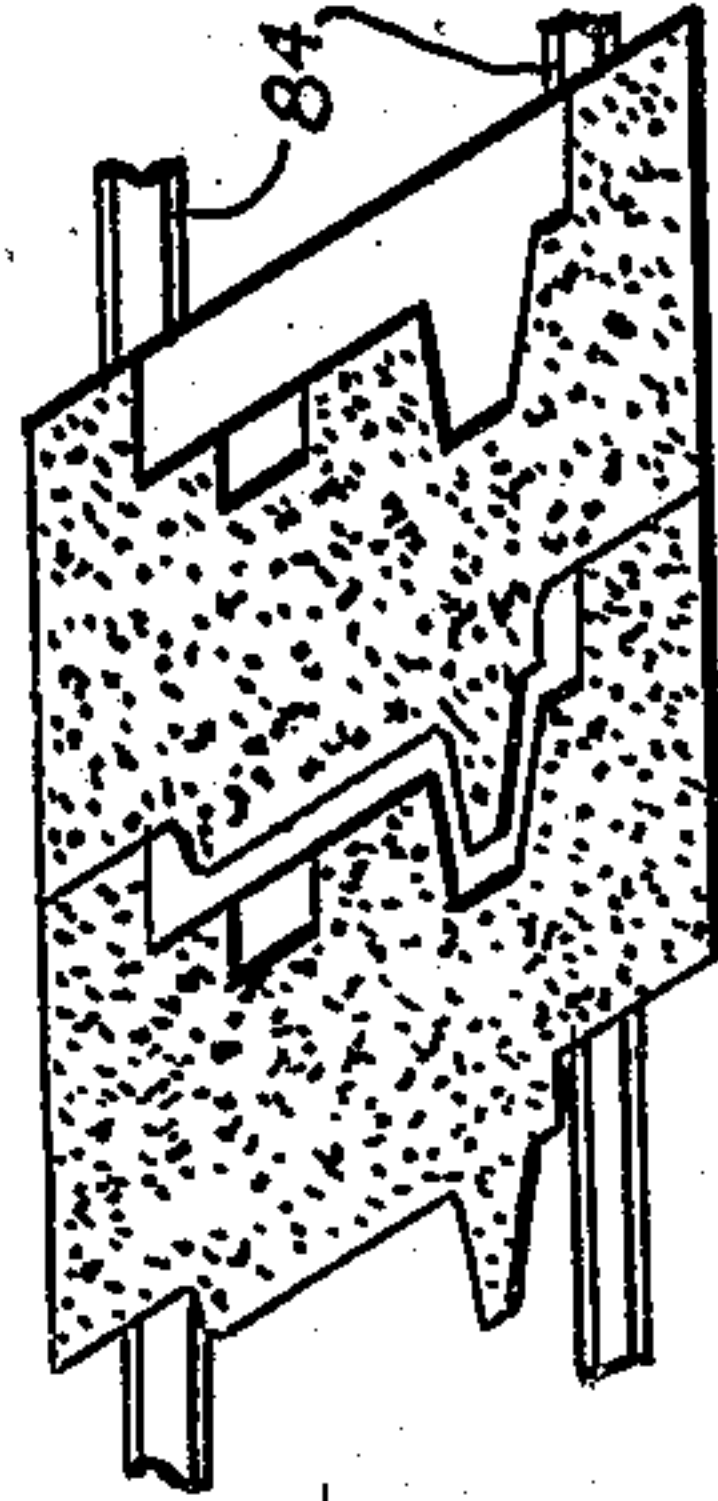


Fig. 6.

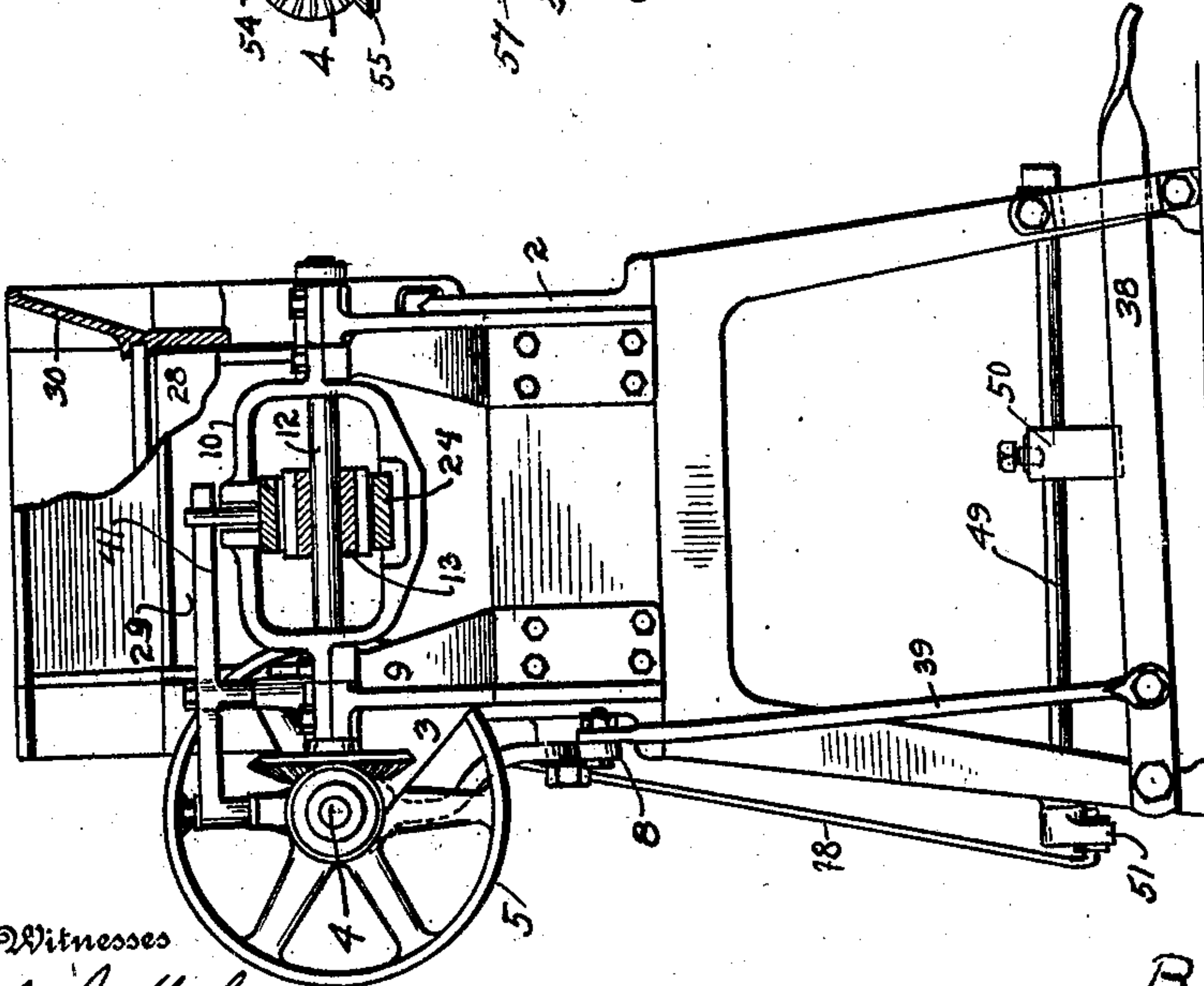


Fig. 5.

Witnesses

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UNITED STATES PATENT OFFICE.

RICHARD C. MEYERS, OF CANTON, OHIO.

MOLDING-MACHINE.

No. 924,366.

Specification of Letters Patent.

Patented June 8, 1909.

Application filed September 14, 1908. Serial No. 453,033.

To all whom it may concern:

Be it known that I, RICHARD C. MEYERS, a citizen of the United States, residing at Canton, in the county of Stark and State of Ohio, have invented certain new and useful Improvements in Molding-Machines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, and to the numerals of reference marked thereon, in which—

Figure 1 is a top view. Fig. 2 are detached views of the combined sand compressors and mold impressing bars, showing the same in their different relative positions at times of rest. Fig. 3 is a side elevation showing parts broken away. Fig. 4 is a detached view of one of the mold boards or bottoms. Fig. 5 is an end view looking to the left from line A—A, Fig. 1. Fig. 6 is a sectional view on line B—B, Fig. 1. Fig. 7 is a detached view of a casting. Fig. 8 is a view showing the positions of the patterns and compressing heads when the compressing heads have been brought to their nearest approach to each other. Fig. 9 is a view showing two sand blocks with the pattern imprints intended and the blocks in position with reference to each other to produce a mold.

The present invention has relation to molding machines designed to produce molds for castings by first, compressing a body of sand properly prepared; second, to impress or indent the form of the pattern in the faces of the block of sand after it has been compressed; third, moving the block of sand in a horizontal plane; fifth releasing the block and allowing the same with the pattern imprints thereon to be automatically removed, which objects are carried out as hereinafter described and the invention more particularly pointed out in the claims.

Similar numerals of reference indicate corresponding parts in all the figures of the drawing.

In the accompanying drawings, 1 represents the frame of the machine which is formed of sufficient strength to properly support the various parts and to provide means for connecting the various parts of the machine in such a manner that they will

be held in proper relationship with reference to each other. To the base or support 1, are attached in any convenient and well known manner the housings or side members 2, said side members being tied together so as to hold the same in proper parallel relationship in any convenient manner. In the brackets 3 is properly journaled the power shaft 4, which power shaft is provided with the power wheel 5 said power wheel being loosely mounted upon the shaft 4 and is driven from any source of power. Upon this power shaft 4 is slidably mounted the clutch member 6, which clutch member is rotatably mounted upon the power shaft 4 and when it is desired to impart rotary motion to the power shaft the clutch 6 is brought into engagement with the clutch member 7, which clutch member is preferably formed integral with the power wheel 5, or in other words the clutch portion is formed on the end of the hub of the power wheel 5, said slidable clutch member being moved back and forth upon the power shaft 4 so as to engage and disengage the same by means of the L shaped lever 8, as hereinafter described.

At the ends of the housings 2 are connected in any convenient and well known manner the brackets or arms 9, which brackets are tied together at their outer ends by the yokes 10, which yokes are also for the purpose hereinafter described. In the brackets 9 are journaled the transverse shafts 11 and 12, which transverse shafts are each provided with the fixedly mounted pinions 13 and 14. Upon the shafts 11 and 12 are securely mounted the beveled gear wheels 15 and 16, which beveled gear wheels 15 and 16 mesh with the beveled gear wheels 17, 18, 19 and 20, said beveled gear wheels being loosely mounted upon the power shaft 4. Each of the beveled gears 17, 18, 19 and 20 are provided with the integral or fixed clutch members 21, between which clutch members 21 are located the double faced clutch members 22 and 23, each of said clutch members being adapted for engagement with the various clutch members 21 and in such a manner that opposite rotation is imparted to the beveled gear wheels 15 and 16 and the shafts 11 and 12, by means of the beveled gear wheels 17 and 18 and the beveled gear wheels 19 and 20 being alter-

nately brought into positive action by means of the sliding clutches 22 and 23 as hereinafter described.

Upon the yokes 10 are slidably mounted the toothed bars 24 and 25, which toothed bars mesh with the pinions 13 and 14 so that when rotary motion is imparted to the pinions 13 and 14 a reciprocating, or endwise movement will be imparted to the toothed bars and the direction of end movement being governed by the direction of rotary movement of the pinions 13 and 14, and when the direction of motion of the pinion is changed, or reversed the direction of the end movement of the toothed bars will be reversed.

To the inner ends of the toothed bars 24 and 25 are attached the diverging bars 26 and 27 and to these bars are connected the sand compressing heads or followers 28 and 29, which are located below the sand hopper 30 and also below the sliding sand cut-off plate 31, which sand cut-off plate is held in the guide ways 32 formed in the top or upper ends or edges of the sides 33. For the purpose of holding the sand while the same is being compressed and in a loose condition the bottom plates 34 are provided which are bolted or otherwise attached to the housings 2, or their equivalents. Between the spaced plates 34 is located the molding board or bottom 35, which is substantially of the form shown in Fig. 4 and rests upon the flanges 36. The first operation in producing the mold for a casting is to place a quantity of sand upon the bottom plates 34 and the mold-board or bottom 35, by withdrawing the cut-off plate 31, thereby permitting the sand to come between the compressors 28 and 29 and between the sides 33, after which the compressors 28 and 29 are moved toward each other as hereinafter described, which movement compresses the sand and forms in the faces of the compressed sand, which is formed into a block, the imprint of the patterns 37 which patterns are temporarily attached to the compressors or followers 28 and 29. The finished impression of the patterns being illustrated in Fig. 9 and the patterns shown embedded or seated in the faces of the sand shown in Fig. 8. Compression is effected by bringing the compressors or followers toward each other, by bringing the machine into action, which is done by a downward movement of the foot lever 38 which downward movement brings the clutch 6 into engagement with the clutch member 7 upon the power wheel 5 by means of the L shaped lever 8 and the connecting link 39.

It will be understood that as the sand is being compressed the rack bar 25 will move to the right and the rack bar 24 to the left, and after the proper compression has been made and the patterns properly embedded,

the pin 40 comes in contact with the pivoted lever 41 and rocks said lever upon its pivotal point 42, which in turn shifts the double faced clutch 23 thereby changing the direction of rotation of the beveled gear wheel 16 and the shaft 11, thereby reversing the motion of the toothed bar 25. The bar 24 moves in the same direction or in other words to the left until the pin 43 shifts the lever 41 and the clutch 22 thereby reversing the motion of the bar 24, which separates the compressors or followers 28 and 29. The reverse motion is brought about by means of the pins 45 and 46. In other words there are four distinct movements of the bars 24 and 25, first, toward each other, second, both to the left, third, from each other and fourth, both to the right, which movements are clearly illustrated in Fig. 2, and marked respectively between the followers, 1st, 2nd, 3rd and 4th.

It will be understood that the compressors or followers should come to a stop or in other words the machine stop when the followers or compressors are brought into the position marked 3rd, in Fig. 2, so that the compressed block of sand or mold is at rest as is also the machine, and in order to provide for this stop at this time the trip or dog 46 is provided, which dog is pivotally attached to a fixed part of the frame and is located in the path of the follower bar 47 and when the end of said follower bar strikes the trip or dog it will be rocked to the left, which in turn pulls the connecting rod 48 and rocks the shaft 49 which shaft is provided with the block or head 50, said block or head being adapted to hold the foot-lever 38 down, but when the shaft 29 is rocked by means of the rod 48, and the crank arm 51, the L shaped lever 8 is automatically actuated by the spring 52, thereby disengaging the clutch 6 and throwing the machine out of action.

For the purpose of providing a support for the blocks of sand or molds after they have been released, a platform or table 53 must be provided and this table must be elevated directly beneath the open space when the compressors are in the 3rd position, shown in Fig. 2, and in order to provide for this, means must be provided for elevating the table or support during the time the sand is compressed and the mold formed and moved. In order to elevate the table 53, and bring it into position to receive the molds the power shaft 4 is provided with the bevel gear wheel 54, which beveled gear wheel meshes with the beveled gear wheel 55, which beveled gear wheel is secured to the short shaft 56 and the short shaft 56 provided with the beveled gear wheel 57 which beveled gear wheel 57 meshes with the beveled gear wheel 58, said beveled gear wheel being securely connected to the

shaft 59, and upon said shaft 59 are located and fixed spools or drums 60, from which drums the cords 61 extend and when said cords are wound upon the drums or spools the table will be elevated and held, said table being guided by the guide-rods 62 and the guide blocks 63.

To the frame of the machine proper are pivotally attached the links 64, to which links are pivotally attached to the stepped trip bar 65, which trip bar is normally held in elevation by means of the spring 66, and the L shaped lever 67 and the link 68, which link is connected to the bar 65. The bar 65 is provided with the three steps 69, 70 and 70^a. During the first part of the movement of the follower bar 47 to the right the roller 71 carried by said bar will pass the step 70^a and allow the spring 66 to force the beveled gear wheel 54 out of mesh with the beveled gear wheel 55, at which time there is no movement of the mechanism designed to elevate the table 53, but when the roller 71 upon its backward movement rides up the shoulder or stop 70^a and depresses the bar 65 the wheel 54 is again brought into engagement with the wheel 55 and when the roller 71 passes the step 69 the wheel 54 is thrown out of action or in mesh with the wheel 55 but when the roller 71 has passed the step 70 a further upward movement of the bar 65 is permitted and the gear wheel 72 brought into mesh with the gear wheel 55 and the motion of the drums 60 reversed, this being accomplished by the action of the spring 66 which frees the spring sufficiently to allow it to move the beveled gear wheels 72 into engagement with the beveled gear wheel 55. These various movements elevate and lower the table 53. It will be understood that the beveled gear wheels 54 and 72 must be slidably mounted upon the power shaft so that they will slide in unison and in order to provide for this the tie bar 74 is provided which tie bar is connected to the gear wheels 54 and 72 in any convenient and well known manner.

When the table 53 is brought into its lowest position the molding boards or bottoms 35 together with the mold or block of sand are provided with the recesses 78 which recesses are for the purpose of permitting the tangs 79 to engage the recesses 78 and move the bottom or molding board 35 together with its load off the table 33 and on to the channel bars 80, upon which they are moved along by the endless chains 81, said endless chains being driven by the sprocket wheels 82 which sprocket wheels are mounted upon the shaft 83 and the suitable power wheel secured to said shaft. Beyond the endless chain are extended suitable supporting bars 84, which bars support the bottom boards and the mold and if desired castings

can be made while the molds are on the bars or the molds can be removed to any desired place and the castings produced. It will be understood that idle sprocket wheels 85 should be provided. It will also be understood that the cords 61 and 73 should be guided around guide pulleys such as 85', 86 and 87. The location and arrangement of these pulleys is simply mechanical, and no description is deemed necessary.

It will be understood that when the limit of the movement to the left of the rack bar 25 is completed or rather the trip or dog 46 is moved some provision must be made for bringing it into position for the next tripping or stopping action, therefore the spring 75 is provided which spring is held between the flange 76 and the bracket 77.

For the purpose of frictionally holding the spool 60 against rotation when the wheels 54 and 74 are both out of mesh with the wheel 55 the spring plate 88 is provided, which spring plate is provided with the rib 89, which rib is for the purpose of engagement with the outer end of the pin 90 secured to the lever 67 or its equivalent. This pin is illustrated in dotted lines, owing to the fact that it is located back of the pulley 85.

It will be understood that provision must be made for removing the mold board 35 when it is brought to the point where it is to be lowered or placed upon the table 53 and in order to provide for this the notches or open spaces 91 must be formed in the flanges 92 this feature being best illustrated in Fig. 1.

In order that the outer ends of the tangs 79 can come above the top of the table 53 when in its lowermost position, said table is provided with the opening 53^a through which opening the tangs are free to pass as they pass over the sprocket wheel 85.

Having 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 suitable base, housings connected to and carried by said base, a power shaft having fixedly mounted thereon double faced clutches, beveled gear wheels mounted upon said shaft at its ends, transverse shafts having mounted thereon beveled gear wheels adapted to mesh with the loosely mounted beveled gear wheels, pinions secured to said transverse shaft, rack bars adapted to mesh with said pinions, compressors adapted to be actuated by the toothed bars and means for reversing the movement of the compressors, and spaced bottom plates held in fixed position and a molding board, substantially as and for the purpose specified.

2. In a molding machine of the class described, the combination of a suitable frame, a power shaft and a power wheel loosely

mounted thereon, a clutch slidably mounted upon the power shaft and rotatable therewith, transverse shafts provided with pinions, rack bars adapted to be actuated by the pinions, sand compressors adapted to be actuated by the rack bars, spaced bottom plates and a molding board and means for reversing the movement of the rack bars, substantially as and for the purpose specified.

3. In a molding machine of the class described the combination of a suitable frame, a power shaft, transverse shafts driven by the power shaft, said transverse shafts provided with pinions, rack bars adapted to mesh with the pinions mounted upon the transverse shafts, means for guiding the rack bars, sand compressors actuated by the rack bars, said rack bars provided with pins, levers adapted to be actuated by the pins and clutches slidably mounted by the power shaft and adapted to reverse the motion of the transverse shafts by intermediate gear mounted upon the power shaft and the transverse shaft and fixed bottom plates and a movable mold board, substantially as and for the purpose specified.

4. In a molding machine the combination of a suitable frame, longitudinally movable rack bars, means for moving the rack bars, sand compressors actuated by the rack bars, patterns adapted to be connected to said compressors, fixed bottom plates and a movable bottom or molding board and means for reversing the direction of motion of the rack bars and sand compressing plates, substantially as and for the purpose specified.

5. In a molding machine the combination of a suitable frame, a power shaft, transverse shafts adapted to be driven by the power shaft in opposite directions of rotation, means for reversing the direction of rotation of the transverse shafts, reciprocating rack bars and means for reciprocating the rack bars, sand compressors actuated by the rack bars, a hopper, a cut off plate, fixed bottom boards and a molding board, said cut off plate located below the hopper and above the fixed and movable bottom boards or plates and flanges adapted to support the movable bottom board, substantially as and for the purpose specified.

6. In a molding machine of the class described, the combination of a suitable frame, a power shaft, reciprocating bars, intermediate mechanism adapted to actuate the reciprocating bars, sand compressors actuated by the reciprocating bars, a fixed bottom plate and a movable bottom plate, flanges adapted to support the movable bottom and open spaces formed in the movable bottom support, substantially as and for the purpose specified.

7. In a molding machine of the class described, the combination of a suitable frame,

a power shaft, reciprocating bars, intermediate mechanism adapted to actuate the reciprocating bars, sand compressors actuated by the reciprocating bars, a flanged bottom plate and a movable bottom plate, flanges adapted to support the movable bottom located in the movable bottom support, and a movable table adapted to receive the movable bottom board, substantially as and for the purpose specified.

8. In a molding machine, the combination of a suitable frame, reciprocating bars, means for actuating the reciprocating bars and means for reversing the direction of motion of said reciprocating bars, sand compressors actuated by the reciprocating bars, a movable mold board, a mold receiving table provided with an opening, endless chains mounted upon sprocket wheels, said endless chains provided with tangs and the movable bottom boards provided with recesses and means for elevating and lowering the movable bottom board in a vertical direction, substantially as and for the purpose specified.

9. In a molding machine of the class described, the combination of a suitable frame, a power shaft, and a power wheel, a clutch slidably mounted upon the power shaft and rotatable therewith, a clutch member adapted for engagement with said slidable clutch member and means for disengaging the sliding clutch member from its opposing clutch member, compressors adapted to be actuated by means intermediate the power shaft and said compressors and means for reversing the direction of motion of said compressors, substantially as and for the purpose specified.

10. In a molding machine of the class described, the combination of a suitable frame, a power shaft journaled in said frame, beveled gear wheels rotatably and slidably mounted upon the power shaft, said gear wheels spaced from each other and tied together, a spool-shaft provided with spools, intermediate gear between the slidable gear mounted upon the power shaft and the spool shaft, a spring mounted upon the power shaft and adapted to actuate the spaced gear wheels, an L lever and a stepped bar, a follower block and a roller carried by said follower block, said roller adapted for contact with the stepped bar, a vertically movable mold carrying table and cords located around the spools upon the spool shaft and sand compressors adapted to carry patterns, and means for actuating the sand compressors, substantially as and for the purpose specified.

11. In a molding machine of the class described, a suitable frame, reciprocating sand compressors adapted to carry patterns, means for reversing the direction of motion of said sand compressors, a vertical moving table

provided with an opening, a mold board provided with recesses upon its bottom or underside, endless chains provided with tangs adapted for engagement with the recesses in
5 the bottom of the molding board and means for guiding the mold board, as and for the purpose specified.

In testimony that I claim the above, I have hereunto subscribed my name in the presence of two witnesses.

10

RICHARD C. MEYERS.

Witnesses:

GEORGE WERNER,
J. A. JEFFERS.