

No. 867,288.

PATENTED OCT. 1, 1907.

F. MUELLER.
FEEDING DEVICE.

APPLICATION FILED AUG. 10, 1904.

3 SHEETS—SHEET 1.

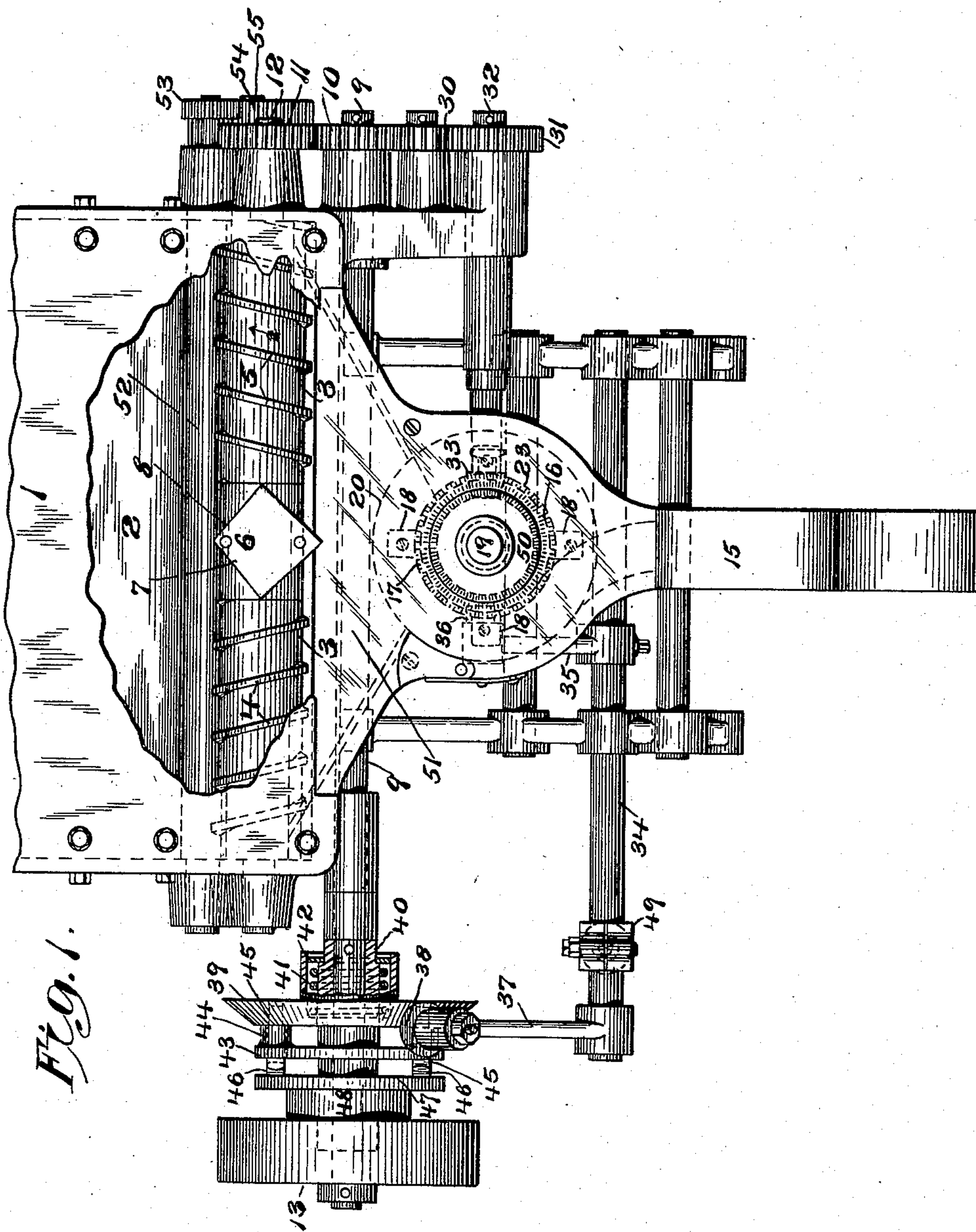


Fig. 1.

Witnesses
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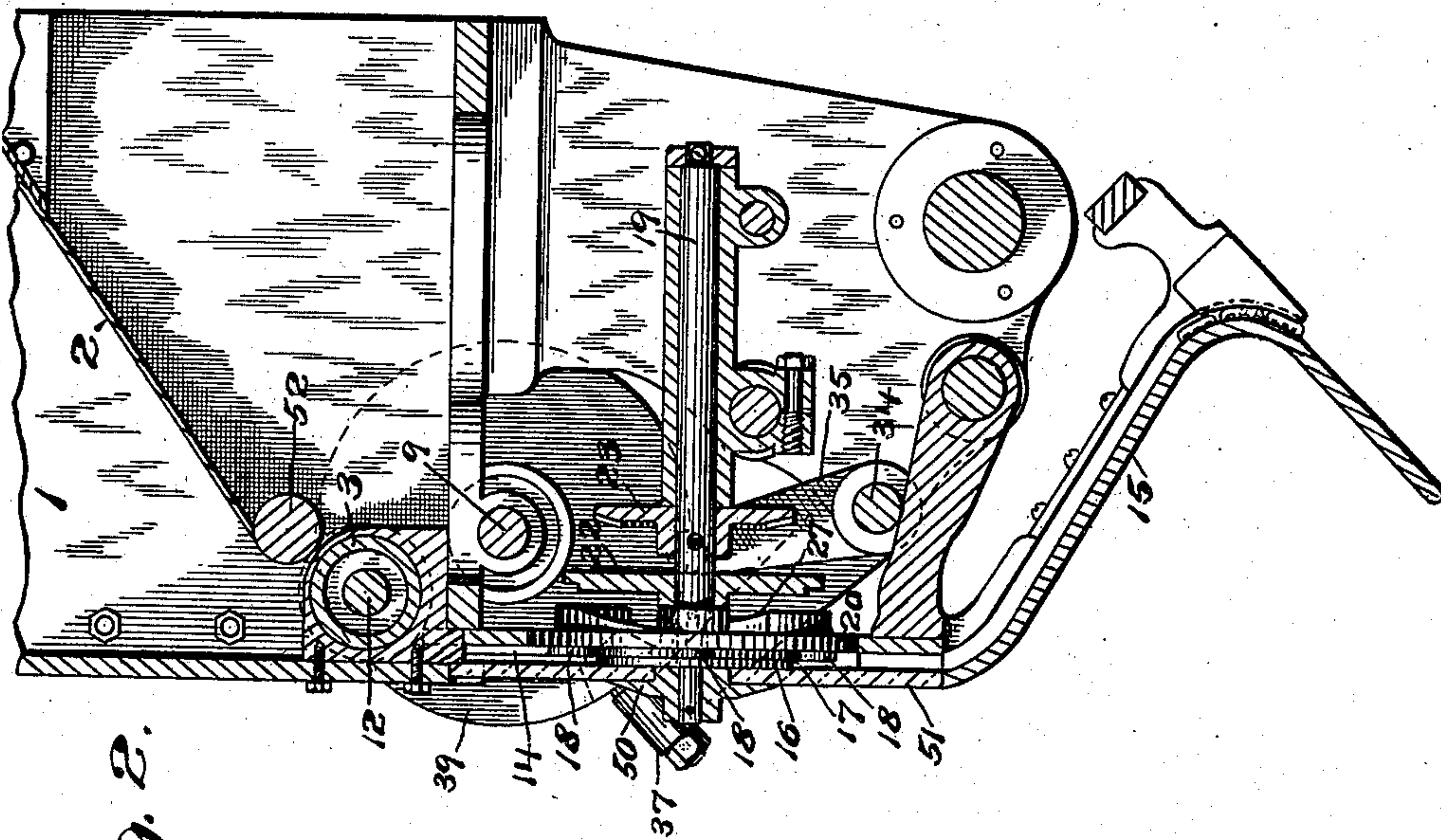


Fig. 2.

Witnesses
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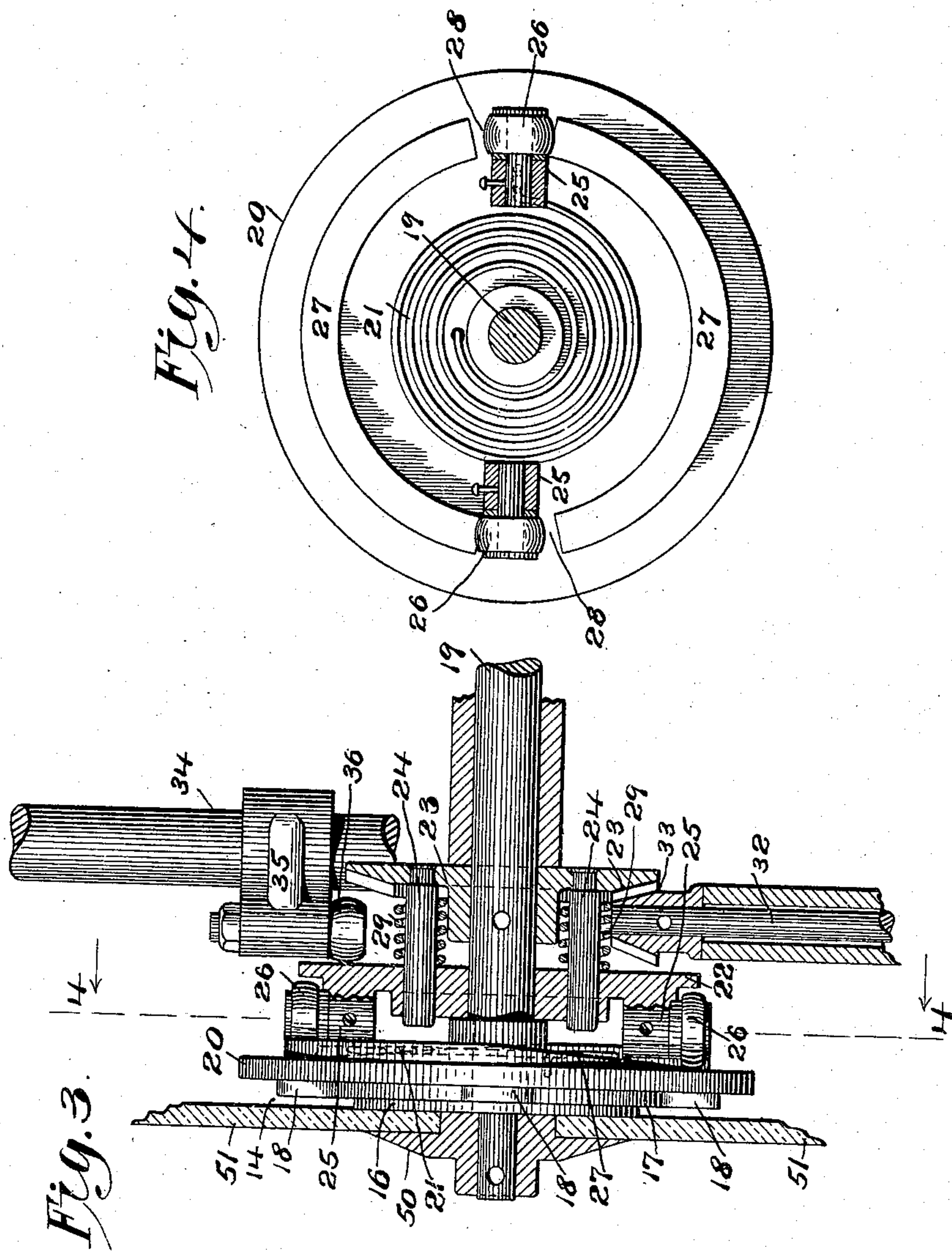
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3 SHEETS—SHEET 3.



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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. 867,288.

Specification of Letters Patent.

Patented Oct. 1, 1907.

Application filed August 10, 1904. Serial No. 220,181.

To all whom it may concern:

Be it known that I, FELIX MUELLER, a subject of the Emperor of Germany, residing at New York, county of New York, and State of New York, have invented
5 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 certain improvements in
10 that class of feeding mechanisms which operate upon articles in a body or mass, such of the articles as are presented to the mechanism in a given position being passed thereby and the remainder being again presented to the mechanism.

15 This invention has for one of its objects to produce a simple, cheap and effective mechanism by which the separation and feeding of articles in a given position from a mass may be readily and economically effected.

A further object of the invention is to produce a
20 mechanism embodying suitable selector and delivery devices, the operation of the selector being automatically stopped when the articles are being fed more rapidly to the delivery than they are being delivered therefrom, so as to prevent choke and breakage.

25 With these and other objects in view, the invention consists in certain constructions and in certain parts, improvements and combinations as will be hereinafter fully described and then specifically pointed out in the claims hereunto appended.

30 Referring to the drawings, Figure 1 is a front elevation of the selector mechanism and its driving means, certain parts being broken away to clearly show the construction. Fig. 2 is a central vertical section of the
35 construction shown in Fig. 1. Fig. 3 is a detail view illustrating part of the stopping mechanism. Fig. 4 is a section on the line 4—4 of Fig. 3.

The mechanism illustrated in the drawings which constitute a preferred embodiment of the invention, is particularly adapted for feeding bottle caps from a
40 hopper or other source of supply, the caps being fed into a delivery channel or chute in a certain predetermined position. It is to be understood, however, that the invention may be embodied in mechanism adapted to operate upon other articles than bottle caps.

45 The bottle caps to be operated upon may be presented to the selector proper by any suitable mechanism of device. In the construction shown, the presenting means consists of a hopper 1 having an inclined bottom 2 down which the caps readily slide. In the operation
50 of the mechanism, a supply of caps is placed in the hopper and the caps pass from the hopper to the selector.

The selector may be widely varied in its operation. In its preferred form, it consists of a cylinder 3 exteriorly
55 channeled. The channeling of the exterior of

the cylinder may be produced in any suitable way, as, for instance, by a rib or ribs on its exterior. In the preferred form of the construction, furthermore, the cylinder, when a cylinder is employed, will be spirally
60 channeled for reasons which will hereinafter appear. While, furthermore, the spiral channels may be run in the same direction around the cylinder, in the preferred construction a plurality of spiral channels will be employed which are oppositely arranged. In the
65 construction shown, the cylinder 3 is provided with ribs 4 and 5, the ribs 4 being oppositely arranged with respect to the ribs 5. These ribs, in fact, are analogous to the threads of a screw and the cylinder 3 may thus be said to be provided with threads running in
70 opposite directions. The bottle caps which are to be operated upon by the selector mechanism are generally circular in outline, and the diameter across their tops or crowns is less than the diameter through the
75 flanges. The channels formed by these ribs are of such a width that when the caps are presented thereto with the crowns toward the cylinder, these crowns will drop into the channels, the flanges of the caps extending above the channels. When, however, the caps
80 are presented to the channels with the bottoms of their flanges toward the cylinder, they will not enter the channels, but their flanges on one or both sides will rest on the ribs.

The cylinder is so disposed with respect to the front wall of the hopper 1 that a sufficient space is left between the channel or channels of the selector cylinder
85 and the wall so that the caps which have fallen into the channels with their crowns toward the cylinder will, in the construction illustrated, drop by gravity into the delivery chute hereinafter described.

Notwithstanding the fact that the channels are not
90 of sufficient dimensions to admit a cap when presented to the selector cylinder with the bottom of its flange toward the cylinder, it sometimes happens that caps will fall with their pendent flanges toward the cylinder
95 and with some portion of their pendent flanges bearing against a side of the ribs 4, 5. When this occurs, the ribs act as threads of a screw, as before stated, and advance the cap along the cylinder as the cylinder rotates. In the preferred construction, means are provided for removing from the channels of the cylinder
100 the caps which have been caught thereby in an improper position and forwarded. This removing means may be widely varied in construction and will vary according to the construction and arrangement of the rotating selector. In the construction shown, and
105 wherever a cylinder having oppositely arranged spiral channels is employed, the removing means will preferably be located between the channels of the cylinder. In the preferred construction and as shown, the cap removing means will preferably consist of an in- 110

clined guide for each channel. While this guide may be formed in any suitable manner, as shown, it is formed by a block 6 having inclined guide faces 7 and 8, the inclined guide face 7 cooperating with the channel formed by the ribs 4 and the guide face 8 cooperating with the channel formed by the ribs 5.

The operation of the means for removing from the channels of the cylinders the caps which have been improperly caught and are being forwarded thereby is as follows:—If a cap is caught by the thread 4 with, for instance, its base toward the cylinder, it will be forwarded by the thread. The space between the front wall of the hopper 1 and the cylinder is not, however, sufficiently great so as to permit a cap thus forwarded to drop by gravity into the delivery chute. The improperly positioned cap will, therefore, be pushed ahead until it strikes the inclined guide face 7. The screw will, however, continue to forward it and the pushing action of the screw will cause the cap to ride up the inclined face toward the top of the cylinder. As the next improperly positioned cap comes along it will be acted upon in the same way and push the first cap up into the mass of caps in the hopper. This cap removing device located as it is between the two channels, allows the caps to be fed forward from the sides of the hopper toward the center and thus prevents the caps from being banked up at one end of the hopper.

The selector cylinder may be driven in any suitable manner. As shown, there is provided a shaft 9 located in suitable bearings in the frame of the mechanism, this shaft being provided on its end with a gear wheel 10, said gear wheel meshing with a gear 11 on a shaft 12 on which the selector cylinder is mounted. The shaft 9 may be driven in any suitable manner, a belt pulley 13 being shown for this purpose and in the preferred construction, a suitable clutch mechanism will be introduced between the belt pulley and the shaft, as will be hereinafter described.

After passing the selector mechanism, the caps or other articles to be operated upon, will, in the preferred construction, drop into a suitable delivery. This delivery will, of course, be varied widely in construction according to the character and construction of the machine with which the feeding mechanism is used. In the construction shown, there is provided a chamber 14 which is of sufficient width to receive the caps in edgewise position and maintain them therein. This chamber terminates, in the construction shown, in a suitable chute 15 down which the caps move to be presented to any suitable cap applying mechanism. While the caps might pass from the chamber into the chute by gravity, in order to prevent clogging and to insure certainty of delivery, there is preferably provided a forwarding device which positively transfers the caps from the chamber to the chute. The construction of this forwarding device may be widely varied. In the construction shown, two disks 16, 17 are provided, the disk 17 being of slightly greater diameter than the disk 16. As the caps pass through the chamber 14 they are faced towards the front of the chamber, so that the crown of the caps rest upon and are supported by the periphery of the disk 17, and the flanges rest upon and are supported by the periphery of the disk 16. One of the disks, in the construction

shown, the disk 17, is provided with a plurality of projections 18, there being in the construction illustrated four of these projections. The disks are mounted on a shaft 19 and are rotated thereby through mechanism which will be hereinafter described. As the disks rotate, the caps fall into the spaces between the projections 18, and are positively forwarded by these projections and delivered into the chute 15.

In the preferred construction there is provided a means by which the movement of the selector, and preferably also of the forwarding device, may be interrupted when the chute 15 is full, so as to prevent breakage therein of caps or the mechanism. The mechanism by which this interruption of the movement of the selector and forwarding device is effected may be varied widely in its construction. As shown, the disks 16 and 17 are carried on a disk 20 which is loosely mounted on the shaft 19. This disk 20 is connected by a coiled spring 21, one end of the spring being fast to a disk 20 and the other end being fast to one of two bearings 25 secured to a disk 22. The disk 22 is in turn secured to a gear wheel 23 fast on the shaft 19 by means of pins 24, said pins passing through openings in the disk 22. The disk 22 has secured to it the bearings 25 before referred to in which are mounted rolls 26. The disk 20 is provided with cam segments 27, there being spaces 28 between the ends of these segments. The disk 22 is held forward by springs 29 so that the rolls bear firmly against the face of the disk when they are opposite the spaces between the segments and at other times against the cam segments.

It may be here stated that the shaft 19 is driven from the main shaft 9 by means of an intermediate gear 30 which meshes with a gear 31 on the end of a shaft 32, this shaft being provided with a beveled gear 33 which meshes with the gear wheel 23. It is obvious, however, that different driving means might be employed.

It will be readily understood that the construction hereinbefore described by which the disks 20 and 22 are mounted allows the disks to separate whenever the rotation of the disk 20 which, it will be remembered, is fast to the disk 17, is checked, which will happen whenever the chute 15 is full of caps. In other words, whenever the chute 15 is so filled with caps that the caps in front of one of the projections 18 cannot be readily forced by the projection into the chute, the spring 21 will yield. As soon as the spring begins to yield, since the rotation of the disk 22 continues, the rolls 26 will run up onto the cam segments 27 and force the disk 22 back against its springs 29. It is this movement of the disk 22 which is utilized to stop the cap feeding mechanism, and this particular mechanism forms an efficient means for this purpose, although it is to be understood that other mechanism might be used for this purpose, if desired. The particular means by which this movement of the disk 22, or any substitute therefor, operates to stop the operation of the cap feeding mechanism may be varied within wide limits. In the construction shown, there is provided a shaft 34 suitably supported in the frame, which shaft is provided with an arm carrying a bowl 36 which, when the mechanism is in operation, lies behind the disk 22 and close thereto. This shaft is provided with another arm carrying a beveled roller 38 which lies in front of a spring pressed beveled disk 39, said disk being loose on a hub 40 which

is in turn fast on the shaft 9. The spring by which the disk 39 is pressed forward is indicated at 41, the spring being contained in a suitable housing 42. Fast on the hub 40 is a plate 43, this plate having a pair of hollow bosses 44 which extend toward the disk 39. The disk 39 carries two pins 45 which extend through the bosses 44 and when the disk 39 is in its forward position, they are engaged by two pins 46 carried by a plate 47 on a hub 48. This hub is loose on the shaft and is the hub which carries the belt pulley 13 before referred to. The shaft 34 is or may be provided with a counterweight which is secured to a collar 49 fast on the shaft 34, this counterweight being located back of the shaft as the construction appears in Fig. 1. This counterweight tends to rock the shaft in such a way as to carry the arm 37 and its roll 38 toward the disk 39, but it is not heavy enough to overcome the force of the spring 41 and so disconnect the parts of the clutch. When, however, the chute 15 is so filled with caps that no more can be forced in by the arms 18 on the disk 17, the disk 22 moves back in the manner before described, rocks the shaft 34, and through the arm 37 and the roll 38 moves back the disk 39, thus pulling the pins 45 out of engagement with the pins 46 and disconnecting the clutch.

When the chute has been emptied sufficiently so as to permit the feeding of more caps thereto, the disk 20 and the connected disk 17 will, under the influence of the spring 21, move forward, thus causing the cam segments 27 to move out from under the rolls and permitting the rolls to drop into the spaces 28. When this occurs, the disk 22 will move forward and by a reverse movement of the mechanism described will permit the parts of the clutch to become engaged and the rotation of the shaft 9 will be resumed. Inasmuch as the shaft 9 is the prime mover not only for the advancing mechanism for the caps but also for the selector cylinder, it will be understood that when the rotation of this shaft stops, the entire mechanism comes to a standstill.

In the construction shown, the shaft 19 carries on its end a recessed stop collar 50 which prevents the disks 16, 17 from moving too far forward. This collar turns loosely in an aperture in the front plate 51 of the delivery mechanism, which plate is made preferably of transparent material, so that the movement of the advancing mechanism may be readily observed.

In the construction shown, the selector cylinder rotates in the direction of the arrow placed thereon in Fig. 1, and the tendency of the cylinder is to carry the caps backward or away from the front plate of the hopper. With certain kinds of caps, there might be a tendency to jam by reason of the fact that certain parts of the caps may enter between the spaces necessarily left for the passage of the ribs in the rear wall of the hopper. To prevent this, the rear wall of the hopper is, in the preferred construction made movable. While this may be effected in any suitable manner, in the construction shown, the lower part of the rear wall of the hopper below the plate 2 is formed by a cylinder 52, the shaft of the said cylinder being provided with a gear 53 which meshes with a broad faced gear 54 mounted on a stud 55 extending from the frame of the machine. This broad faced gear 54 is in mesh with the gear 11 before referred to on the shaft 11 of the selector cylinder. This cylinder forms, therefore, a movable wall for the hopper and prevents any caps

from being forced in between the two cylinders and thus be crushed.

Changes and variations may be made in the mechanism by which the invention is carried into effect. It is to be understood, therefore, that the mechanism shown in the drawings while it illustrates a preferred form of the construction is only one specific embodiment of the invention and that the invention is not restricted to the details thereof.

What is claimed is:—

1. In a feeding device, the combination with an exteriorly channeled rotating selector, of means for presenting articles thereto, and means for removing from the selector the articles not passed thereby, substantially as described. 75
2. In a feeding device, the combination with a selecting mechanism embodying a spirally channeled rotating selecting device, of means for presenting articles thereto, substantially as described. 80
3. In a feeding device, the combination with a spirally channeled rotating selector, of means for presenting articles thereto, and means for removing from the selector the articles not passed thereby, substantially as described. 85
4. In a feeding device, the combination with a selecting mechanism embodying a rotating selecting device having its exterior spirally channeled, of means for presenting articles thereto, substantially as described. 90
5. In a feeding device, the combination with a rotating selector having its exterior spirally channeled, of means for presenting articles thereto, and means for removing from the selector the articles not passed thereby, substantially as described. 95
6. In a feeding device, the combination with a rotating selector having its exterior spirally channeled, of means for presenting articles thereto, and an inclined guide for removing from the selector the articles not passed thereby, substantially as described. 100
7. In a feeding device, the combination with a selector, of means for moving the selector, means for presenting articles thereto, a delivery mechanism, and means for automatically stopping the movement of the selector, substantially as described. 105
8. In a feeding device, the combination with a selector, of means for rotating the selector, means for presenting articles thereto, a delivery mechanism, and means for automatically stopping the rotation of the selector, substantially as described. 110
9. In a feeding device, the combination with an exteriorly channeled selector, of means for rotating the selector, means for presenting articles thereto, a delivery mechanism, and means for automatically stopping the rotation of the selector, substantially as described. 115
10. In a feeding device, the combination with a selector having its exterior spirally channeled, of means for rotating the selector, means for presenting articles thereto, a delivery mechanism, and means for automatically stopping the rotation of the selector, substantially as described. 120
11. In a feeding device, the combination with a selector, of means for moving the selector, means for presenting articles thereto, a delivery mechanism, means for automatically stopping the movement of the selector, and means for removing from the selector the articles not passed thereby, substantially as described. 125
12. In a feeding device, the combination with a selector, of means for rotating the selector, means for presenting articles thereto, a delivery mechanism, means for automatically stopping the rotation of the selector, and means for removing from the selector the articles not passed thereby, substantially as described. 130
13. In a feeding device, the combination with an exteriorly channeled selector, of means for rotating the selector, means for presenting articles thereto, a delivery mechanism, means for automatically stopping the rotation of the selector, and means for removing from the selector the articles not passed thereby, substantially as described. 135
14. In a feeding device, the combination with a selector having its exterior spirally channeled, of means for rotating the selector, means for presenting articles thereto, a

delivery mechanism, means for automatically stopping the rotation of the selector, and means for removing from the selector the articles not passed thereby, substantially as described.

5 15. In a feeding device, the combination with a selecting mechanism embodying a rotating selector having oppositely arranged spiral channels, of means for presenting articles thereto, substantially as described.

10 16. In a feeding device, the combination with a rotating selector having oppositely arranged spiral channels, of means for presenting articles thereto, and means for removing the articles from the selector not passed thereby, substantially as described.

15 17. In a feeding device, the combination with a rotating selector having oppositely arranged spiral channels, of means for presenting articles thereto, and removing means located between the channels and operating to remove from the selector the articles not passed thereby, substantially as described.

20 18. In a feeding device, the combination with a rotating selector having oppositely arranged spiral channels, of means for presenting articles thereto, and inclined guides located between the channels and operating to remove from the selector the articles not passed thereby, substantially as described.

25 19. In a feeding device, the combination with a rotating selector having oppositely arranged spiral channels, of means for presenting articles thereto, and a block having inclined guiding faces located between the channels and operating to remove from the selector the articles not passed thereby, substantially as described.

30 20. In a feeding device, the combination with a selector mechanism, of selector rotating means, a delivery mechanism including a forward device, and means operated by the forwarding device for stopping the rotation of the selector, substantially as described.

35 21. In a feeding device, the combination with a rotating selector having its exterior spirally channeled, of means for presenting articles thereto, means for removing from the selector the articles not passed thereby, delivery means including a suitable forwarding device, means for rotating

the selector, and means under the control of the forwarding device for automatically stopping the rotation of the selector, substantially as described.

22. In a feeding device, the combination with a selector 45 mechanism, of rotating means therefor, a delivery channel, a device for forwarding the articles from the selector mechanism to the channel, a clutch mechanism, and means operated by the forwarding device for disconnecting the clutch mechanism when the channel is filled, substantially as described. 50

23. In a feeding device, the combination with a selector mechanism, of a shaft, driving means therefor, said means including a suitable clutch, means whereby the shaft drives the selector mechanism, a forwarding device operating on 55 the articles passed by the selector mechanism, means whereby the shaft drives said device, a channel into which the forwarding device delivers, and means automatically operated by the forwarding device when the channel is filled for disconnecting the clutch, substantially as described. 60

24. In a feeding device, the combination with a rotating exteriorly channeled selector, of means for presenting articles thereto, means for removing the articles not passed by the selector, a wall toward which the selector rotates, 65 and means for giving the wall a rotating movement in a direction reverse to that of the selector, substantially as described.

25. In a feeding device, the combination with a rotating selector having a spirally channeled exterior, of means for 70 presenting articles thereto, means for removing the articles not passed by the selector, a wall toward which the selector rotates, and means for giving the wall a rotating movement in a direction reverse to that of the selector, substantially as described. 75

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.