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MOLD FILLING AND TAMPING APPARATUS.

APPLICATION FILED SEPT. 12, 1907.

911,757.

Patented Feb. 9, 1909.

4 SHEETS—SHEET 1.

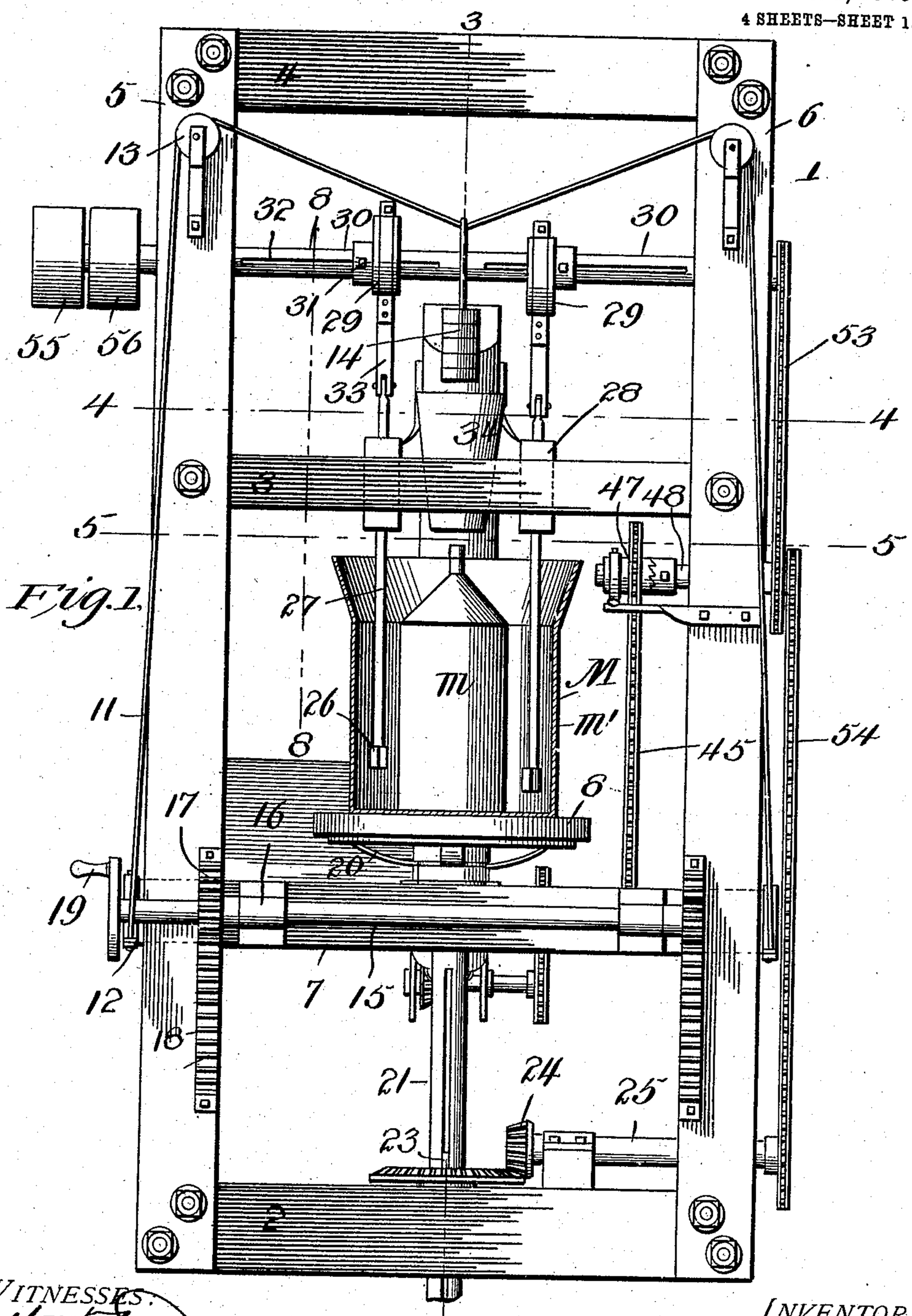

Fig. 1.

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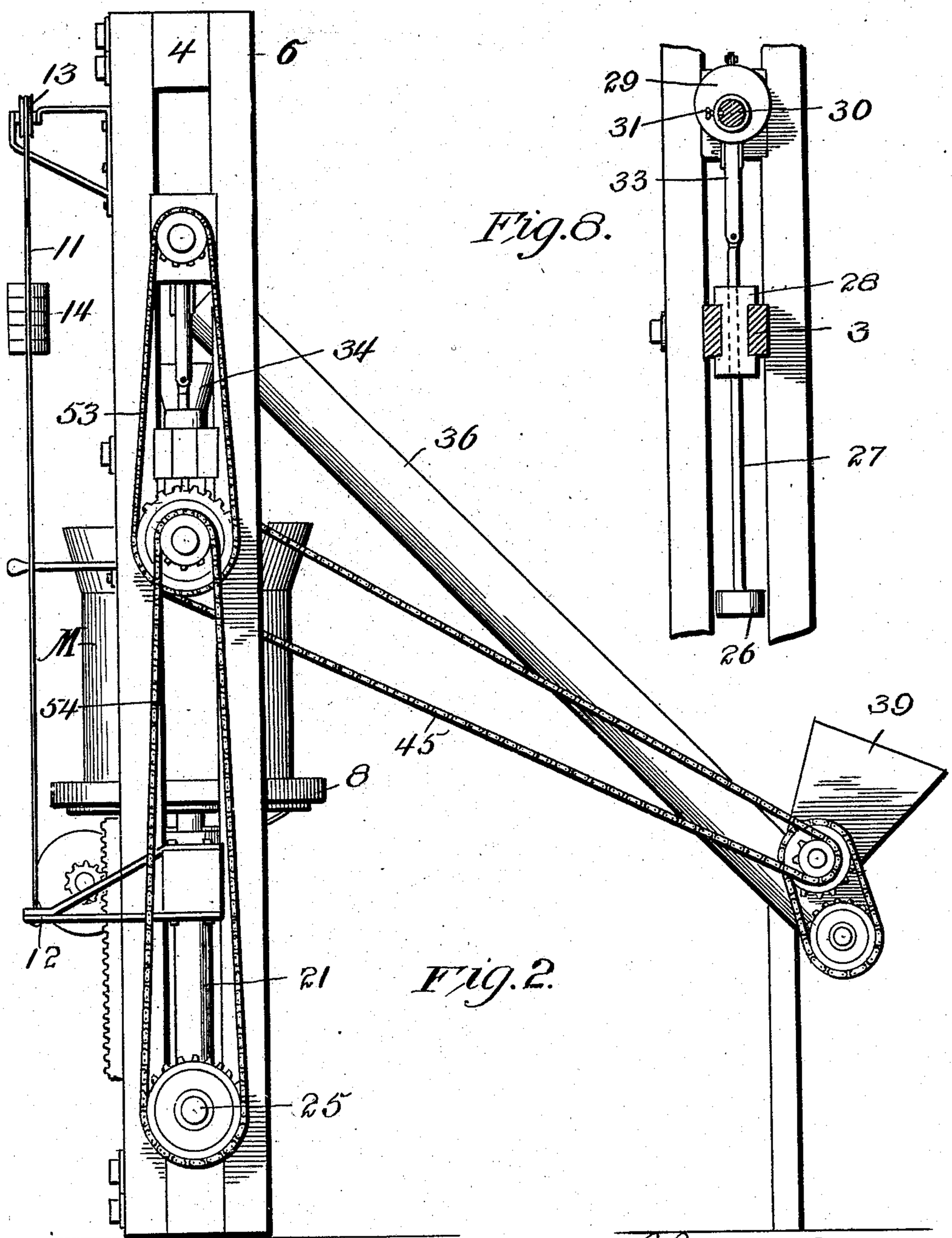

Fig. 2.

Fig. 8.

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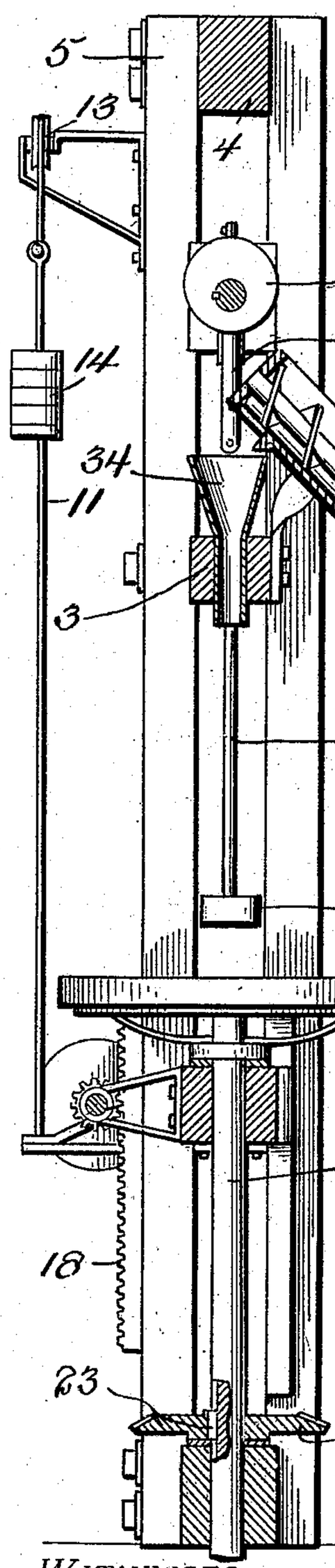
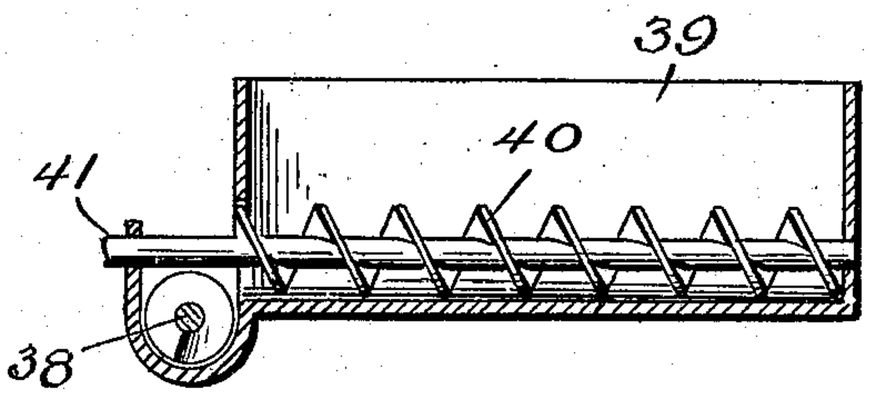


Fig. 7.



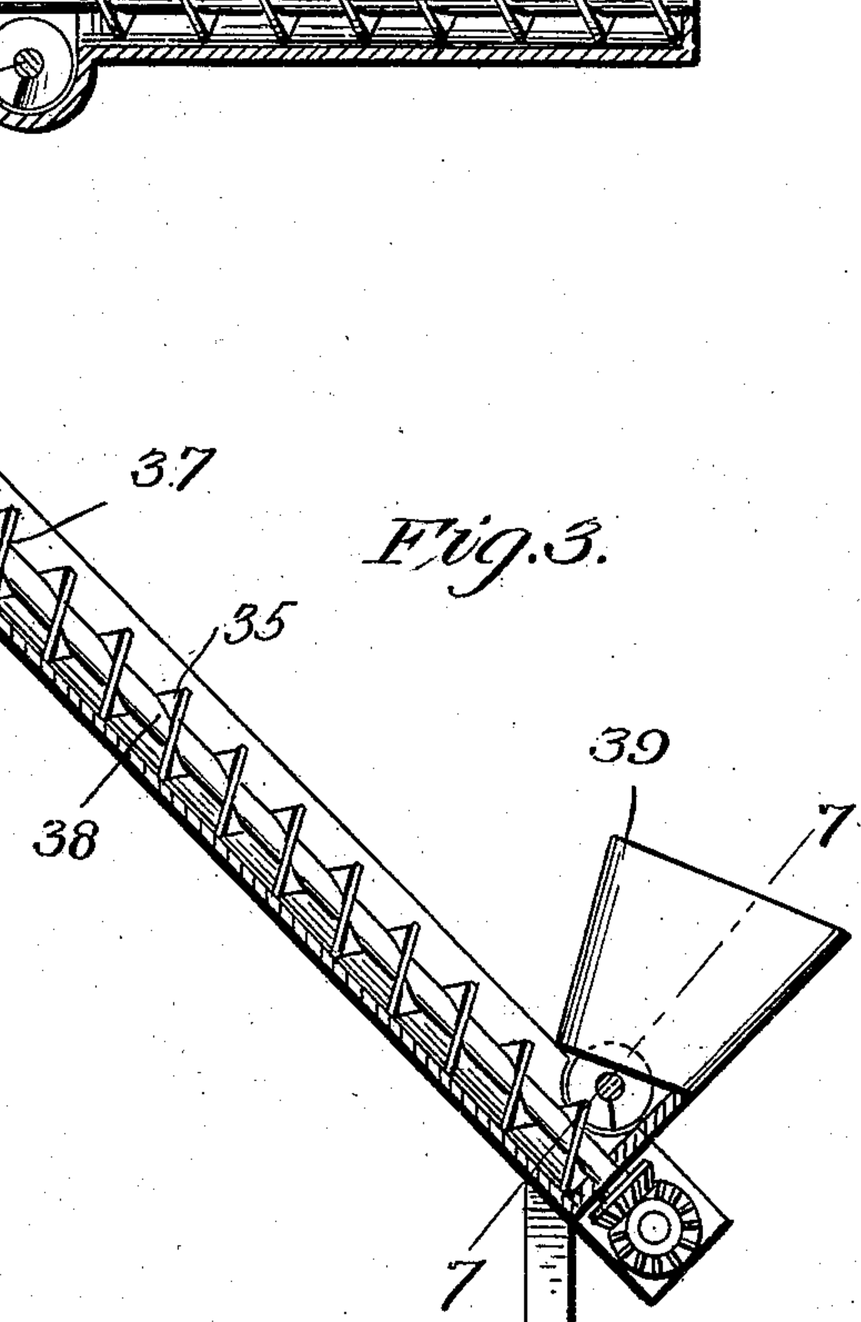


Fig. 3.

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4 SHEETS—SHEET 4.

Fig. 4.

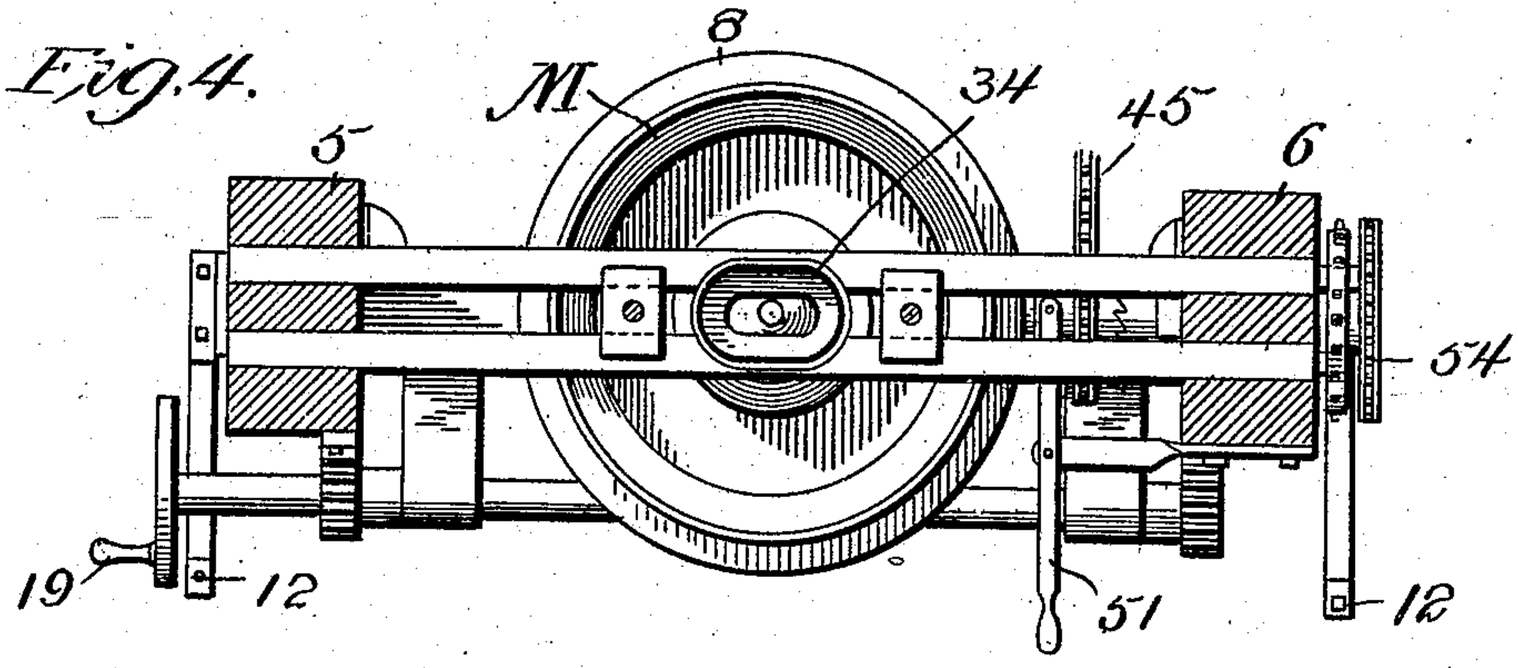


Fig. 5.

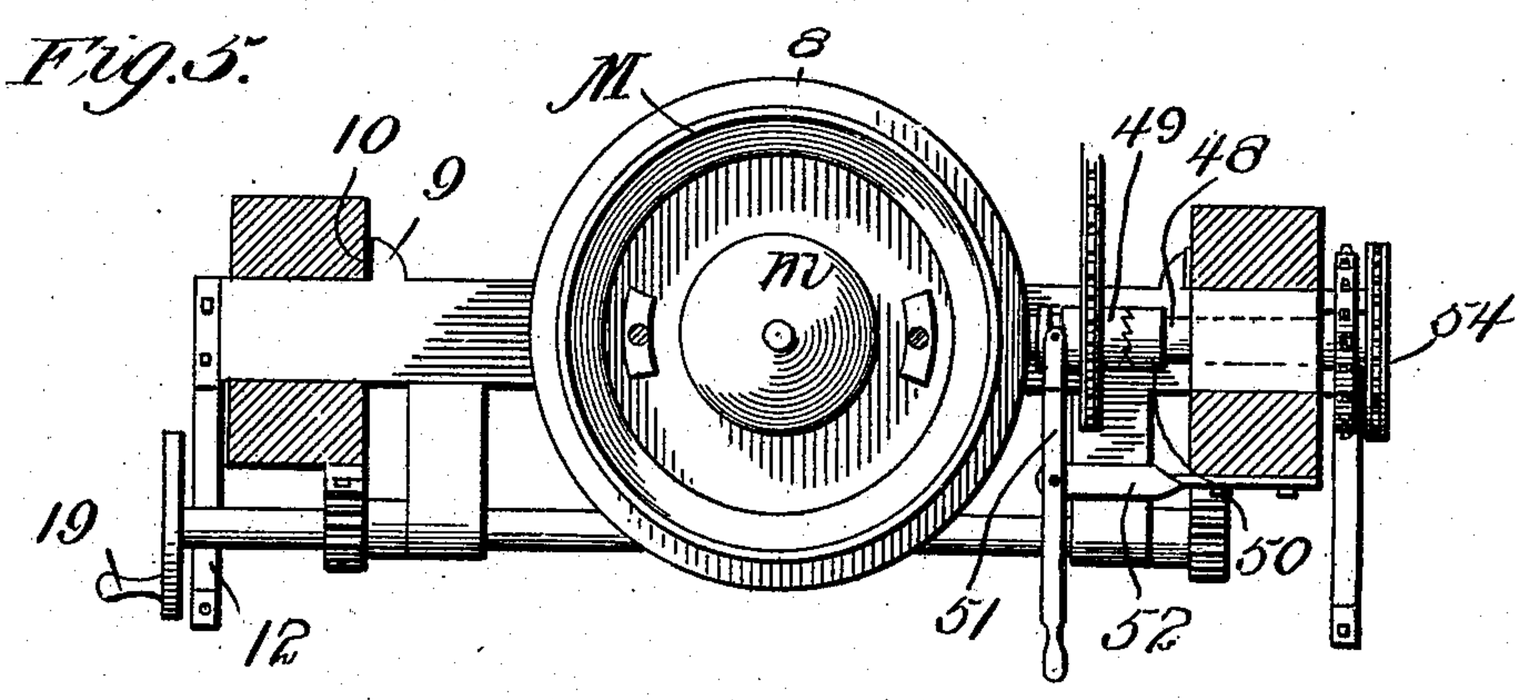
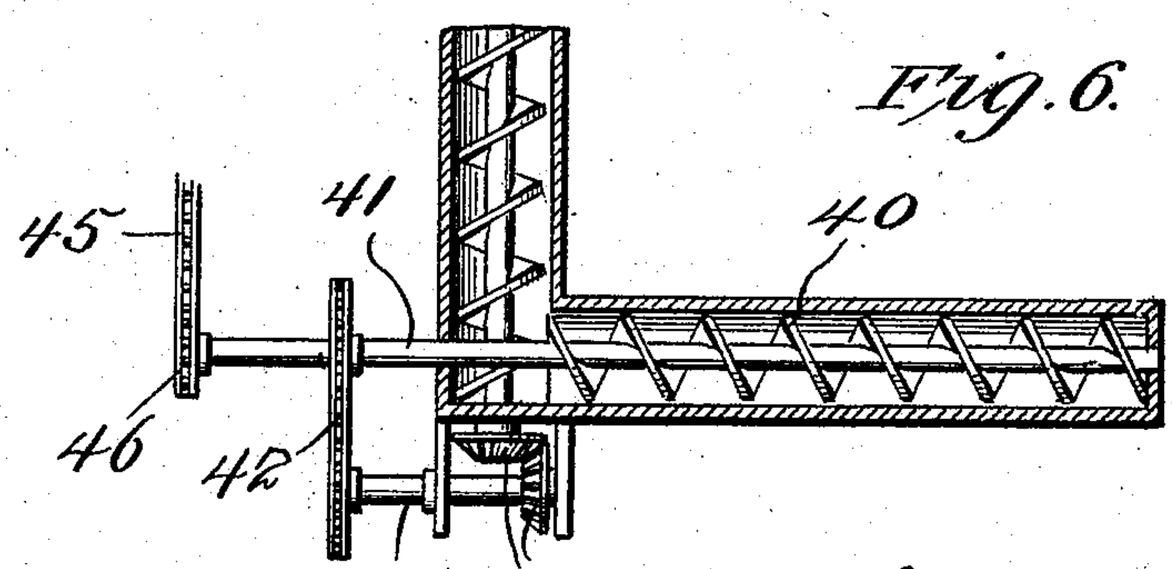


Fig. 6.



WITNESSES:

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UNITED STATES PATENT OFFICE.

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MOLD FILLING AND TAMPING APPARATUS.

No. 911,757. Specification of Letters Patent. Patented Feb. 9, 1909.

Application filed September 12, 1907. Serial No. 392,603.

To all whom it may concern:

Be it known that we, OLIVER P. RABER, RALPH L. RABER, JOHN E. LANG, and FRANCIS M. WILTROUT, citizens of the United States, residing at Corunna, in the county of Dekalb and State of Indiana, have invented certain new and useful Improvements in Mold Filling and Tamping Apparatus, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to improvements in machines for filling and tamping molds for concrete or other plastic material and to one especially designed for use in connection with a concrete tile mold set forth in Letters Patent No. 818,727 dated April 24, 1906.

One object of the present invention is to provide a machine of this character by means of which tile and other molds may be expeditiously and economically filled and tamped with comparatively small expenditure of labor and time and with practically no waste of the concrete or other plastic material.

Another object of the invention is to provide a machine of this character which will be simple and practical in construction, strong and durable in use, and convenient and easy to operate.

Further objects and advantages of the invention, and the structural features by means of which these objects are attained, will be made clear by an examination of the following specification taken in connection with the accompanying drawings in which,

Figure 1 is a front elevation of the improved machine, the mold being shown in position therein and partly in section, Fig. 2 is a side elevation of the same, Fig. 3 is a vertical section taken on the plane indicated by the line 3—3 in Fig. 1, Figs. 4 and 5 are horizontal sections taken respectively on the planes indicated by the lines 4—4 and 5—5 in Fig. 1. Figs. 6 and 7 are detail sectional views through the hopper for the plastic material and its conveyer. Fig. 8 is a detail vertical section taken on the plane indicated by the line 8—8 in Fig. 1.

The improved machine comprises an upright main frame 1 preferably of rectangular form and consisting of horizontal and cross bars 2, 3, 4, arranged between and bolted or otherwise secured to pairs of side bars 5, 6.

Arranged in the lower portion of the frame between said side bars or uprights 5, 6, is a vertically movable support 7 which carries a table 8 for the mold M that is to be filled with concrete or other plastic material. The support or carrier 7 is here shown in the form of a cross beam or bar having its ends projecting between and slidably engaged with the pairs of spaced side bars 5, 6, and also provided upon one side with laterally projecting guide lugs 9 which slidably engage vertical wear plates 10 on certain of the side bars or uprights. The support or carrier 7 is counterbalanced so that it will yieldably support the table 8 and the mold thereon beneath the tamping machine hereinafter described, and this counter balancing is preferably effected as clearly shown in Fig. 1 by providing a cable or other flexible element 11 and connecting its ends to brackets 12 projecting from the ends of said carrier.

The cable 11 passes over two guide pulleys 13 arranged in suitable supports or brackets upon certain of the bars or uprights 5, 6, and from the central portion of the cable are suspended counter balancing weights 14. The number of the weights 14 may be varied so that the mold may be held up to the tamping apparatus with any predetermined degree of pressure. We also preferably provide means for elevating the carrier which consists of a transverse shaft journaled in bearing brackets 16 projecting from one side of the carrier. On said shaft are fixed pinions 17 which mesh with vertical racks 18 upon certain of the side bars 5, 6, and upon the projecting end of the shaft 15 is provided a crank 19 which when operated will rotate the shaft and its pinions 17 to cause the latter to travel upon the rack bars 18 and thereby raise or lower the carrier 7.

The mold table 8 is here shown in the form of a circular plate secured upon a resilient metal frame 20 fixed on the upper end of a vertical shaft 21 which is mounted for both rotary and longitudinal sliding movement in bearing openings in the lower cross bar 2 of the frame and the beam or body of the carrier is more clearly shown in Fig. 3. The shaft 21 is rotated for the purpose of shifting the mold with respect to the tamping mechanism, by means of a bevel gear 22 arranged upon said shaft and having a key 23 to slide in a groove in the shaft as seen in Fig. 3. This gear is rotated by a pinion 24 on the inner end of a shaft 25 suitably mounted in

the lower portion of the frame, and since said gear is prevented from moving vertically it will rotate the shaft 21 and at the same time allow it to slide vertically with the carrier 7 as the latter is raised or lowered.

The tamping mechanism comprises one or more tamping heads 26 arranged upon the lower ends of rods 27 mounted for vertical reciprocatory movement in guides 28 located in the intermediate cross bar or member 3 of the frame. These guides are in the form of blocks formed with central openings to receive the rods 27 and having their opposite faces recessed to receive the two members of the said cross bar 3 as is more clearly shown in Fig. 8. By constructing and mounting the guides 28 in this manner it will be seen that they may be shifted longitudinally in said cross bar or toward and from the vertical axis of the machine so that the tampers may be adapted for use in molds of various kinds and sizes. The tamping rods 27 are actuated by eccentrics 29 adjustable longitudinally on a main drive shaft 30 which extends across the upper portion of the frame and is suitably journaled in bearings between the pairs of side bars 5, 6. The eccentrics 29 are preferably oppositely disposed on the shaft 30 so that the tamping heads 26 will be operated in opposite directions, they are adjustably mounted by providing them with hubs in which are arranged set screws 31. These set screws are adapted to serve both as keys and as fastening means for the eccentrics and their inner ends are adapted to project into and impinge against the bottom of one or more longitudinal grooves 32 formed in the shaft 30. It will be seen that by loosening the said screws 31 the eccentrics may be moved longitudinally of the shaft to position them above the tamping rods 27 to which they are connected by eccentric straps 33 as seen in Fig. 1.

Arranged centrally in the cross bar or member 3 of the frame is a spout or chute 34 having a funnel shaped upper end to receive the plastic material and a constricted lower end to discharge it into the mold M between its core m and its outer casing m'. The spout 34 receives plastic material from an elevator or conveyer 35 arranged in an inclined position upon the rear side of the main frame and consisting of a trough 36 and a spiral conveyer screw 37 upon a longitudinal shaft 38 in said trough. Supported upon the lower end of the trough 36 is a hopper 39 into which the concrete or plastic material is deposited and one end of which communicates with the trough. In the bottom of the trough is a spiral screw conveyer 40 which is adapted to force the plastic material into the trough 36. The screw 40 is arranged upon a shaft 41 having its projecting end connected by sprocket chain gearing 42 to a shaft 43 journaled in suitable bearings on the lower end of the trough 36 and connected to the shaft 38 by bevel gears 44. This gearing causes the conveyer shaft 38 to be driven from the shaft 41 and the latter is adapted to be driven by a sprocket chain 45 passed over a sprocket wheel 46 on one end of the shaft 41 and also over a sprocket wheel 47 on the shaft 48 journaled in suitable bearings between the side bars 6. The sprocket wheel 47 is loosely mounted upon the shaft 48 and carries a clutch member 49 to co-act with a similar clutch member 50 fixed to said shaft and said clutch member 49 is controlled by a lever 51 pivoted upon a bracket 52 on one of the side bars 6, as shown in Figs. 1 and 5. By providing this clutch it will be seen that the feeding mechanism may be thrown out of operation without stopping the tamping mechanism and that the tamping may therefore be continued after the mold is filled in order to insure the solid packing of the mold. The shaft 48 is driven from the main shaft 30 by sprocket chain gearing 53 as seen in Fig. 1, and similar gearing 54 connects the shaft 48 to the shaft 25 which latter rotates the mold table. The main shaft 30 may be driven in any suitable manner but, as shown we have provided upon one of its projecting ends tight and loose pulleys 55 and 56.

The operation of the machine is as follows: The mold is placed upon the center of the table 8 while the carrier 7 is lowered and the latter is then elevated to its position shown in Fig. 1. The drive belt is then shifted from the loose to the tight pulley of the main shaft and when the latter is rotated, the tampers 26 will be reciprocated and at the same time the table will be rotated. The clutch lever 51 is then shifted to cause the clutch members 49, 50, to engage each other so that the shaft 48 will be rotated and its motion will be imparted to the screw conveyers in the hopper 39 and the trough 36. When these conveyers are in motion the plastic material will be fed to the spout 34 and deposited from the latter into the mold in which it will be packed by the reciprocating tampers 26. As the mold is filled it will be forced downwardly, together with its table, the counter balancing weights 14 permitting the mold and its table and the carrier to move downwardly as will be readily understood. When the mold is full of plastic material the lever 51 is shifted to disconnect the clutch and throw the feeding mechanism out of operation. The tamping mechanism is then allowed to operate until the material at the top of the mold has been thoroughly tamped, whereupon the drive belt may be shifted to the loose pulley 56 to stop the machine. The mold may then be removed and replaced by an empty one which it is desired to fill. By adjustably mounting the eccentrics and the guides for

the tamping rods it will be seen that molds of various sizes and kinds may be filled by the machine, and that by counter balancing the mold support so that the mold will yield to the action of the tampers and move downwardly as it is filled, filling will be effectively accomplished and the mold will be thoroughly packed.

While the preferred embodiment of the invention is shown and described in detail it will be understood that we do not wish to be limited to the precise construction herein set forth, since various changes in the form, proportion, and minor details may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

Having thus described our invention what is claimed is,

1. In a machine of the character described, the combination of a vertical frame having upright side members united by a base member, a tamping mechanism in the upper portion of the frame, a vertical slidable carrier arranged in the lower portion of the frame and having its ends slidably engaged with said side members, means for counterbalancing said carrier to yieldably support it beneath the tamping mechanism, a vertical shaft swiveled at its upper end in said carrier and having its lower portion formed with a longitudinal groove and projecting through and slidable in the base member of the frame, a mold support upon the upper end of said shaft, a gear arranged on said shaft and swiveled to the base member of the frame, a key in said gear to slide in the groove in said shaft and to lock said gear to the latter for rotation therewith, and a driving pinion in mesh with said gear for rotating the shaft and the mold support, substantially as described.

2. In a machine of the character described, the combination of a vertical frame having side members consisting of spaced bars, a horizontally-disposed carrier bar arranged in the lower portion of the frame and having its ends slidably-arranged between the bars of said side members, guides upon the upper portions of the side members of the frame, a cable passed over said guides and having its ends connected to the ends of said carrier bar, a counterbalancing weight suspended from the central portion of the cable, a stationary support in the upper portion of the frame consisting of spaced horizontal members, guide blocks slidably arranged between said spaced members, vertical tamper rods slidable in said guide blocks, a horizontal shaft arranged in the upper portion of the frame above said stationary support and formed with longitudinal grooves, eccentrics slidable upon said shaft and having hubs formed with threaded apertures, set screws arranged in the latter and projecting into the grooves in said shafts, eccentric straps engaged with said eccentrics and connected to the upper ends of said tamper rods, a vertical shaft swiveled in said carrier bar and having its lower portion formed with a longitudinal groove, a mold support upon the upper end of said shaft, a gear swiveled in the lower portion of the frame and having a key to slide in the groove in said vertical shaft, a driving pinion in mesh with said gear, and a rack and pinion device for raising and lowering said carrier bar in the frame, substantially as described.

3. In a machine of the character described, the combination of a vertical frame having side members consisting of spaced bars, a horizontally disposed carrier bar arranged in the lower portion of the frame and having its ends slidably arranged between the bars of the side members of the frame, guides upon the upper portion of the side members of the frame, a cable passed over said guides and having its ends connected to the ends of said carrier bar, a counterbalancing weight suspended from the central portion of the cable, a tamping mechanism arranged in the upper portion of the frame, a vertical shaft swiveled in said carrier bar and having its lower portion formed with a longitudinal groove, a mold supporting plate or head upon the upper end of said shaft, a gear swiveled upon the lower portion of the frame and having a key to slidably engage the groove in said shaft, means for rotating said gear, racks upon the side members of the frame, a horizontal shaft journaled upon the carrier bar, and pinions upon said horizontal shaft and in mesh with said racks.

4. In a machine of the character described, the combination of a vertical frame, a vertically movable support in the lower portion thereof, a stationary support in the upper portion of the frame and consisting of spaced horizontal bars, guide blocks formed with centrally-disposed vertical openings and with transverse recesses in their opposite faces, said guide blocks being slidable between the spaced horizontal bars and the latter being arranged in the recesses in said blocks, vertical tamper rods slidable in the central openings in said guide blocks, and means in the upper portion of the frame and connected to the upper ends of said rods for reciprocating them.

5. In a machine of the character described, the combination of a vertical frame, a vertically movable mold support in the lower portion thereof, a stationary support in the upper portion of the frame consisting of spaced horizontal members, guide blocks slidably arranged between said spaced members, vertical tamper rods slidable in said guide blocks, a horizontal shaft in the upper portion of the frame above said stationary support, eccentrics longitudinally adjustable

upon said shaft and eccentric straps upon said eccentrics and connected to the upper ends of said tamper rods, substantially as described.

6. In a machine of the character described, the combination of a vertical frame, a vertically movable mold support in the lower portion thereof, a stationary support in the upper portion of the frame consisting of spaced horizontal members, guide blocks slidably arranged between said spaced members, vertical tamper rods slidable in said guide blocks, a horizontal shaft arranged in the upper portion of the frame above said stationary support and formed with a longitudinal groove or grooves, eccentrics slidable on said shaft and having hubs formed with threaded apertures, set screws arranged in the threaded apertures of said hubs and projecting into the groove or grooves in said shaft, and eccentric straps engaged with said eccentrics and connected to the upper ends of said tamper rods.

In testimony whereof we hereunto affix our signatures in the presence of two witnesses.

OLIVER P. RABER.
RALPH L. RABER.
JOHN E. LANG.
FRANCIS M. WILTROUT.

Witnesses:
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EUNICE RABER.