

No. 826,595.

PATENTED JULY 24, 1906.

F. MUELLER.
FEEDING DEVICE.

APPLICATION FILED AUG. 10, 1904.

3 SHEETS—SHEET 1.

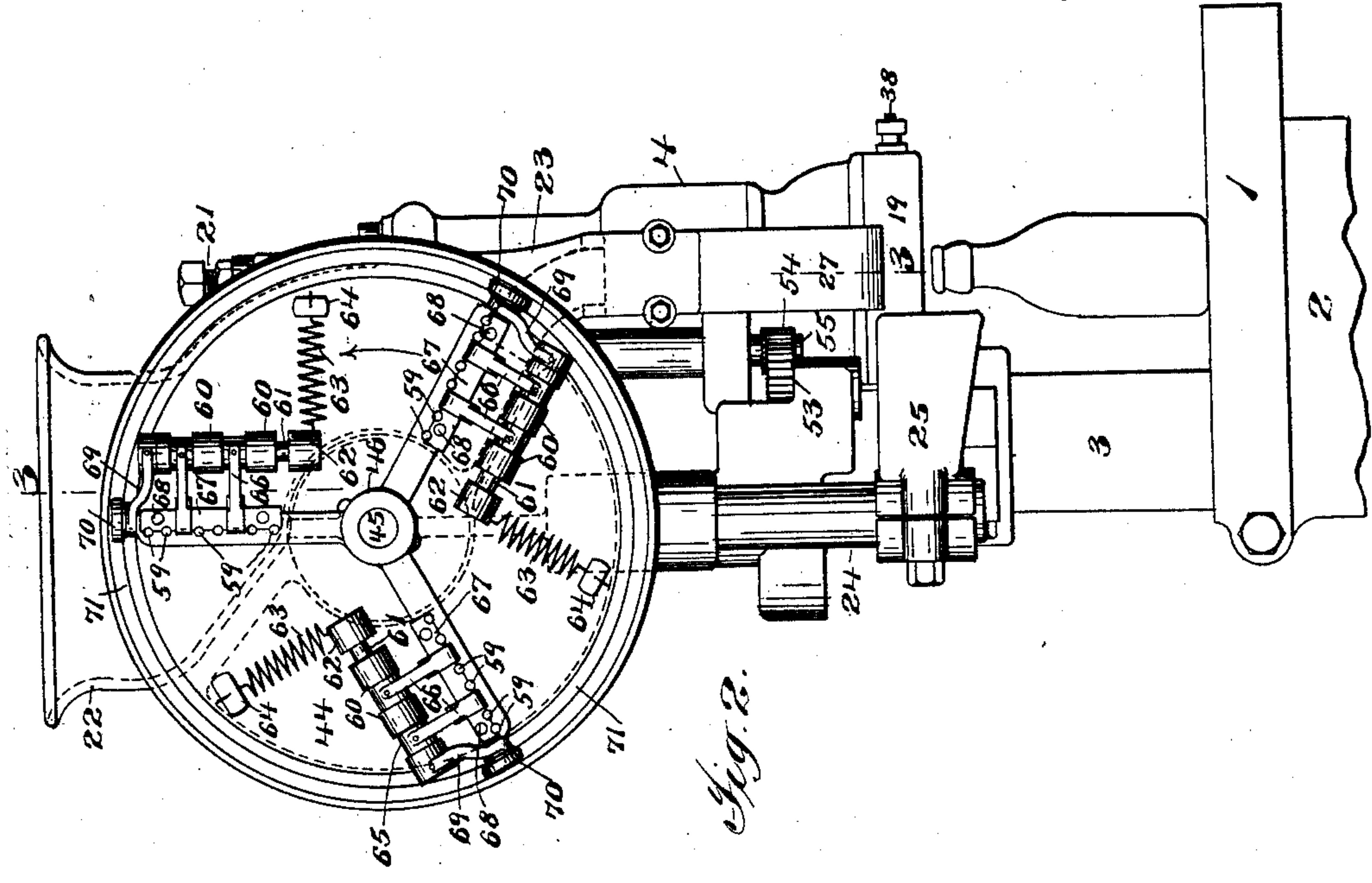


Fig. 2.

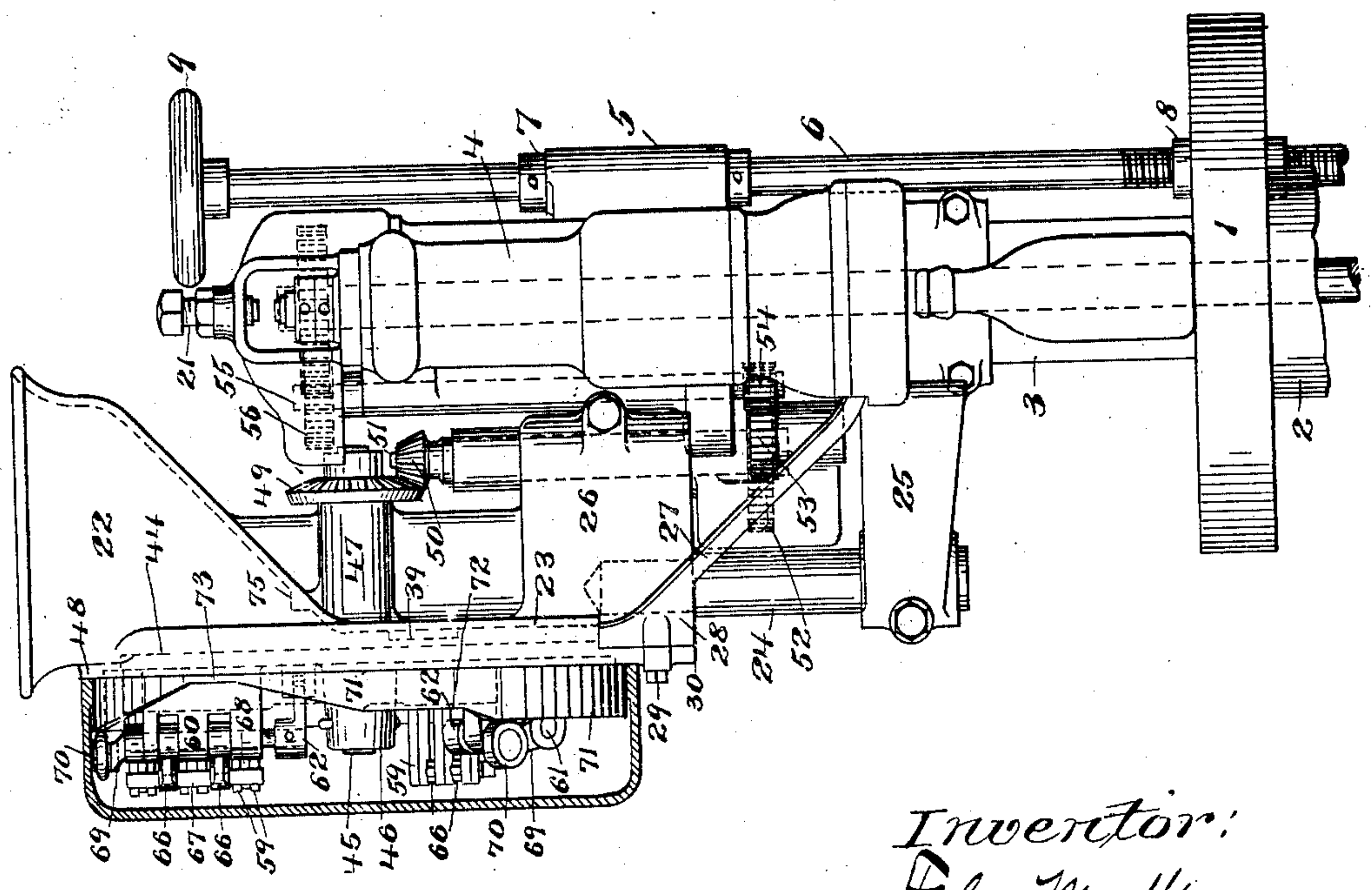


Fig. 1.

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3 SHEETS—SHEET 2.

Fig. 3.

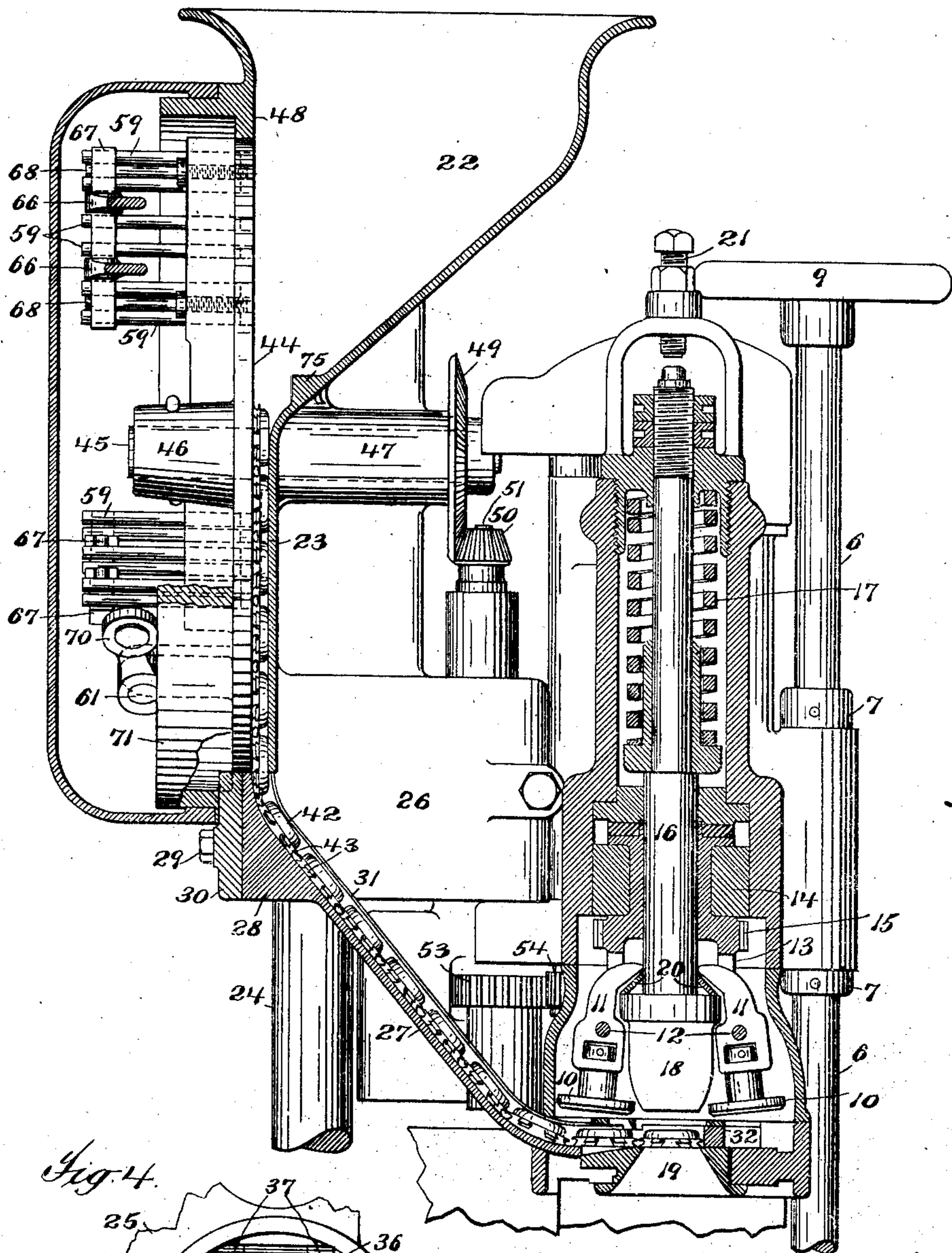
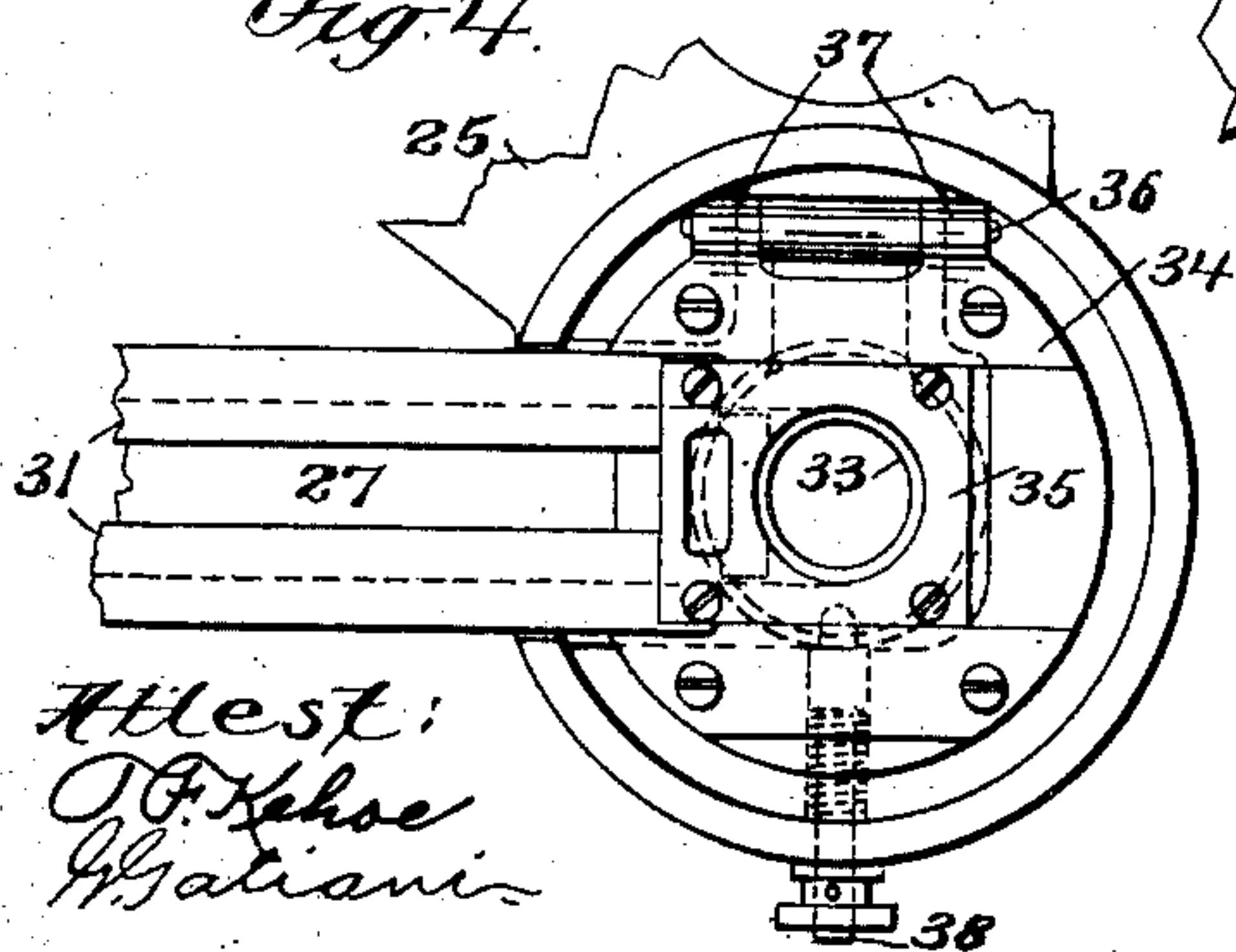
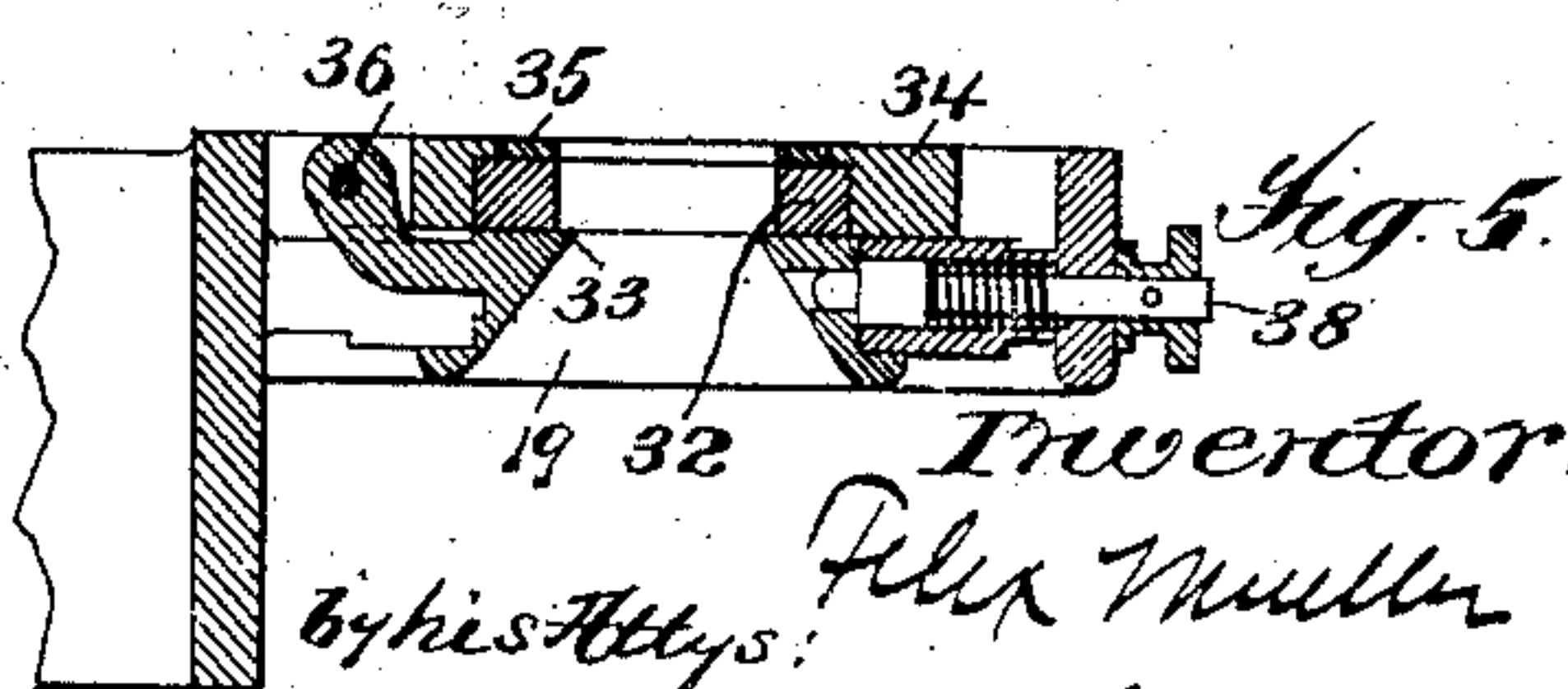


Fig. 4.



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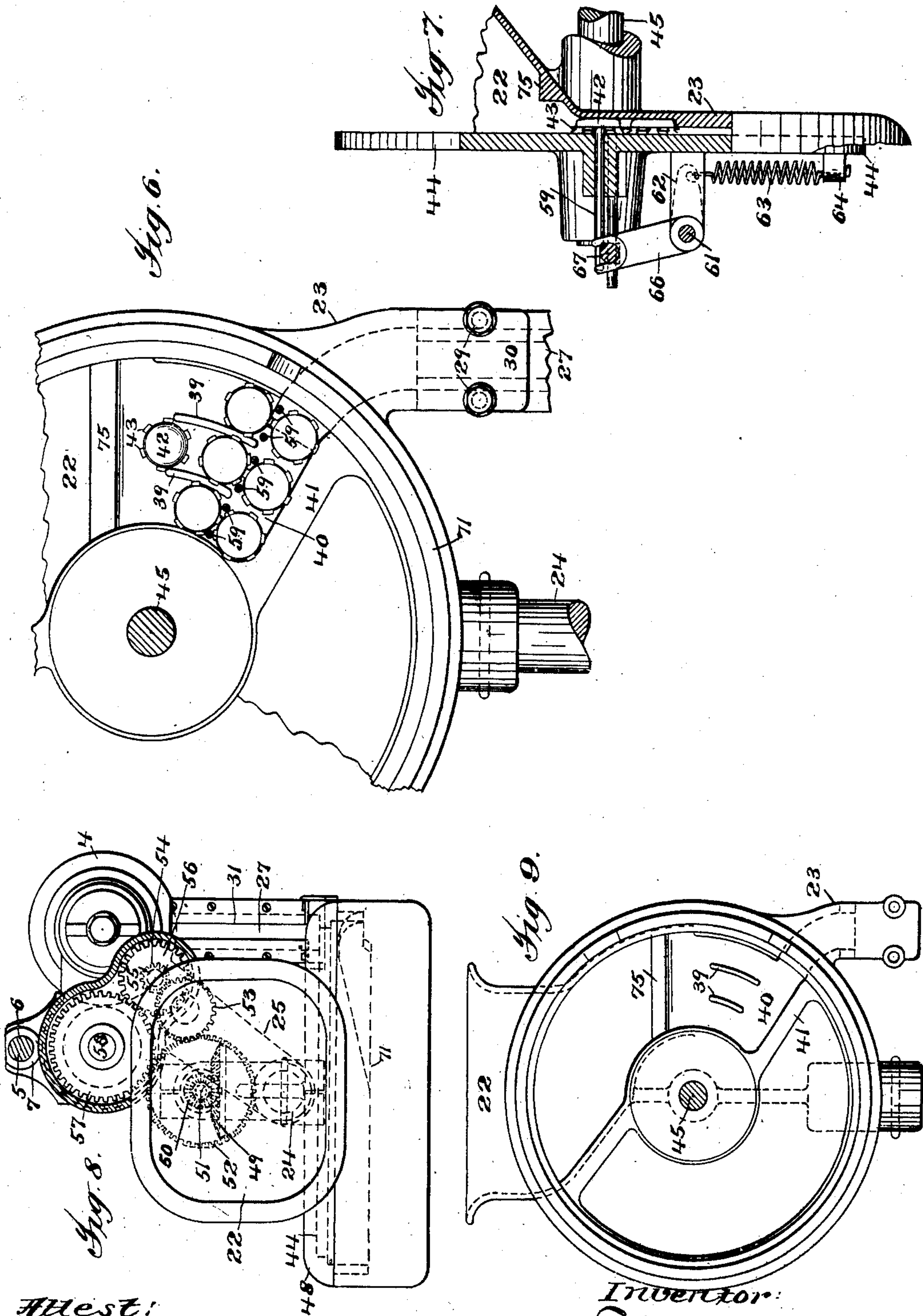
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

FELIX MUELLER, OF NEW YORK, N. Y., ASSIGNOR TO STANDARD STOPPER COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

FEEDING DEVICE.

No. 826,595.

Specification of Letters Patent.

Patented July 24, 1906.

Application filed August 10, 1904. Serial No. 220,182.

To all whom it may concern:

Be it known that I, FELIX MUELLER, a subject of the German Emperor, residing at New York, county of New York, and State of New York, have invented certain new and useful Improvements in Feeding Devices, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to improvements in feeding devices for small articles which are placed in large quantities in a receptacle—such, for instance, as a hopper—and which are fed therefrom by suitable mechanism which presents them in a predetermined position for a subsequent operation.

The invention relates more particularly to mechanism which is adapted for feeding bottle-caps and presenting them to the mechanism by which they are affixed to the bottles; but the invention is applicable to other uses.

The invention has for its object to produce a simple, cheap, and effective mechanism for feeding bottle-caps or other small articles. With this and other objects not specifically referred to in view the invention consists in certain constructions and in certain parts, improvements, and combinations, such as will be hereinafter fully described and then specifically pointed out in the claims hereunto appended.

Referring to the accompanying drawings, Figure 1 is a side elevation of a bottle-capping machine having the improved feeding device attached thereto, certain parts being shown in section. Fig. 2 is a front elevation of the construction shown in Fig. 1 with the casing which covers the cap-feeding mechanism removed. Fig. 3 is a vertical section of the construction shown in Fig. 2, the section being on an enlarged scale. Figs. 4, 5, 6, and 7 are detail views illustrating various parts of the mechanism. Fig. 8 is a plan view, partly in section, illustrating certain parts of the driving-gearing. Fig. 9 is a face view illustrating a hopper and guideway-chamber, certain parts of the mechanism being removed.

Referring to the drawings, which illustrate a preferred embodiment of the invention and which, as before stated, illustrate the invention in connection with a cap-affixing machine, 1 indicates a table or stand on which the bottles are placed, this table being mount-

ed on a standard 2. (Indicated in Figs. 1 and 2.)

The capping mechanism, when the invention is used in connection with a capping-machine, may be of any suitable type and constructed and mounted in any suitable way. As shown, there is provided a column 3, to which is secured a casing 4, said casing being provided with a boss 5, through which passes a vertical screw-shaft 6, which is connected to the boss and casing by means of a collar 7 or in any other suitable manner. The lower end of this shaft 6 is threaded into a nut 8, carried on the table, and the upper end of the shaft is provided with a hand-wheel 9, so that the entire casing and the parts carried thereby can be adjusted vertically toward and away from the table for different heights of bottle. The capping mechanism includes a plurality of spinning rolls 10, mounted on levers 11, pivoted at 12 in a rotating hub 13. This hub is recessed, and in the recess is located a bearing-collar 14, which is fast on the interior of the casing. The hub 13 is or may be provided with a gear 15, by which it is driven. Passing through this hub 13 is a vertically-movable post 16, this post being normally held at the lower end of its vertical movement by means of a stiff spring 17. The lower end of the post is provided with a head 18, against which the bottles to be capped are forced, the bottles being forced upward through a tapered throat 19 by means not shown, as they form no part of the invention. The post 16 carries a cone 20, against which the inwardly-bent ends of the levers 11 bear, the construction being such that when the bottle is forced up into position and supplied with a cap by means to be hereinafter described the spinning wheels are thrown inward and force the flange of the cap underneath a shoulder on the bottle. The upward movement of the post 16 is limited by a set-screw 21.

The cap-supplying mechanism includes a suitable reservoir or hopper 22, and in the preferred construction this hopper communicates with a chamber 23, to which it preferably delivers the articles to be fed by gravity. This hopper and chamber form parts of a casting which is supported on a vertical column 24, clamped in a bracket 25, supported on the column 3. In the construction shown

the column 24 passes into a socket in a boss 26, which also preferably forms a part of the casting referred to.

The articles are delivered to the mechanism—in the construction shown a capping mechanism—which is to subsequently operate upon them by a suitably-located chute. In the construction shown this chute communicates with the chamber 23, before referred to, at its upper end and at its lower end delivers the caps above the opening in the throat 19. This chute, as illustrated, comprises a casting 27, which forms the bottom of the chute, the upper end of the casting being formed as a block 28, which is secured, by means of bolts 29 or in any other suitable manner, to a web 30, extending from a wall of the chamber 23, before referred to. The chute 27 is preferably partly closed at its top by means of inwardly-extending side pieces 31, these side pieces being arranged to form a slot between them through which the feed through the chute can be observed. These side wings stop short of the extreme end of the chute, which terminates in a block 32, having an opening therein to admit the caps and resting on the throat 19. The opening in the block is slightly larger than the opening in the throat, so that a shoulder 33 is formed on which the caps rest, the center of the opening in the block coinciding with the center of the opening in the throat. The block 32 is held in position by means of guides 34, which prevent any sidewise shift of the block. A cover-plate 35 is provided for the block, this cover-plate having a central opening therein which is large enough to permit the stoppers to be carried upward therethrough by the bottle as it moves up against the head 18.

In the preferred construction the throat will be hinged, as shown, (see Figs. 4 and 5,) so that it can be swung downward when desired, the pintle of the hinge being marked 36 and the ears 37 being formed on one of the guides 34. The throat is held in its operative position by means of a spring-pin 38 or in any other suitable manner.

The caps or other articles to be fed are thrown into the hopper in a heterogeneous mass and must be presented by the chute to the guiding mechanism in proper position to be applied to the bottles. Means are therefore necessarily provided by which the stoppers are delivered to the chute in proper position. In the preferred construction these means will include a guideway, and when a chamber interior the chute and the hopper is employed the guideway will be located in this chamber. The guideway may be formed in any suitable manner and may be such as to forward either a single row or a plurality of rows of caps. In the preferred construction a plurality of rows will be forwarded by the guideway, and the guideway will be formed

by ribs 39, projecting from the back plate of the chamber 23. In the construction illustrated two ribs 39 are employed, these two ribs forming a guideway consisting of three channels. These channels deliver into an inclined channel 40, down which the stoppers roll into the chute, the bottom of this channel 40 being formed by a rib 41, cast on the back wall of the chamber 23.

The caps which the mechanism selected to illustrate the invention is constructed to feed consist of a flange-cap portion 42, from which extend outwardly-bent legs 43, (see Fig. 6,) so that a diameter measured through the outwardly-bent depending legs of the cap is greater than a diameter measured through the top of the cap, and the ribs 39 are so spaced as to permit the caps to pass into the guideway when their tops are toward the back of the chamber 23; but should they be turned over the legs 43 will catch on the ribs, thus preventing the caps from entering the guideway, the operation being clearly apparent from Fig. 6.

As the caps are dumped into the hopper in a heterogeneous mass it is apparent that some of them will fall from the hopper into the chamber with their top portions facing away from instead of toward the back of the chamber, and that these caps will be caught, as before indicated, by the ends of the ribs, and thus prevented from entering the guideway. Means must therefore be provided to remove the caps or other articles to be fed from the guideway when they are presented thereto in a position other than the predetermined position in which the guideway is constructed to receive them. While these means may be widely varied in construction, they will preferably consist of lifters which may be constructed, mounted, and operated in any desired manner. In the preferred construction, and as shown, there is employed a movable plate 44, which is preferably a rotating plate, this plate being mounted on a shaft 45, passing through a boss or bearing 46, cast on the plate, and being further supported in a bearing 47, which forms a part of the casting, before referred to, by which the hopper and chamber are formed. This plate 44 fits into a circular opening in a circular rim 48, formed on the casting, this circular opening including the delivery-mouth of the hopper and the chamber in which the guideway is formed, so that the rotating plate 44 forms a side of the chamber and the hopper.

The plate 44 is preferably given a continuous rotary movement, which may be effected by any suitable or desired construction. As shown, the shaft 45 is provided with a bevel-gear 49, which meshes with a bevel-gear 50, mounted on a shaft 51, supported in a bearing in the boss 26. The lower end of this shaft is provided with a gear-wheel 52, this wheel meshing with an intermediate 53,

driven by a pinion 54, mounted on a vertical shaft 55, located in the casing 4. This shaft 55 extends upward nearly to the top of the casing 4 and is provided with a gear 56, which meshes with a gear 57, mounted on a vertical shaft 58, which is driven by gearing (not shown) from the main shaft of the machine.

The lifter mechanism, while it may be variously constructed, preferably consists of sets of pins 59, which pins are also preferably arranged in pairs and work through perforations in the plate 44. While these pins may be mounted and operated in any desired manner, in the construction shown the plate 44 is provided with bearings 60, the number of these bearings varying according to the number of sets of lifter-pins employed. In these bearings 60 are mounted rock-shafts 61, provided at one end with arms 62, to which are secured springs 63, the other end of the springs being secured to the plate in any suitable manner, as by loops 64. Mounted on the rock-shafts 61 are hubs 65, from which extend arms 66, these arms being forked at their outer end (see Fig. 7) and taking over rounded parts on bars 67, in which the pins 59 are secured. Stationary guide-pins 68 are provided, which insure straight-line movement of the bars. It is apparent that as the shafts 61 are rocked the bars 67 will move toward and away from the back of the plate and the pins 59 be protruded and withdrawn. The movement of the rock-shafts may be effected in any suitable manner. As shown, the shafts are provided with arms 69, these arms being provided with cam-rolls 70, which run on a circular cam 71, surrounding the rim in which the plate is located.

In the preferred construction the pins 59 will serve not only to remove from the mouth of the guideway any caps which may be in the wrong position with respect thereto, but will serve also to a certain extent to agitate the caps in the hopper. The cam 71 is therefore preferably provided with two steps 72 and 73, the first of which, 72, permits the pins under the influence of the springs 63 to move inward far enough to engage the caps in the chamber, and the second of which, 73, permits the pins to have a further inward movement, so as to stir the caps which lie close to the delivery-mouth of the hopper.

When the mechanism is employed for feeding caps, the lower edge of which is of irregular outline, as is the case with the caps illustrated, it may happen that the caps in the vertical part of the guideway will lock the caps in the channel 40 and prevent them from rolling down into the chute. When the mechanism is employed for feeding caps of this character, therefore, the inward movement by which the pins are caused to engage

the caps in the chamber is timed so that the pins engage the caps in the guideway above those in the channel 40. The pins therefore clear the guideway of all the caps except those in the lower horizontal row. After the pins have passed other caps are presented to the guideway, being forced down by gravity, and if they are in proper position to pass the guideway they will drop through into the lower channel 40. The movement produced by the lower step 73 of the cam 71 is timed to take place soon after the pins sweep out of the chamber 23, thus agitating the caps in and near the delivery-mouth of the hopper.

In order to effect the gravity feed into the chamber, the hopper is preferably provided with a slanting bottom, as shown, and in order to prevent any choke in the mouth of the chamber means are preferably provided to control this gravity feed. While these means may be varied in construction, a simple and effective means is produced by providing the slanting bottom of the hopper with a shoulder 75, which serves to sustain in part the weight of the mass of caps, and thus prevents the caps from feeding downward so rapidly as to choke the delivery-mouth of the hopper.

Changes and variations may be made in the construction by which the invention is carried into effect, and while the invention is particularly useful in connection with mechanism for applying caps to bottles it may, as before indicated, be used in other relations. The invention is not, therefore, to be limited to the specific details of construction hereinbefore described, and illustrated in the accompanying drawings, or to the specific use described.

What is claimed is—

1. In a feeding device, the combination with a hopper, of a delivery-chute, a chamber between the hopper and the delivery-chute, the hopper being arranged with respect to the chamber so that the articles pass thereinto by gravity, a guideway in the chamber formed to receive a plurality of rows of articles, the articles being in a predetermined position, and means by which articles presented to the guideway in other than the predetermined position are removed, substantially as described.

2. In a feeding device, the combination with a hopper, of a delivery-chute, a chamber communicating with the hopper and the chute, the hopper and chute being arranged with respect to the chamber so that the articles are delivered from the hopper into the chamber by gravity and from the chamber into the chute by gravity, a guideway in the chamber formed to receive a plurality of rows of articles, the articles being in a predetermined position, and means by which articles presented to the guideway in other than the

predetermined position are removed, substantially as described.

3. In a feeding device, the combination with a hopper, of a delivery-chute, a guideway between the hopper and the chute through which the articles can pass only in a predetermined position, and means by which articles presented to the guideway in other than the predetermined position are removed, said means also serving to agitate the articles and facilitate their feeding, substantially as described.

4. In a feeding device, the combination with a hopper, of a delivery-chute, a chamber communicating with the hopper and the chute, the hopper and chute being arranged with respect to the chamber so that the articles are delivered from the hopper into the chamber by gravity and from the chamber into the chute by gravity, a guideway in the chamber constructed to permit the articles to enter it only in a predetermined position, and means by which articles presented to the guideway in other than the predetermined position are removed, said means also serving to agitate the articles and facilitate their feeding, substantially as described.

5. In a feeding device, the combination with a hopper, of a delivery-chute, a chamber between the hopper and the delivery-chute, the hopper being arranged with respect to the chamber so that the articles pass therein by gravity, a guideway in the chamber formed to receive a plurality of rows of articles, the articles being in a predetermined position, and means by which articles presented to the guideway in other than the predetermined position are removed, said means also serving to agitate the articles and facilitate their feeding, substantially as described.

6. In a feeding device, the combination with a hopper, of a delivery-chute, a chamber communicating with the hopper and the chute, the hopper and chute being arranged with respect to the chamber so that the articles are delivered from the hopper into the chamber by gravity and from the chamber into the chute by gravity, a guideway in the chamber formed to receive a plurality of rows of articles, the articles being in a predetermined position, and means by which articles presented to the guideway in other than the predetermined position are removed, said means also serving to agitate the articles and facilitate their feeding, substantially as described.

7. In a feeding device, the combination with a hopper, of a chamber into which the hopper delivers by gravity, a guideway in the chamber, the guideway being constructed to receive the articles in a predetermined position, a chute into which the chamber delivers, a lifter operating to remove from the

mouth of the guideway articles presented thereto in other than the predetermined position, and means for moving the lifter into and out of operative position, substantially as described.

8. In a feeding device, the combination with a hopper, of a chamber into which the hopper delivers, a chute leading from the chamber, a movable plate forming one side of the hopper and chamber, a guideway constructed to receive articles only in a predetermined position, a lifter carried by the plate and operating to remove from the mouth of the guideway articles presented thereto in other than the predetermined position, and means for moving the lifter into and out of operative position, substantially as described.

9. In a feeding device, the combination with a hopper, of a chamber into which the hopper delivers, a chute leading from the chamber, a guideway constructed to receive a plurality of articles in a predetermined position, a movable plate forming a side of the chamber and hopper, and a plurality of groups of pins operating to remove from the mouth of the guideway articles presented thereto in other than the predetermined position, substantially as described.

10. In a feeding device, the combination with a hopper, of a chamber into which the hopper delivers, a chute leading from the chamber, a guideway constructed to receive a plurality of articles in a predetermined position, a movable plate forming a side of the chamber and hopper, a plurality of groups of pins operating to remove from the mouth of the guideway articles presented thereto in other than the predetermined position, and means for moving the pins into and out of operative position, substantially as described.

11. In a feeding device, the combination with a hopper, of a chamber into which the hopper delivers, a chute leading from the chamber, a guideway constructed to receive a plurality of articles in a predetermined position, a movable plate forming a side of the chamber and hopper, a plurality of sets of pins, each set comprising a plurality of groups, operating to remove from the mouth of the guideway articles presented thereto in other than the predetermined position, and means for moving the pins into and out of operative position, substantially as described.

12. In a feeding device, the combination with a hopper, of a chamber into which the hopper delivers, one wall of the chamber being ribbed, whereby a guideway adapted to receive a plurality of rows of articles is formed, a chute communicating with the chamber, a rotating plate forming one wall of the chamber and hopper, a plurality of sets of lifter-pins operating to remove from the mouth of

the guideway articles presented thereto in other than the predetermined position and to agitate the articles in the hopper, and means for operating the pins, substantially as described.

13. In a feeding device, the combination with a hopper, of a chamber into which the hopper delivers, one wall of the chamber being ribbed, whereby a guideway adapted to receive a plurality of rows of articles is formed, a chute communicating with the chamber, a rotating plate forming one wall of the chamber and hopper, a plurality of rock-shafts mounted on the plate, a plurality of sets of lifter-pins operated by the rock-shafts, and a cam for operating the pins, substantially as described.

14. In a feeding device, the combination with a hopper having a slanting bottom, of a chamber to which the hopper delivers by gravity, means whereby articles are forwarded through the chamber in a predetermined position only, a chute connecting with the chamber, and means in the hopper for controlling the feed of the articles into the chamber, substantially as described.

15. In a feeding device, the combination with a hopper having a slanting bottom, of a chamber to which the hopper delivers by gravity, means whereby the articles are forwarded through the chamber in a predetermined position, a chute connecting with the chamber, and a shoulder in the hopper serving to partly sustain the mass of articles therein and thus control the feed, substantially as described.

16. In a feeding device, the combination with a hopper having a slanting bottom, of a chamber to which the hopper delivers by gravity, means whereby the articles may be forwarded through the chamber in a predetermined position, means for removing the articles which are presented in other than the predetermined position, a chute connected to the chamber, and a shoulder in the hopper serving to partly sustain the mass of articles therein, substantially as described.

17. In a feeding device, the combination with a hopper having a slanting bottom, of a chamber to which the hopper delivers by gravity, a guideway in the chamber constructed to receive the articles in a predetermined position only, means for removing from the guideway articles presented in other than the predetermined position, a chute connected to the chamber, and a shoulder in the hopper

serving to partly sustain the mass of articles therein, substantially as described.

18. In a feeding device, the combination with a hopper having a slanting bottom, of a chamber to which the hopper delivers by gravity, a guideway in the chamber constructed to receive the articles in a predetermined position only, means for removing from the guideway articles presented in other than the predetermined position, a chute connected to the chamber, a shoulder in the hopper serving to partly sustain the mass of articles therein, and means for agitating the articles near the delivery-opening of the hopper, substantially as described.

19. In a feeding device, the combination with a hopper having a slanting bottom, of a chamber to which the hopper delivers by gravity, means whereby the articles may be forwarded through the chamber in a predetermined position, a chute connected to the chamber, a shoulder on the slanting bottom of the hopper serving to partly sustain the mass of articles therein, and means for agitating the articles near the delivery-opening of the hopper, substantially as described.

20. In a feeding device, the combination with a hopper having a slanting bottom, of a chamber to which the hopper delivers by gravity, a guideway adapted to receive the articles in a predetermined position only, a chute connected with the chamber, a shoulder on the slanting bottom of the hopper, and means for agitating the articles near the delivery-opening of the hopper, said means also serving to remove from the guideway any articles presented thereto in other than the predetermined position, substantially as described.

21. In a feeding device, the combination with a hopper having a slanting bottom, of a chamber to which the hopper delivers by gravity, means whereby articles are forwarded through the chamber in a predetermined position only, a chute connecting with the chamber, and means in the hopper for controlling the feed of the articles in the chamber, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

FELIX MUELLER.

Witnesses:

E. R. HARTY,
GEORGE W. GWINN.