

H. P. TOWNSEND.
GROOVING MACHINE.
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916,226.

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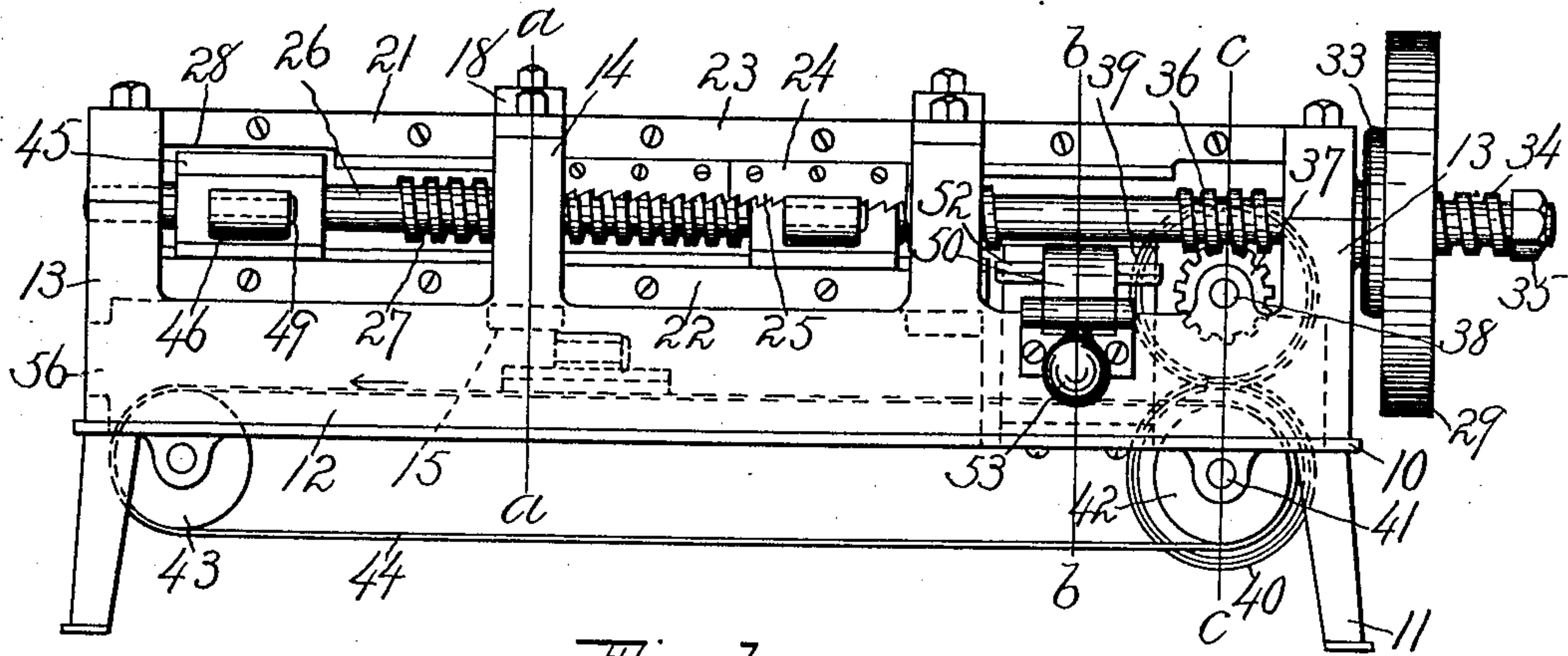


Fig. 1.



Fig. 5.

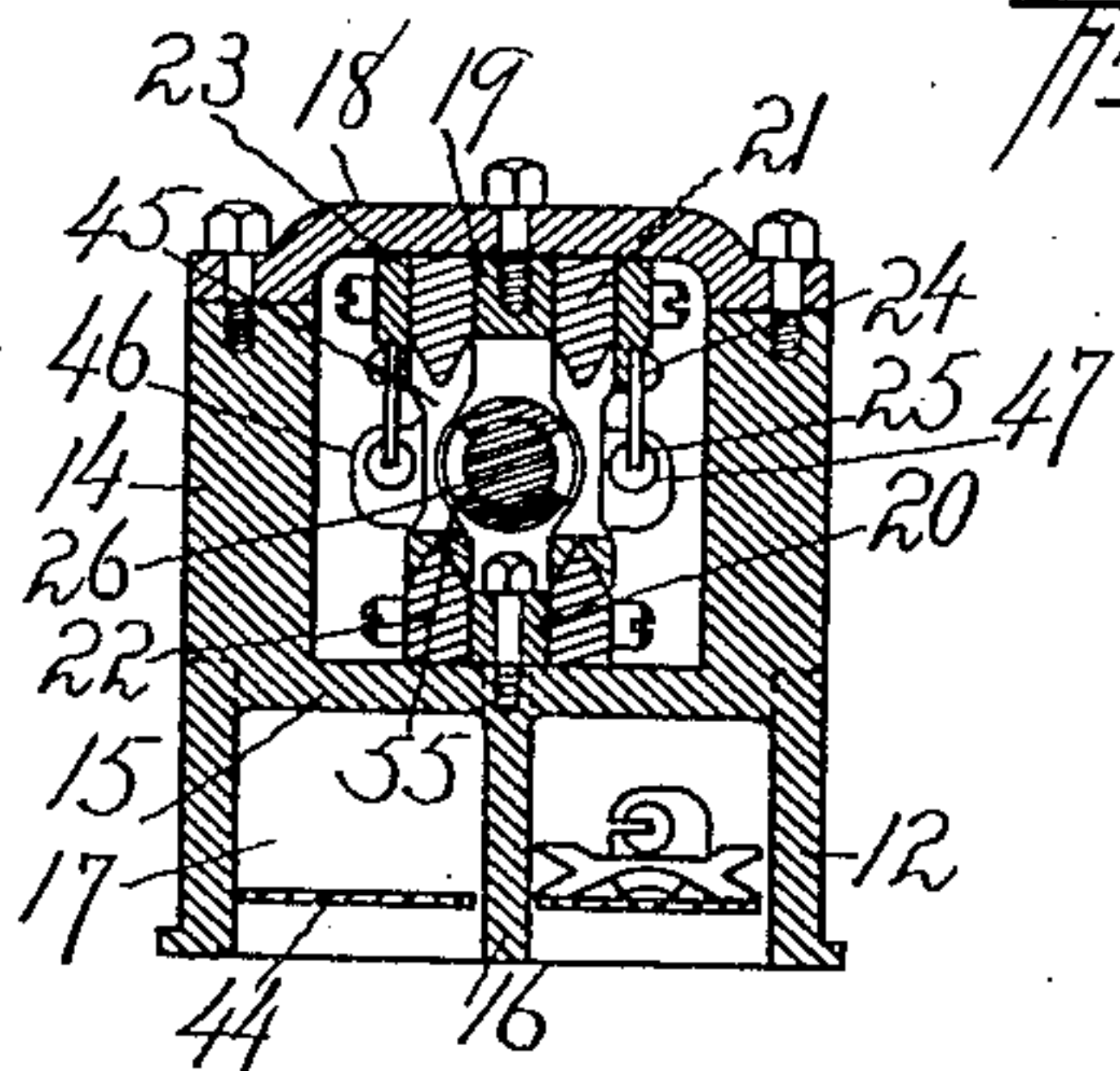


Fig. 2.

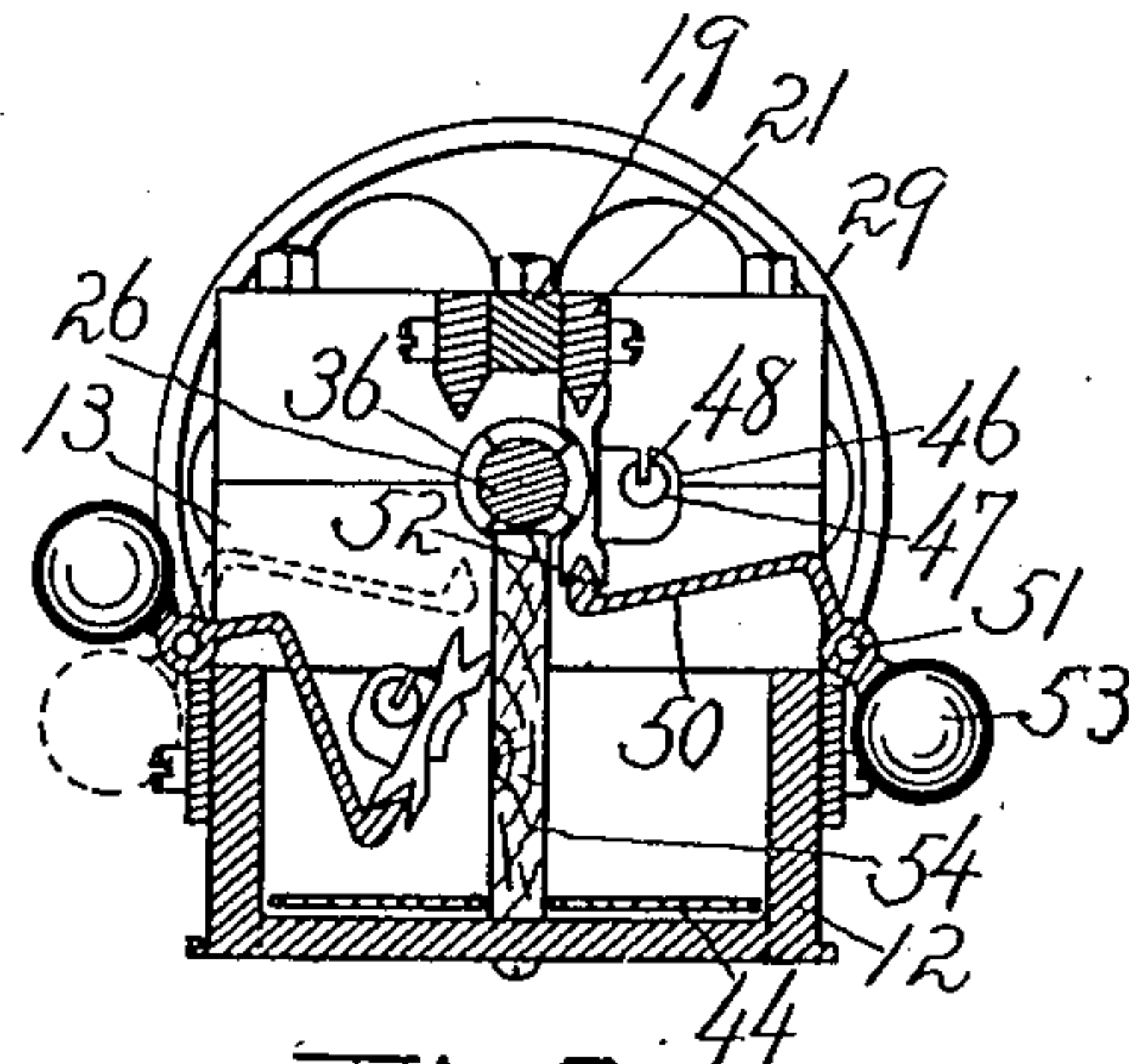


Fig. 3.

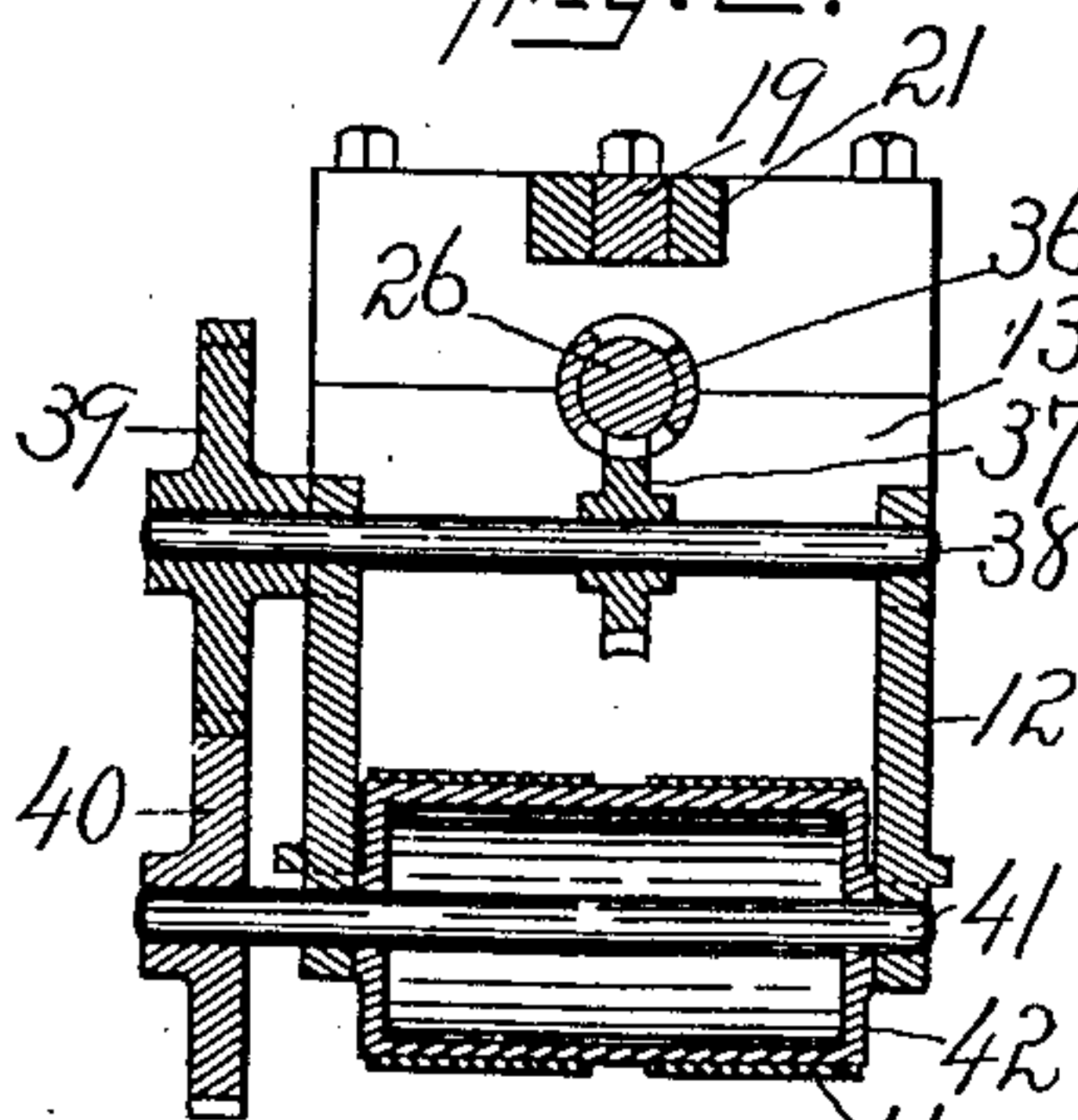


Fig. 4.

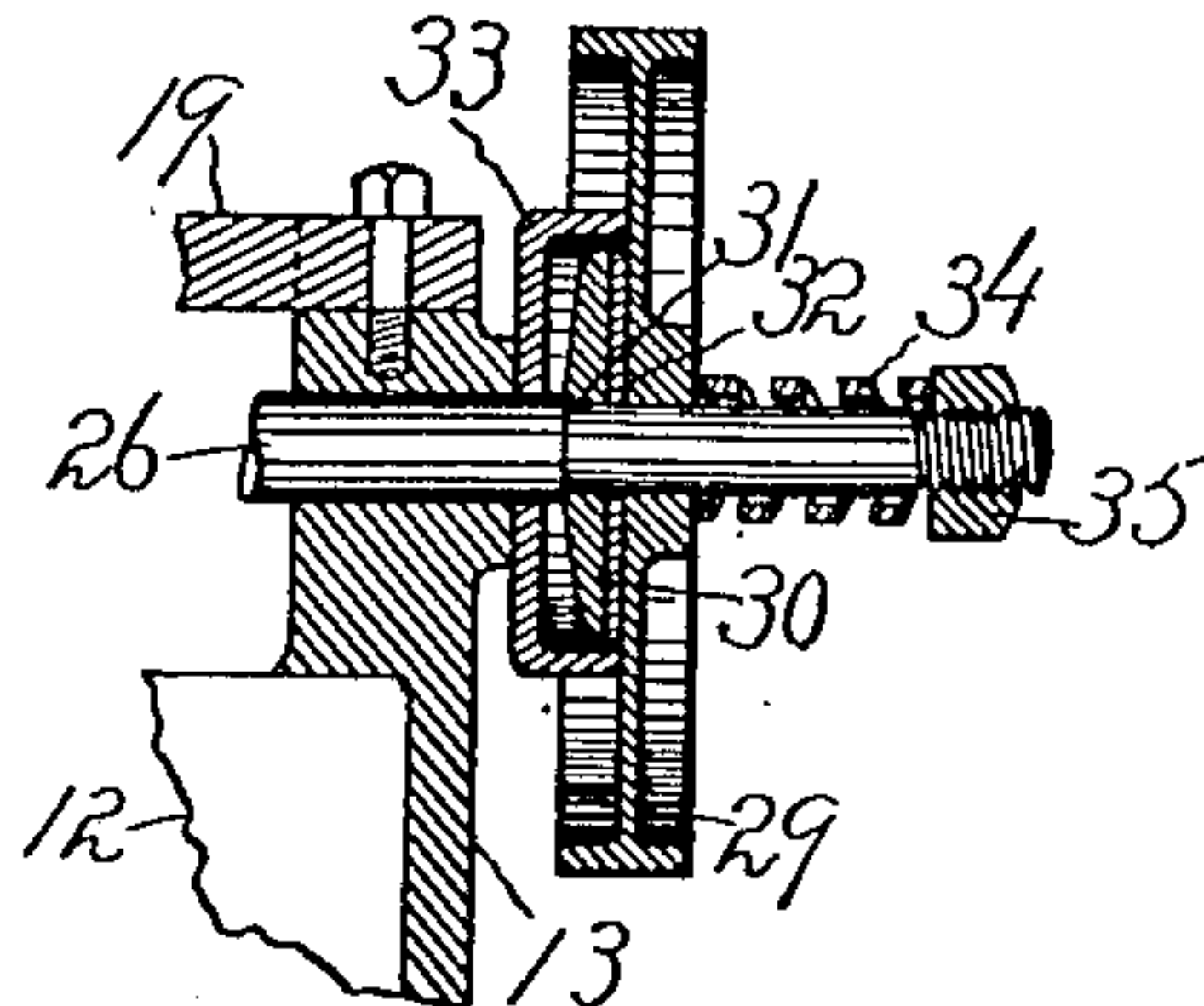


Fig. 5.

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UNITED STATES PATENT OFFICE.

HARRY P. TOWNSEND, OF NEW BRITAIN, CONNECTICUT, ASSIGNOR TO THE CORBIN CABINET LOCK COMPANY, OF NEW BRITAIN, CONNECTICUT, A CORPORATION OF CONNECTICUT.

GROOVING-MACHINE.

No. 916,226.

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To all whom it may concern:

Be it known that I, HARRY P. TOWNSEND, a citizen of the United States, and a resident of New Britain, in the county of Hartford and State of Connecticut, have invented a new and Improved Grooving - Machine, of which the following is a specification.

My invention relates more especially to that class of machines used for producing a groove or other cut in a piece of metal; and the object of my invention is to provide a machine of this class that shall be extremely rapid and efficient in its operation; and a further object of the invention is to provide such a machine that shall require little attention in its operation; and a further object of the invention is to provide a machine of this class in which liability to breaking of parts shall be reduced to a minimum. A form of device in the use of which these objects may be attained is illustrated in the accompanying drawings, in which—

Figure 1 is a view in side elevation of a machine embodying my invention. Fig. 2 is a view in cross-section through the same on the line *a—a* of Fig. 1, looking toward the right, parts beyond being omitted. Fig. 3 is a like view on the line *b—b* but looking toward the left, parts beyond being omitted. Fig. 4 is a like view on the line *c—c*, parts beyond being omitted. Fig. 5 is a view in lengthwise section on the axis of the main shaft showing the construction of the clutch. Fig. 6 is a detail side view, on enlarged scale, of one of the carriages.

In the accompanying drawings the numeral 10 indicates a table supported by legs or standards 11. These may be of any desired form and construction and of suitable material. A frame of suitable material and of proper form and construction is supported by this table, this frame consisting of a base 12 which includes side parts extending from end to end of the machine and resting on the table. The frame also includes end pieces 13, which may extend across the machine from side to side and intermediate supports 14 disposed at proper intervals between the end pieces. Cross pieces 15 extend between the intermediate supports 14 at the bottom thereof, and a web 16 depends from these cross pieces and extends between the side parts of the base 12 from one end of the ma-

chine to a delivery point, to be hereinafter described, forming carrier chambers 17. Arches 18 extend between the intermediate supports 14 at the top thereof, being suitably secured in any desired manner.

An upper rail supporting bar 19 extends between the end pieces 13, being secured thereto in any desired manner, and also being secured to the under surface of the arches 18, as by means of bolts passed through the arches into the bar. A lower rail supporting bar 20 is located immediately underneath the bar 19 and is secured to the end pieces and to the cross pieces 15, as by means of bolts.

Rails 21 are secured to opposite sides of the bar 19, and rails 22 are similarly secured to opposite sides of the bar 20. The rails secured to the upper bar 19 are located immediately over the rails secured to the bar 20, the facing edges of the rails being of angular shape, as plainly shown in Fig. 2 of the drawings. Blade supports 23 are also secured to the upper bar 19, these preferably lying outside of the rails 21, and secured by the same fastening means as secure the rails in position. Blades 24 are secured to the blade supports 23, the edges of these blades bearing cutting teeth 25 which are properly formed to cut a groove in a piece of metal. The lower edges of the upper rails are cut away at what I term the feeding end of the machine, as shown at 28 in Fig. 1 of the drawings, this being for the purpose of allowing a carriage to be placed in position, as hereinafter described.

A feed shaft 26 is mounted in the end pieces 13, this shaft bearing a feed screw 27. This feed shaft bears at one end a driving pulley 29 loosely mounted on the shaft. A friction disk 30 is rigidly secured to the shaft against a shoulder 31, this disk having preferably a driving fit. A friction washer 32 of leather or other suitable material is interposed between the side of the pulley 29 and the friction disk, a casing 33 inclosing the friction disk to prevent the entrance of dust or dirt to the friction surfaces. A spring 34 presses with one end against the hub of the pulley 29 and with the opposite end against a stop on the shaft, in the present instance this stop being formed by a nut 35.

A worm 36 located on the shaft meshes with a worm gear 37 on a cross shaft 38, the latter bearing a gear 39 meshing with a gear 40 on a carrier feed shaft 41. This carrier feed shaft bears a drum 42 suitably mounted on the machine, in the form shown brackets secured to the base 12 and projecting through openings in the table 10 being employed. At the opposite end of the machine a drum 43 is mounted in a similar manner, and carriers 44 pass around said drums. There are preferably two of these carriers each consisting of a flexible material, the upper portions of which pass through the chambers 17, as shown in Fig. 2 of the drawings.

Each pair of oppositely disposed rails 21 and 22 constitute a track or guide on which the carriages 45 travel and along which they are guided through the machine. Each carriage has a blank holder 46 projecting from the side part of the carriage in which projection the blank recess 47 is formed. A groove 48 extends from each of the recesses 47 to the upper surface of the blank holder 46; these grooves being of proper width to receive the edges or cutting teeth of the blades 24. Any suitable means for holding the blanks in the holders may be employed. In the form herein shown a headed blank 49 is operated upon, the head abutting against the end of the holder, serving to secure the blank in place.

The lower rails 22 terminate short of the upper rails 21, as plainly shown in Fig. 1 of the drawings, and a drop or receiver 50 is located at this point appurtenant to each of the lower rails. Each drop is pivoted as at 51 and has its inner edge forming a lip of angular shape, as shown at 52, to correspond with the shape of the edge of the lower rails. A counterbalance 53 is also secured to each drop, as plainly shown in Fig. 3 of the drawings. The web 16 does not extend underneath the drops 50, but a guide 54, located in line with the web and extending upward to a point immediately underneath the feed shaft 26, is provided. This guide is preferably constructed of wood and is secured in place in any desired manner.

In the operation of the device the carriages 45 are supplied each with a blank 49, and the lower edge of each carriage being placed upon a lower rail 22, the upper edge is swung into the recess 28, and the carriage then moved along until it engages an upper rail 21. Rack teeth 55 are formed on the inner or facing sides of the carriages, these teeth being shaped to mesh with the feed screw 27. The carriage being moved until the parts thus engage the rotation of the feed screw moves the carriage with the blank into engagement with the cutting edges 25 of the blades 24.

While I have shown herein two blades each succeeding tooth of which, toward the

delivery end of the machine, is located a trifle lower than the preceding tooth, as sufficient for a complete operation, yet in many forms of the machine a greater number of blades will be employed and the machine constructed of greater length for the purpose. In such a construction a greater number of intermediate supports 14 are provided, they, however, being duplicates of parts herein shown.

As the carriages are moved by the feed screw underneath the cutting edges or teeth 25 a proper groove is formed in the blank which is carried by the feeding screw beyond the blades and onto a drop 50. The carriage is freed from engagement with the feed screw at about the time that it is wholly deposited on the drop. Its weight at this moment is sufficient to overcome the weight of the counterpoise 53, and the drop turning on its pivot deposits the carriage onto one of the carriers 44. In this movement the upper edge of the carriage rests against the guide 54, so that it is deposited on the carrier in a predetermined position, that is, with the blank holder uppermost. The carriers traveling in the direction of the arrows shown in Fig. 1 transfers the carriages from the delivery end to the feeding end of the machine, at which point the operator removes the blank, replaces another blank and inserts the carriage in the machine as hereinbefore described. It will thus be noted that a single operative can easily care for a single machine, supplying the carriages and placing them in position and thus keep the machine running at its full capacity.

In case a carriage shall become stalled by reason of improper work of the blades the operation of the feed screw applies a force on to the feed shaft in a direction toward the feeding end of the machine. This causes said shaft to move longitudinally in that direction against the force of the spring 33, carrying with it the friction disk 30, relieving the pressure at this point. The momentum of the wheel 29 will also aid in this longitudinal movement of the shaft, turning it ahead and causing complete separation of the disk 30 and the pulley 29. The pulley can thus, when the machine is stopped by reason of the imperfect operation, spin around without injury to other parts of the device. The release of the frictional engaging means is so instantaneous that little damage will occur to the cutting blades, as the feed immediately stops.

By this construction a positive and steady feed of the blanks against the cutters is insured, the carriages being free from chatter or vibration in the cutting operation. The carriages are delivered by the carrier through openings 56 (shown in dotted lines in Fig. 1) at the end of the machine, where they may be delivered onto a table arranged for the

purpose, or may be taken by the operative directly out of the opening as they are deposited therein.

What I claim as my invention and desire to secure by Letters Patent is:—

1. A frame, a shaft mounted in the frame and having a feed screw, means for rotating the shaft, a carriage having a rack to mesh with the feed screw, means for permitting temporary placement of the carriage in the machine, means for guiding the carriage, means on the carriage for holding a blank, and a cutter secured in position to operate upon said blank.

2. A frame, a shaft mounted in the frame and having a feed screw, means for rotating the shaft, carriages each having a rack to mesh with the feed screw, means upon opposite sides of the shaft for guiding said carriages, means upon the carriages for holding a blank, and cutters secured in position at opposite sides of said shaft to operate upon blanks held in the carriages.

3. A frame, a guide cut away at one end to permit temporary placement of a carriage, the carriage fitting said guide and removably connected with a feed, means for feeding the carriage along the machine, a blank holder borne by the carriage, and a cutter supported in position to operate upon said blank in the movement of the carriage.

4. A frame, a guide mounted on the frame, a carriage fitting said guide, a blank holder borne by the carriage, means for feeding the carriage along said guide, a cutter to operate upon the blank in the holder, a drop to receive the carriage in its movement from underneath the cutters, and means for operating the drop to release the carriage from the guide.

5. A frame, a guide mounted on the frame, a carriage fitting said guide, a blank holder borne by the carriage, means for feeding the carriage along the guide, a cutter to operate upon the blank in the holder, a drop to receive said carriage, and a counterpoise device coacting with the carriage to operate the drop to release the carriage from the guide.

6. A frame, a guide mounted on the frame, a carriage fitting said guide, a blank holder borne by the carriage, means for feeding the carriage along said guide, a cutter mounted to operate upon the blank in said holder, a pivoted drop arranged to receive the carriage on one side of the pivot, and a weight at the opposite side of the pivot co-acting with the carriage to operate the drop.

7. A frame, a guide mounted on the frame, a carriage fitting said guide, a blank holder borne by the carriage, means for feeding the carriage along the guide, means for automatically releasing the carriage from the guide, and a cutter mounted to operate upon the blank in the holder.

8. A frame, a guide mounted on the frame,

a carriage removably held between members of said guide, a blank holder borne by the carriage, means for feeding the carriage along the guide, a cutter mounted to operate upon a blank in said holder, and means for releasing the carriage.

9. A frame, a guide mounted on the frame, a carriage fitting said guide, a blank holder borne by the carriage, means for moving the carriage along the guide, a cutter for operating upon a blank in the holder, a drop to receive said carriage, and means for automatically releasing the carriage from the guide.

10. A frame, a guide mounted in the frame, a carriage fitting said guide, a blank holder borne by the carriage, means for feeding the carriage along the guide, a cutter mounted to operate upon a blank in the holder, and a pivoted drop arranged to receive the carriage on one side of its pivot and having a weight at the opposite side co-acting with the carriage to release it from the guide.

11. A frame, a guide borne by the frame, a carriage fitting said guide, a blank holder in said carriage, means for feeding the carriage along the guide, a cutter mounted to operate upon a blank in said holder, a drop to receive the carriage, a guide to direct the carriage to a carrier, and means for operating the drop.

12. A frame, a guide mounted on the frame, a carriage fitting said guide, means for moving the carriage along the guide, a drop having a lip to fit said carriage, and means for operating the drop to release the carriage from its guide.

13. A frame, a guide mounted on the frame, a carriage fitting said guide, means for feeding the carriage along the guide, a pivoted drop having a lip to fit said carriage and a weight co-acting with the carriage to release it from its guide.

14. A frame, a guide mounted on the frame and including oppositely disposed rails arranged to prevent removal of a carriage while engaged therewith, the carriage fitting said guide, means for feeding the carriage along the guide, a receiver to receive the carriage from the guide, a carrier, and means for delivering the carriage from the receiver to the carrier.

15. A frame, a guide including oppositely disposed rails, one of which projects beyond the other, a receiver movably located in continuation of the shorter rail and opposite the projecting part of the other rail, means for removing the receiver, a carriage fitting said rails, and means for moving the carriage along the guides to said receiver.

16. A frame, a guide including a top and a bottom rail, the former projecting beyond the latter, a carriage fitting said guides, means for moving the carriage along the guides, a receiver located in extension of the shorter rail

and underlying the projecting part of the upper rail, and means for operating the receiver to release the carriage from the upper rail.

5 17. A frame, a guide mounted on the frame and including an upper and a lower rail, the former projecting beyond the latter, the carriage grooved to receive said rails, means for moving the carriage along the
10 rails, a drop located underneath the projecting part of the upper rail and having a lip to be received within the groove of the carriage, and means for operating the drop to lower the carriage.

15 18. A frame, a guide including oppositely disposed rails, one projecting beyond the other, a carriage having grooves fitting said rails, means for moving the carriage along the guides, a receiver located in extension of
20 the shorter rail and opposite the projecting part of the longer rail, and means for operating the receiver to move the carriage from engagement with the guide.

19. A frame, a guide including oppositely
25 disposed rails, one projecting beyond the other, and one recessed to receive the edge of a carriage, the carriage grooved to receive said rails, means for moving the carriage along the rails, a receiver located in extension of the shorter rail and opposite the projecting
30 part of the opposite rail, and means for operating the receiver to remove the carriage from engagement with the guide.

20. A frame, a guide including an upper
35 and a lower rail, the former projecting beyond the latter, a recess in one of said rails to receive the edge of a carriage, the carriage grooved to receive said rails, a drop having a lip located in extension of the lower rail and
40 formed to engage the groove in the carriage, said lip underlying the projecting part of the upper rail, and means for swinging the drop to lower the carriage.

21. A frame, a guide including an upper
45 and a lower rail, the former projecting beyond the latter, a recess in the upper rail for the reception of the edge of a carriage, the carriage having grooves fitting said rails, means for moving the carriage along the
50 guide, a drop having a lip located in extension of the lower rail and underlying the projecting part of the upper rail, means for operating the drop to lower the carriage, and means for automatically removing the carriage.
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22. A frame, a guide mounted on the frame and including a lower and an upper rail, the latter projecting beyond the former, a carriage having grooves fitting said rails, means
60 for moving the carriage along the guide rails, a counterbalanced drop having a lip located in extension of the lower rail and underlying the projecting part of the upper rail, said lip fitting a groove in the carriage, and means
65 for automatically removing the carriage.

23. A frame, a guide mounted in the frame and including upper and lower rails, the former projecting beyond the latter, a carriage having grooves fitting said rails, means for moving the carriage along the
70 guide rails, a counterbalance drop having a lip located in extension of the lower rail and underlying the projecting part of the upper rail, a guide located opposite said drop to conduct a carriage away from the drop, and
75 means underlying the drop to automatically remove the carriage.

24. A frame, a feed shaft mounted in the frame, means for operating said shaft, guides located on opposite sides of the shaft each including oppositely disposed rails one shorter
80 than the other, carriages located on opposite sides of the feed shaft and in engagement therewith and also with said guides, receivers for said carriages, and means for operating
85 the receivers to remove carriages from the guides.

25. A frame, a shaft having a feed screw mounted in the frame, means for operating the shaft, guides located one on the opposite
90 side of the shaft from the other and each including rails one projecting beyond the other, carriages for each of said guides, each carriage having grooves fitting said rails, a receiver located in extension of the shorter rail of each
95 guide to receive a carriage therefrom, and means for operating the receivers to remove carriages from the guides.

26. A frame, a shaft having a feed screw mounted in the frame, means for operating
100 the shaft, guides one located on the opposite side of the shaft from the other and each including a bottom and a top rail, the latter projecting beyond the former, carriages having grooves fitting said rails and in engagement
105 with said screw, a drop appurtenant to each guide and having a lip located in extension of the lower rail to be received within the groove of a carriage, and means for operating the drop to remove a carriage from the guide.
110

27. A frame, a shaft having a feed screw mounted in the frame, means for operating the shaft, guides located one on the opposite
115 side of the shaft from the other and each including oppositely disposed rails one projecting beyond the other, and one rail being recessed to receive the edge of a carriage, carriages mounted on opposite sides of the shaft and in engagement with said feed screw and having grooves fitting said rails, receivers
120 located in extension of the shorter rail of each guide, and means for operating the receiver to remove a carriage from the guides.

28. A frame including a base having chambers extending lengthwise therein, a drum
125 located at each end of the frame, carriers mounted on said drum and located within said chambers, guides mounted in the frame, carriages fitting each of the guides, means for moving the carriages along the guides, means
130

for operating upon work borne by the carriages, and means for releasing the carriages from the guides and delivering them to said carriers.

5 29. A frame having a base with a longitudinally extending web forming chambers, drums mounted at each end of the frame, carriers mounted on said drums and located within said chambers, guides mounted on the
10 frame, a feed shaft located between said guides, carriages fitting said guides and connected with the feed shaft, a receiver upon which the carriages are deposited, and means for operating the receivers to deposit the
15 carriages upon the carriers.

30. A frame having a base with a longitudinally extending web forming chambers, drums mounted at each end of the frame, carriers mounted upon the drums and located
20 within said chambers, a shaft having a feed screw mounted in the frame, guides located one upon the opposite side of the shaft from another, carriages fitting said guides and in engagement with said feed screw, a drop
25 adapted to receive the carriages from said guides, and means for operating the drop to deliver the carriages to said carriers.

31. A frame, a carriage having blank holding means, means for feeding the carriage
30 along said frame, cutters to operate upon a blank on the carriage, means for releasing the carriage from the feeding means, and a car-

rier to receive the carriage and return it backward along said frame.

32. A frame, a shaft mounted in the frame 35 and connected with a feed screw, the feed screw, means for rotating the shaft, guide rails, carriages located on said rails on opposite sides of the screw each carriage having a mutilated nut engaging the side of the screw, 40 and means for releasing the carriages from the screws.

33. A frame, a shaft mounted in the frame and connected with a feed screw, the feed screw, means for rotating the shaft, guides 45 located upon opposite sides of the shaft and each having oppositely disposed rails, carriages removably held between said rails and each having a mutilated nut engaging the worm upon opposite sides thereof, and means 50 for releasing the carriages from the rails.

34. A frame, a shaft mounted in the frame and connected with a feed screw, the feed screw, means for rotating the shaft, guides located on opposite sides of the shaft and 55 each having upper and lower rails, carriages removably held between said rails and each having a mutilated nut engaging the screw upon opposite sides, and means for releasing the carriages from said rails.

HARRY P. TOWNSEND.

Witnesses:

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