

H. P. KEYHOE & E. HANDLEY.

MOLDING MACHINE.

APPLICATION FILED JUNE 1, 1909.

960,177.

Patented May 31, 1910.

2 SHEETS—SHEET 1.

Fig. 1.

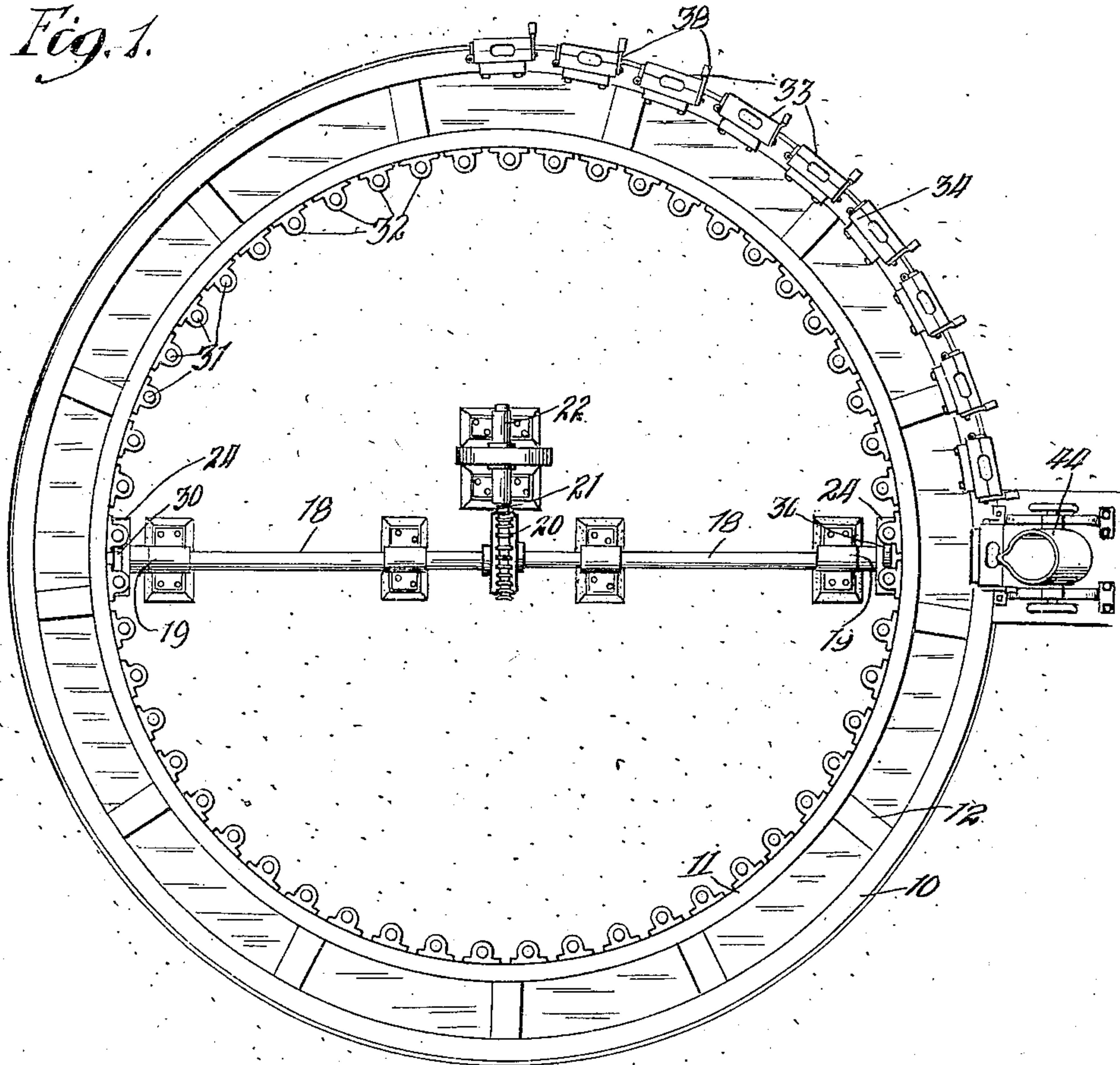
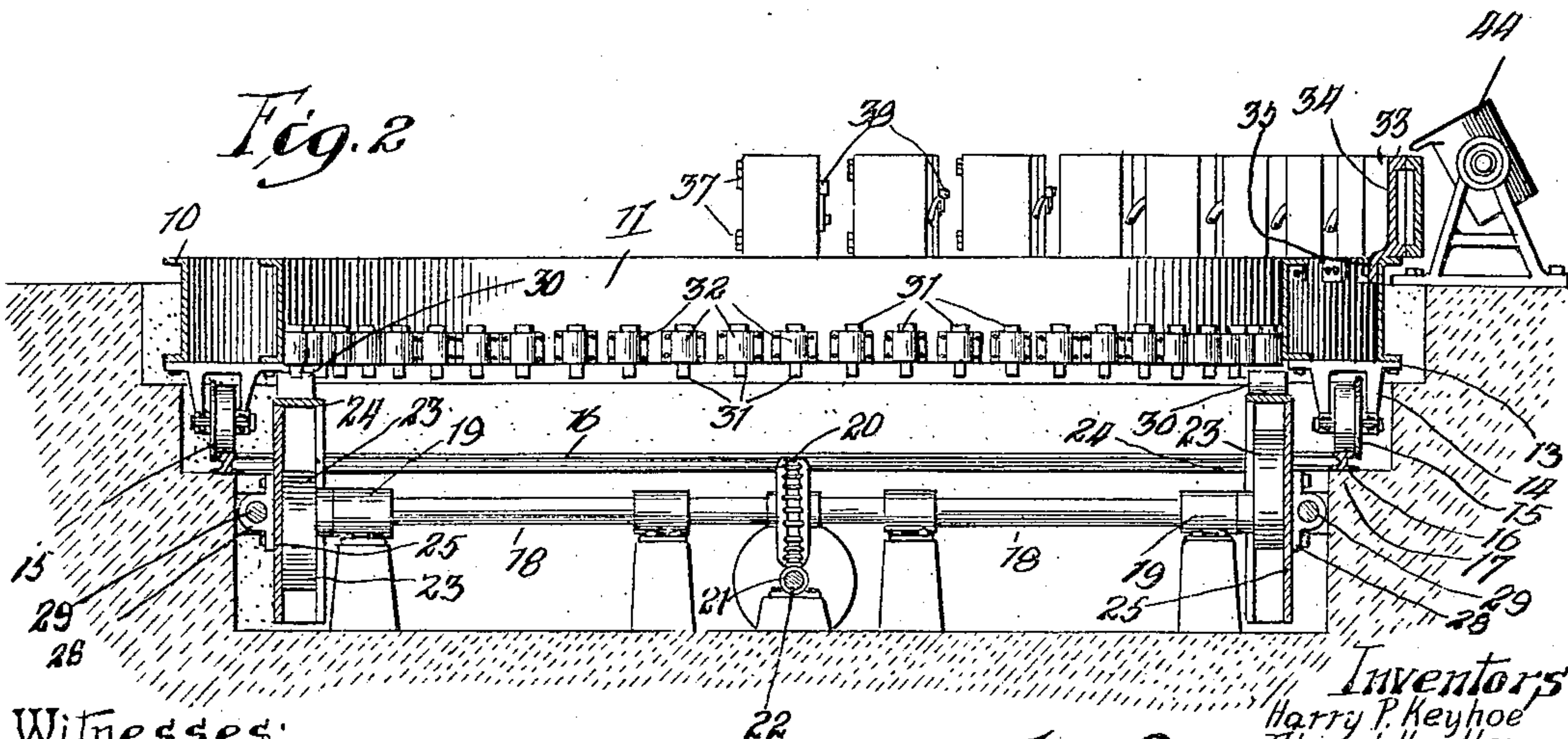


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

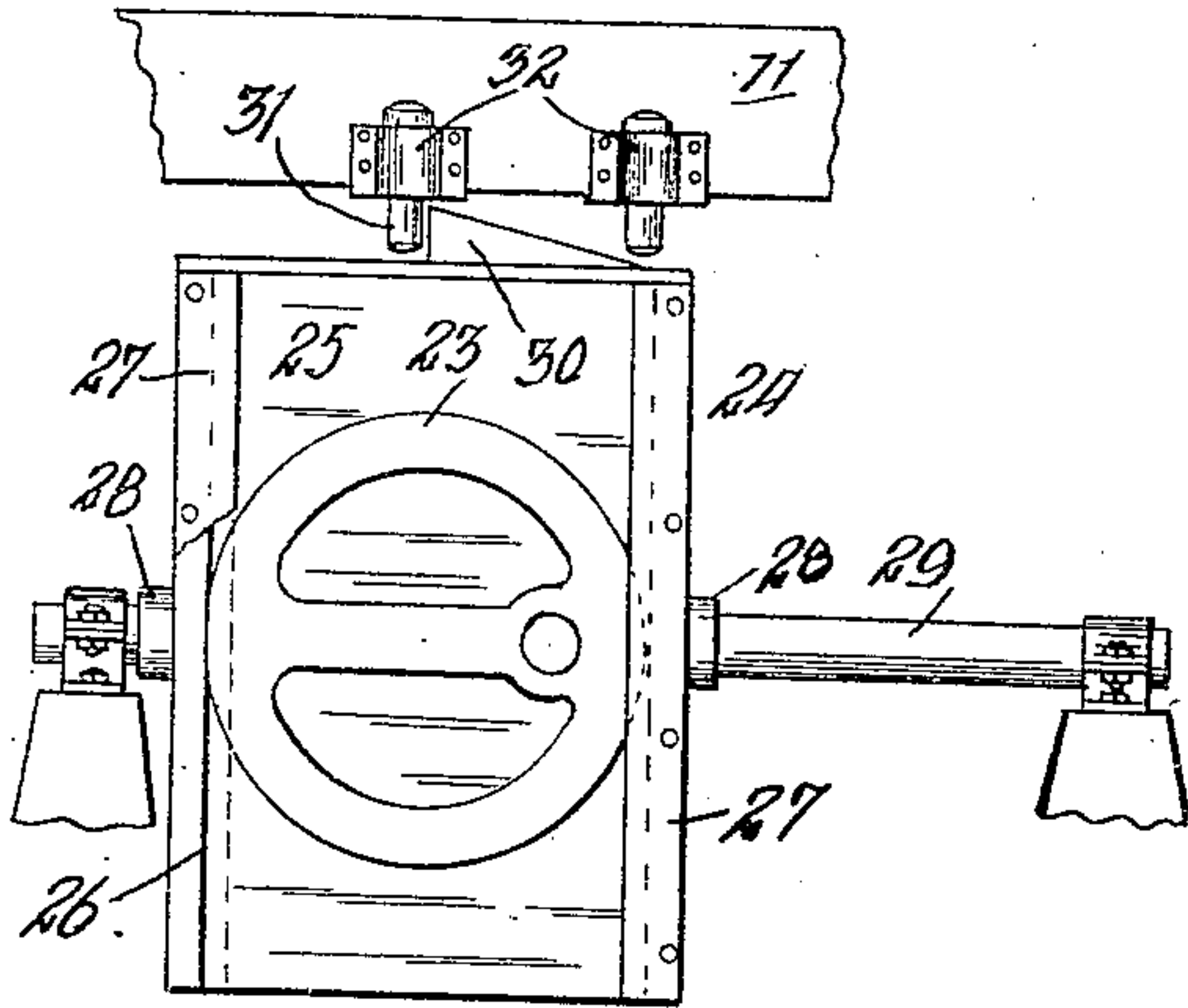


Fig. 4.

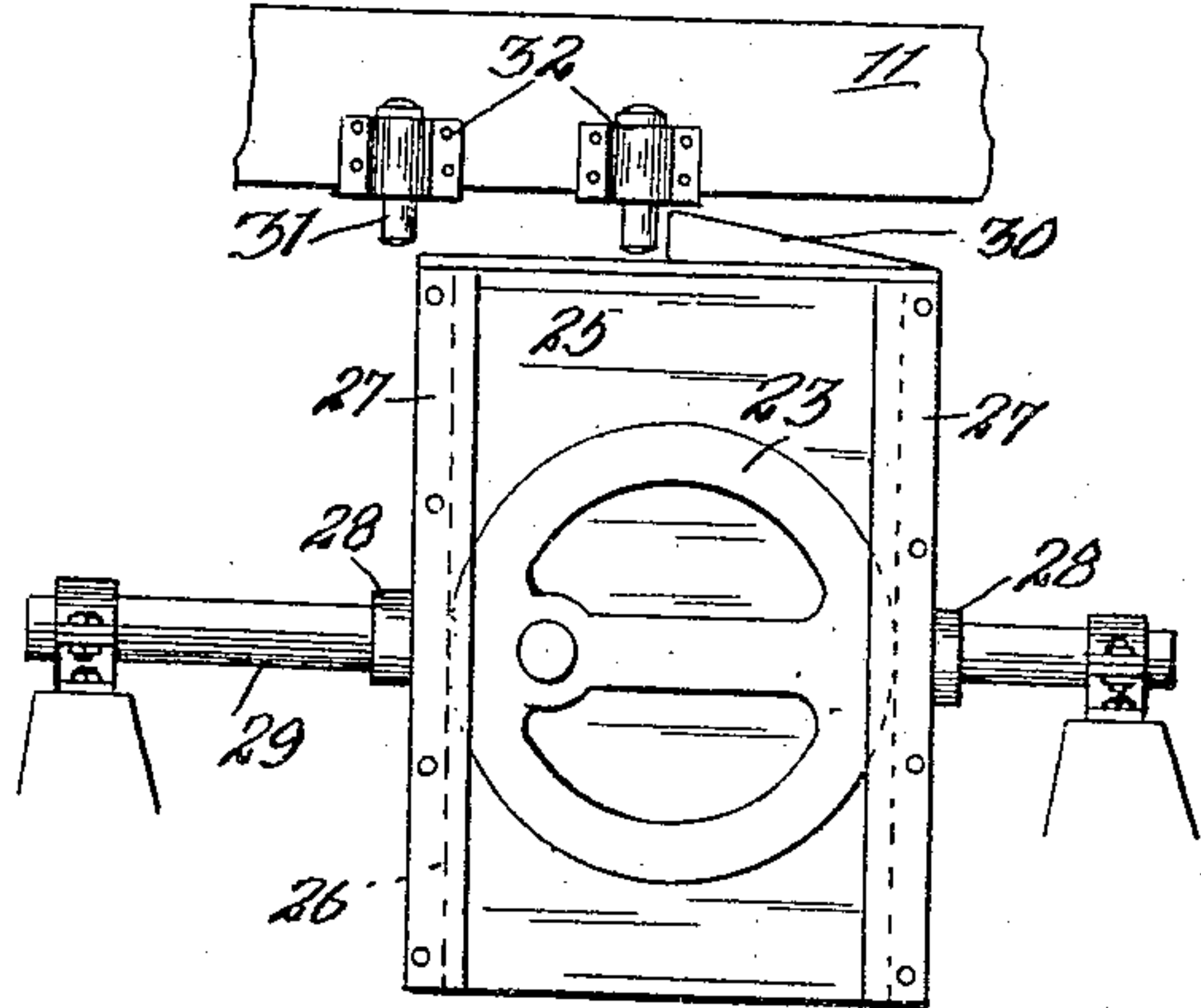


Fig. 5.

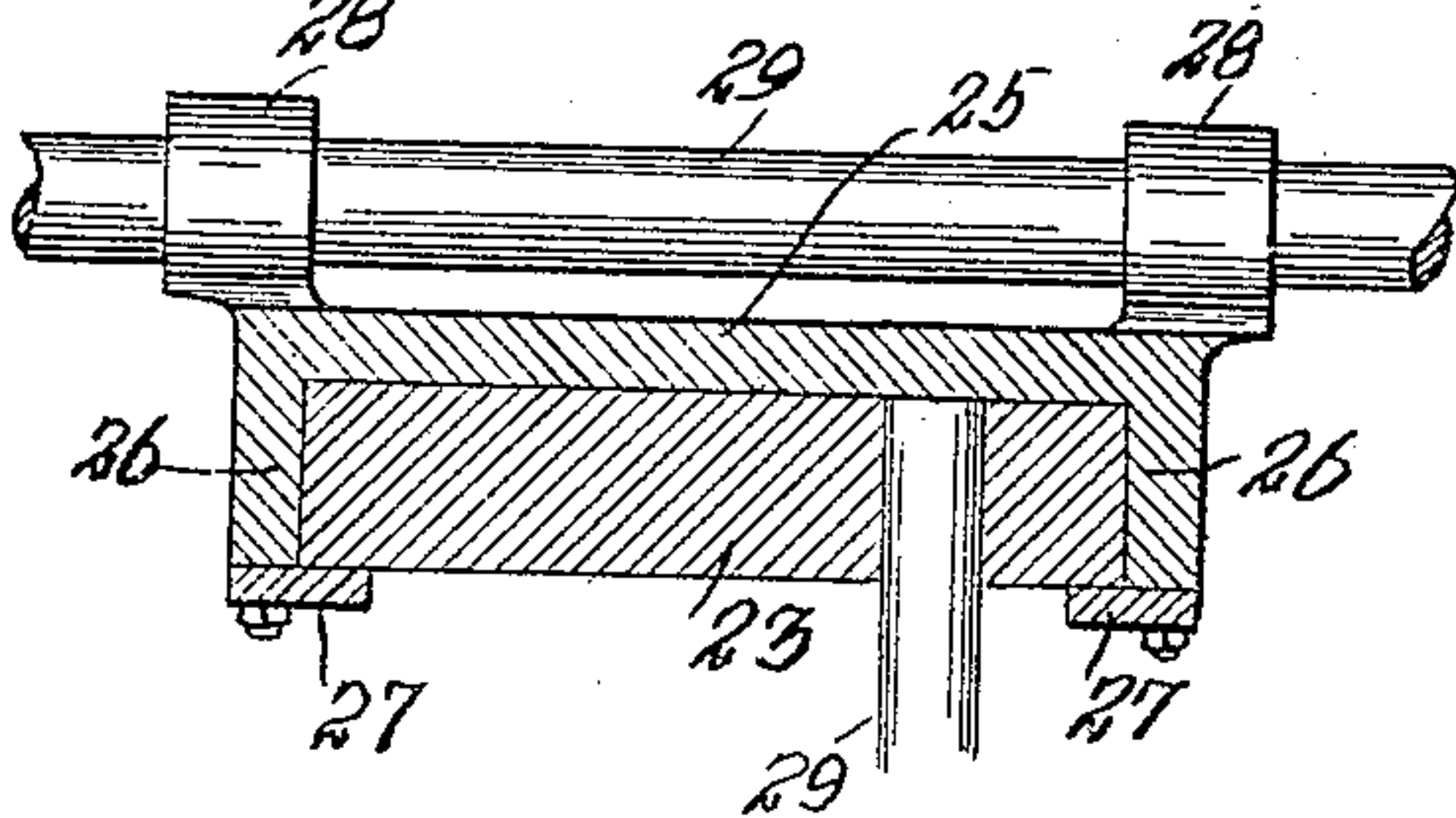


Fig. 6.

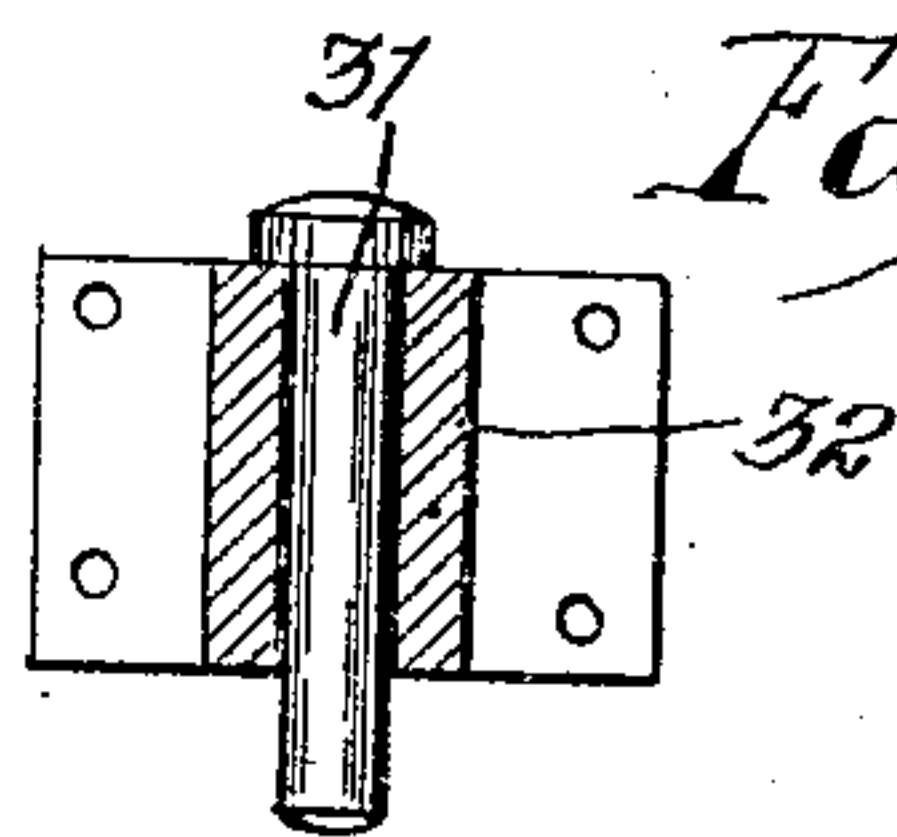


Fig. 7.

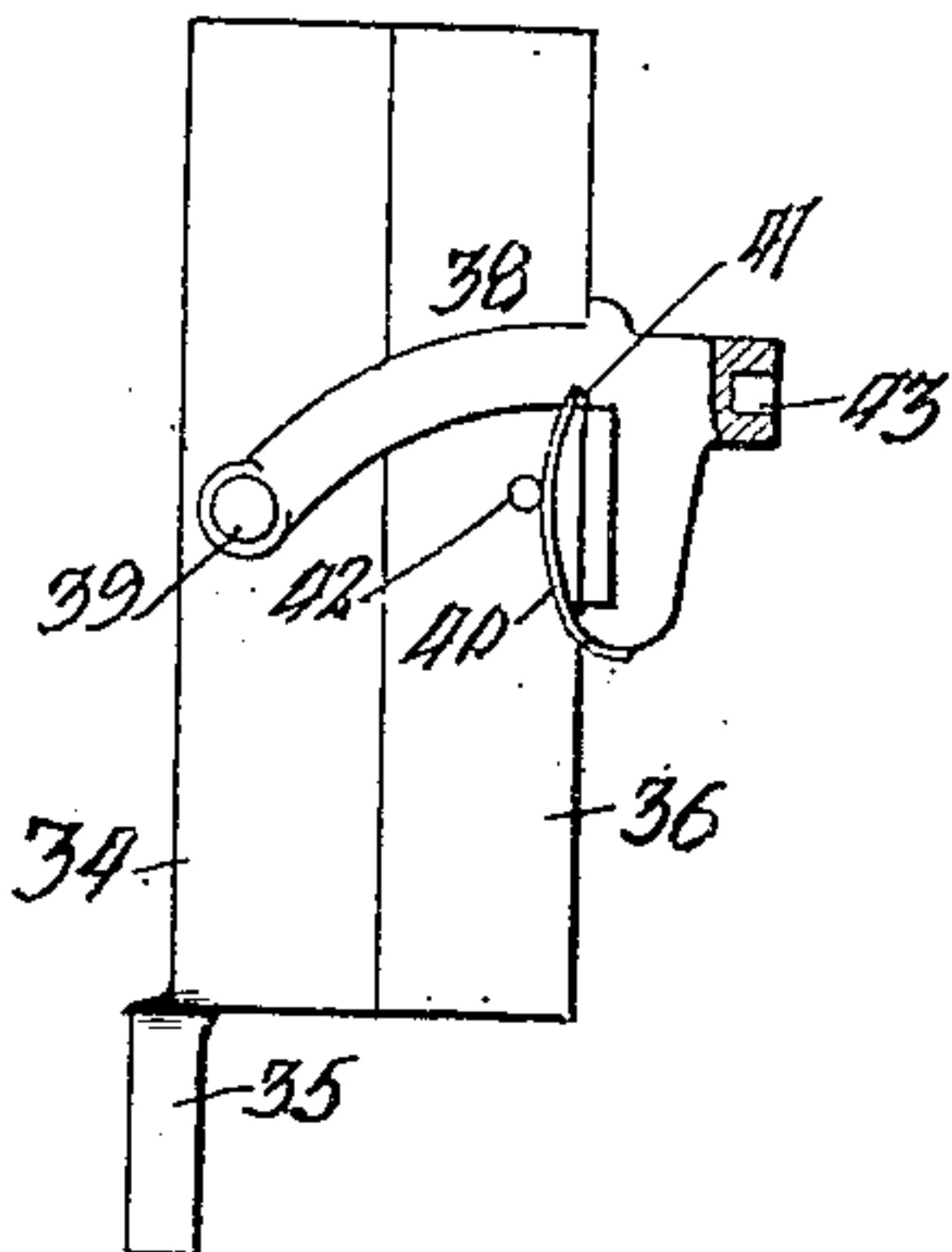
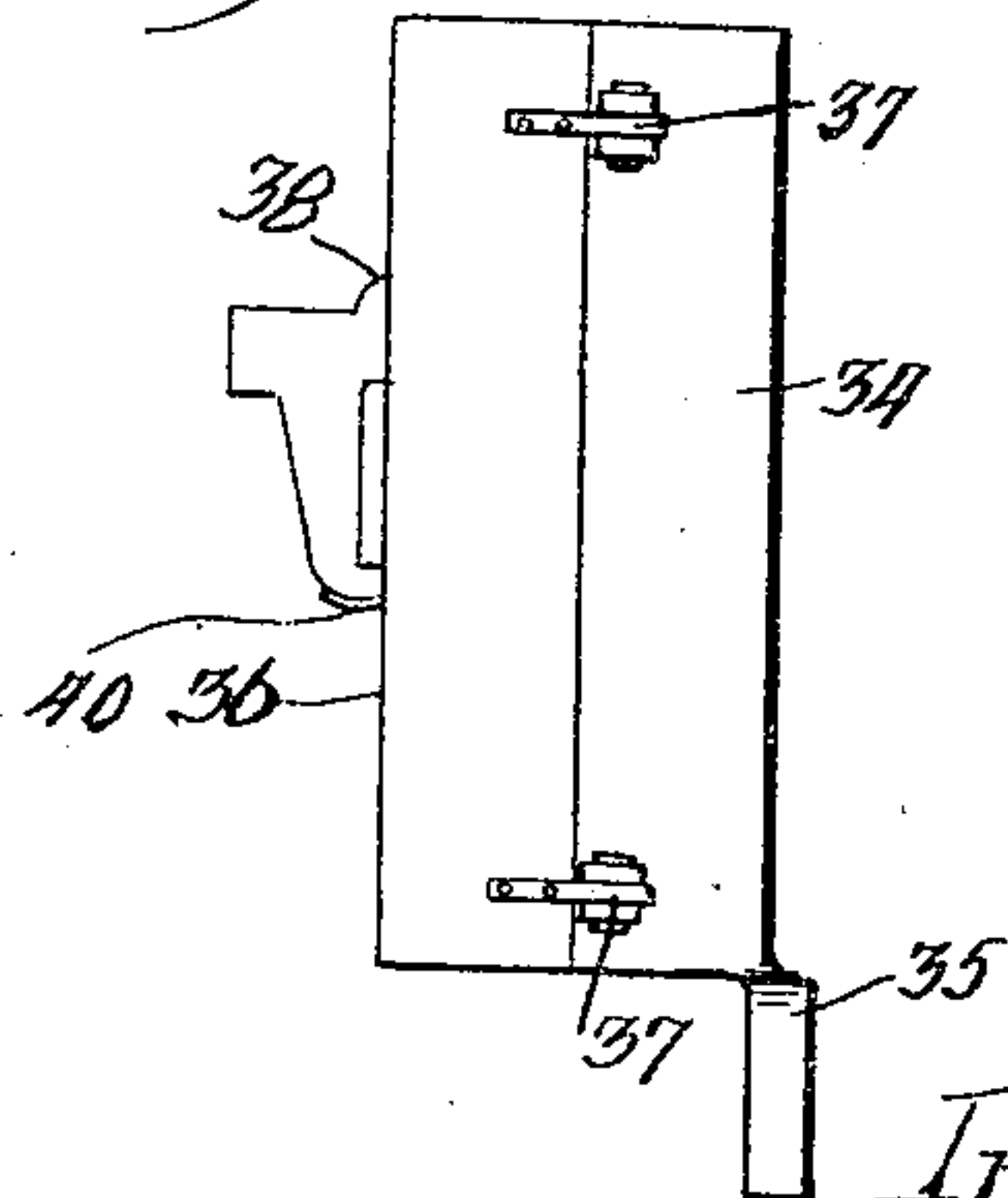


Fig. 8.



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# UNITED STATES PATENT OFFICE.

HARRY P. KEYHOE AND EDWARD HANDLEY, OF OTTUMWA, IOWA.

## MOLDING-MACHINE.

960,177.

Specification of Letters Patent.

Patented May 31, 1910.

Application filed June 1, 1909. Serial No. 499,495.

*To all whom it may concern:*

Be it known that we, HARRY P. KEYHOE and EDWARD HANDLEY, both citizens of the United States, residing at Ottumwa, in the county of Wapello and State of Iowa, have invented certain new and useful Improvements in Molding-Machines, of which the following is a specification.

This invention relates to a molding machine, in the form of a turntable, adapted to carry a large number of chill molds, and so arranged as to bring the molds successively into position to receive a charge of molten metal from the ladle.

The object of the invention is to so construct and arrange the turntable that it will afford a firm and substantial carriage for the molds and provide intermittent feeding mechanism for the table in order to bring the molds successively into charging position.

The invention further relates to the construction and arrangement of the molds themselves, whereby danger of breakage, due to sudden expansion of the molds under heat, will be obviated, and to the construction and arrangement of the molding machine as a whole and the individual parts thereof.

Further objects will appear from a detailed description of the invention, which consists in the features of construction and combination of parts hereinafter described and claimed.

In the drawings, Figure 1 is a plan view of the molding machine, as a whole, showing a portion of the molds mounted in position; Fig. 2 a longitudinal sectional view of the same; Figs. 3 and 4 details of a cam for intermittently moving the turntable; Fig. 5 a cross sectional detail of the same, showing the guide rod for the housing; Fig. 6 a detail of one of the ratchet pins, showing the housing in section; and Figs. 7 and 8 details of one of the molds, showing the method of hinging and locking the same.

The machine is constructed in the form of a turntable, having a main frame comprising an outer circular ring 10 of channel formation, and an inner circular ring 11 likewise of channel formation, each of the rings having the flanges toward the outside and of a size to afford considerable space between the rings, save where they are connected by means of spacing blocks 12, pref-

erably of cast iron, which are set in between the rings and are rigidly bolted or otherwise secured to each. A further connection is afforded by a plurality of base plates 13 which are bolted or otherwise secured to the under flanges of the rings comprising the frame, which base plates afford a mounting for a plurality of wheel brackets 14 which serve to afford journal bearings for a plurality of flanged wheels or rollers 15 which ride upon a circular track 16 supported upon a suitable foundation 17, of cement or masonry, which is hollowed out in the form of a pit or depression of suitable size to accommodate the turntable. Within the pit is a main shaft 18, which finds a bearing in suitable journal boxes 19 and is provided, in its center, with a worm wheel 20 in mesh with a worm 21, on a power shaft 22. The main shaft extends transversely below the center of the turntable and is provided, at each end, with a driving cam 23, each of the cams being in the form of a circular disk or wheel eccentrically mounted on the shaft. The pitch of the two cam disks is such that they will act in opposition to one another, one projecting from one side of the shaft, and the other from the opposite side of the shaft. Each of the cams is mounted within an open housing 24, comprising an outer flat wall 25 against which the outer flat face of the cam disk abuts, and vertical end walls 26, which are provided with plates 27 overhanging the inner face of the cam sufficiently to hold the housings in parallel relation with the inner and outer faces of the cam disks. Each of the housings is provided, on its rear or outer side, with a pair of lugs 28 which ride upon a guide rod 29, extending at right angles to the main shaft and beneath the frame of the turntable, as best shown in Fig. 2. Each of the housings is provided, on its top, with a beveled ratchet tooth 30 adapted to successively engage a plurality of ratchet pins 31, each of which is slidably mounted within a bracket 32, bolted or otherwise secured to the inner face of the inner ring of the frame. The pins, when in normal position, will project down below the level of the beveled ratchet teeth and in position to be engaged by the same. The throw of the cams is greater than the distance between adjacent pins, so that, with the inner movement of each of the cams, the housing will be retracted away from the previously engaged



pin, until the ratchet tooth assumes a position behind the next adjacent pin and in preparation for the return or feeding movement of the ratchet tooth. The upper flange  
 5 of the outer ring serves as a base or support for a plurality of chill molds 33, each consisting of a fixed section 34 provided, on its inner edge, with a depending tongue 35 adapted to abut against the inner side  
 10 of the outer ring to which the tongue is secured by means of bolts or similar attaching means, the fixed section of the mold meanwhile resting flat upon the top of the flange. The fixed section of the chill mold cooperates with a hinged section 36, connected  
 15 on one side with the fixed section by means of hinges 37. The fixed and movable sections are adapted to be locked by means of a latch 38, substantially in the form of an  
 20 L lever, the long arm of which is pivoted to the fixed section of the mold at the point 39, and the short arm of which receives the lower end of a bow spring 40, the upper end being entered into a notch 41 on the  
 25 under side of the long arm of the latch lever, as shown in Fig. 7. The spring is adapted to abut against a stud 42, which outwardly projects from the hinged section, with the result that the two sections will be held closed  
 30 under spring tension and provision is made for sudden expansion of the mold, due to the inpouring of the molten metal. The L latch is provided, near its elbow, with an outwardly projecting recessed boss 43, which  
 35 affords a socket for the insertion of an iron bar or other implement intended to be used in opening and closing the mold.

At a suitable point outside of the periphery of the turntable is located a trunnioned  
 40 ladle 44, adapted to be tilted to bring its mouth into position to deliver a charge of molten metal into the molds as they are successively brought into register with the ladle.

In operation, the rotation of the power  
 45 shaft serves to rotate the main shaft, and this rotation of the main shaft causes the cam disks to simultaneously impart reciprocating movements, in opposite directions, to the cam housings. These movements of the  
 50 housings will cause the ratchet tooth to engage successive pins on opposite sides of the turntable, whereby the latter will be intermittently rotated by power applied on opposite sides thereof. The pins are so mounted  
 55 that they will ride up on the beveled sides of the ratchet teeth and thereafter drop by gravity into position to be engaged by the teeth in preparation for the return or feeding movement of the teeth. By applying  
 60 the power equally on opposite sides of the turntable, the force necessary to drive the turntable will be balanced and equalized and the table rotated smoothly on its track. The spring latches of the chill molds are so  
 65 arranged that when the latch is dropped the

spring will impinge against the stud 42 and force the sections of the mold firmly together, and at the same time will have excessive expansion if such should take place.

The construction and method of rotating  
 70 the turntable is such that the former can be made of a size sufficient to accommodate and support a large number of molds, without danger of breakage and without difficulty in the transmission of power.  
 75

Although the construction and mode of operation of the turntable has been described with considerable particularity, it is not the intention to limit the invention to the exact features hereinbefore described, since the  
 80 construction, mounting, and method of operating the turntable might be modified to a considerable extent without departing from the spirit of the invention. It is desirable that the turntable should carry a sufficient number of molds and be operated at  
 85 such a speed as to give the maximum output and at the same time permit the molds to discharge the castings and receive a new charge of molten metal at such time as to  
 90 maintain the molds at a substantially constant temperature, which is desirable in order to preserve them from deterioration.

What we regard as new and desire to secure by Letters Patent is:

1. In a molding machine, the combination  
 95 of a turntable, molds carried by the turntable in the form of a circular rim, said rim being composed of independent inner and outer rails held together by spacing plates, a ladle in position to pour charges of metal successively into the molds, means for imparting an intermittent rotary movement to the turntable, said means comprising oppositely disposed ratchet teeth adjacent to the  
 100 turntable, means for actuating said ratchet teeth, a continuously driven shaft upon which said means are mounted, and pins adapted to be engaged by said ratchet teeth, substantially as described.  
 110

2. In a molding machine, the combination  
 115 of a turntable, molds carried by the turntable, a ladle mounted in position to pour charges of metal successively into the molds, means for imparting an intermittent rotary movement to the turntable, said means comprising a ratchet tooth on each side of and below the turntable, pins adapted to be engaged by said ratchet teeth, two cams for actuating said ratchet teeth in unison with  
 120 one another, and a shaft on which said cams are mounted, substantially as described.

3. In a molding machine, the combination  
 125 of a turntable in the form of a circular rim, composed of inner and outer rails and spacing pieces, wheels journaled to the turntable, a track upon which the wheels revolve, molds carried by the turntable, a ladle adapted to deliver charges of metal successively to the molds, and oppositely  
 130



disposed means located beneath the turntable for imparting an intermittent rotary movement to the turntable, substantially as described.

5 4. In a molding machine, the combination of a turntable in the form of a circular rim, composed of inner and outer rails and spacing pieces, wheels journaled to the turntable, a track upon which the wheels revolve, 10 molds carried by the turntable, a ladle adapted to deliver charges of metal successively to the molds, means for imparting an intermittent rotary movement to the turntable, said means comprising a ratchet 15 tooth on each side of and below the turntable, and pins adapted to be engaged by said ratchet teeth, substantially as described.

5 5. In a molding machine, the combination of a turntable comprising inner and outer 20 rails and spacing pieces, wheels journaled to the turntable, a track upon which the wheels revolve, molds carried by the turntable, a ladle adapted to deliver charges of metal successively to the molds, means for 25 imparting an intermittent rotary movement

to the turntable, said means comprising a ratchet tooth on each side of and below the turntable, pins adapted to be engaged by said ratchet teeth, two cams for actuating said ratchet teeth in unison with one an- 30 other, and a shaft on which said cams are mounted, substantially as described.

6. In a molding machine, the combination of a turntable, wheels journaled to the turntable, a circular track around which the 35 wheels revolve, slidable ratchet pins carried by the turntable, slidably mounted housings located on each side of and below the turntable, each of the housings carrying a ratchet tooth, an operating shaft, a pair of oppo- 40 sitely disposed eccentrics mounted upon the operating shaft and adapted to actuate the housings, and means for rotating the operating shaft, substantially as described.

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