

A. RINGLAND & F. B. WOOD.
 AUTOMATIC FEEDING AND MEASURING DEVICE.
 APPLICATION FILED JULY 23, 1910.

990,593.

Patented Apr. 25, 1911.

2 SHEETS—SHEET 1.

Fig. 1.

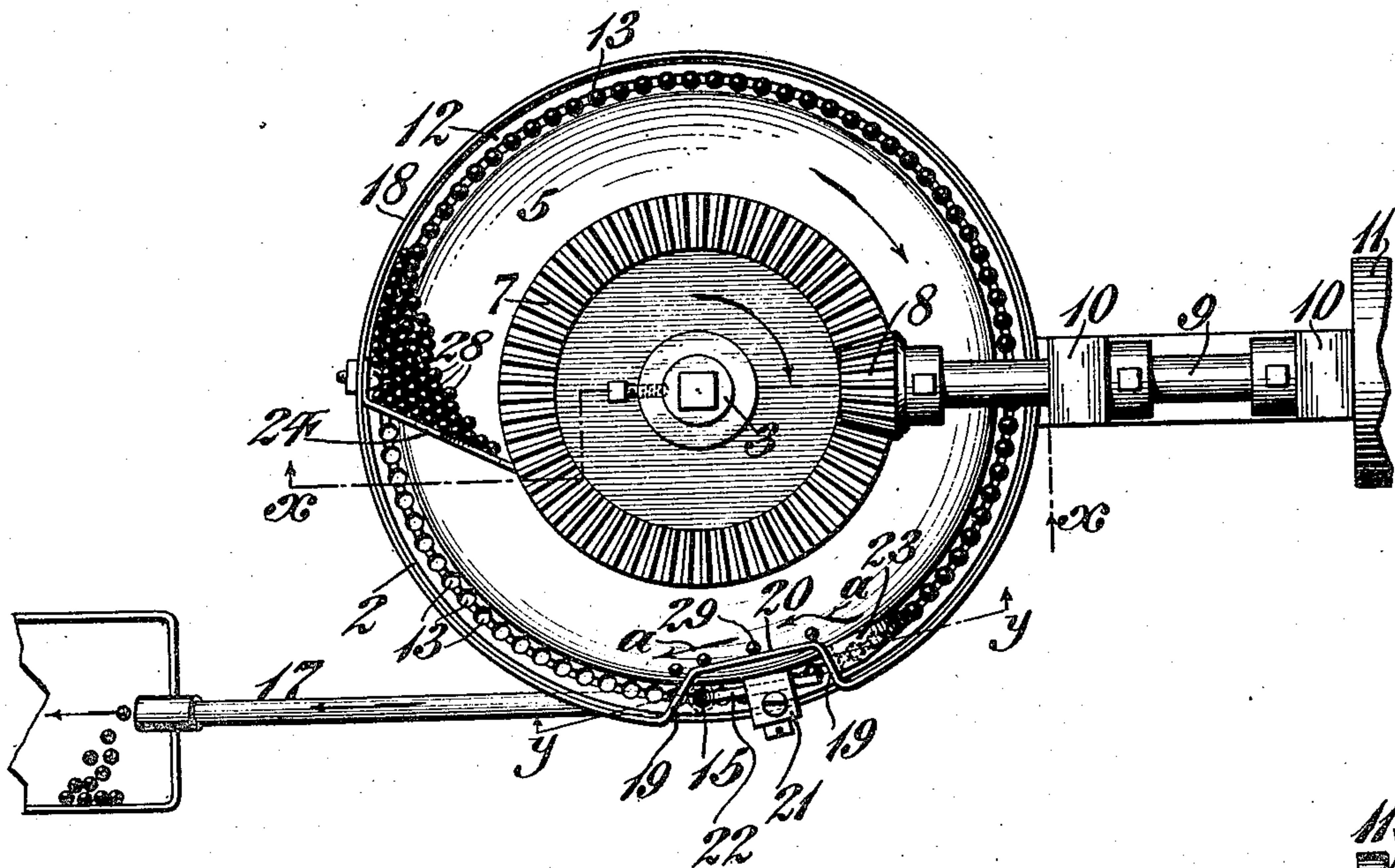


Fig. 2.

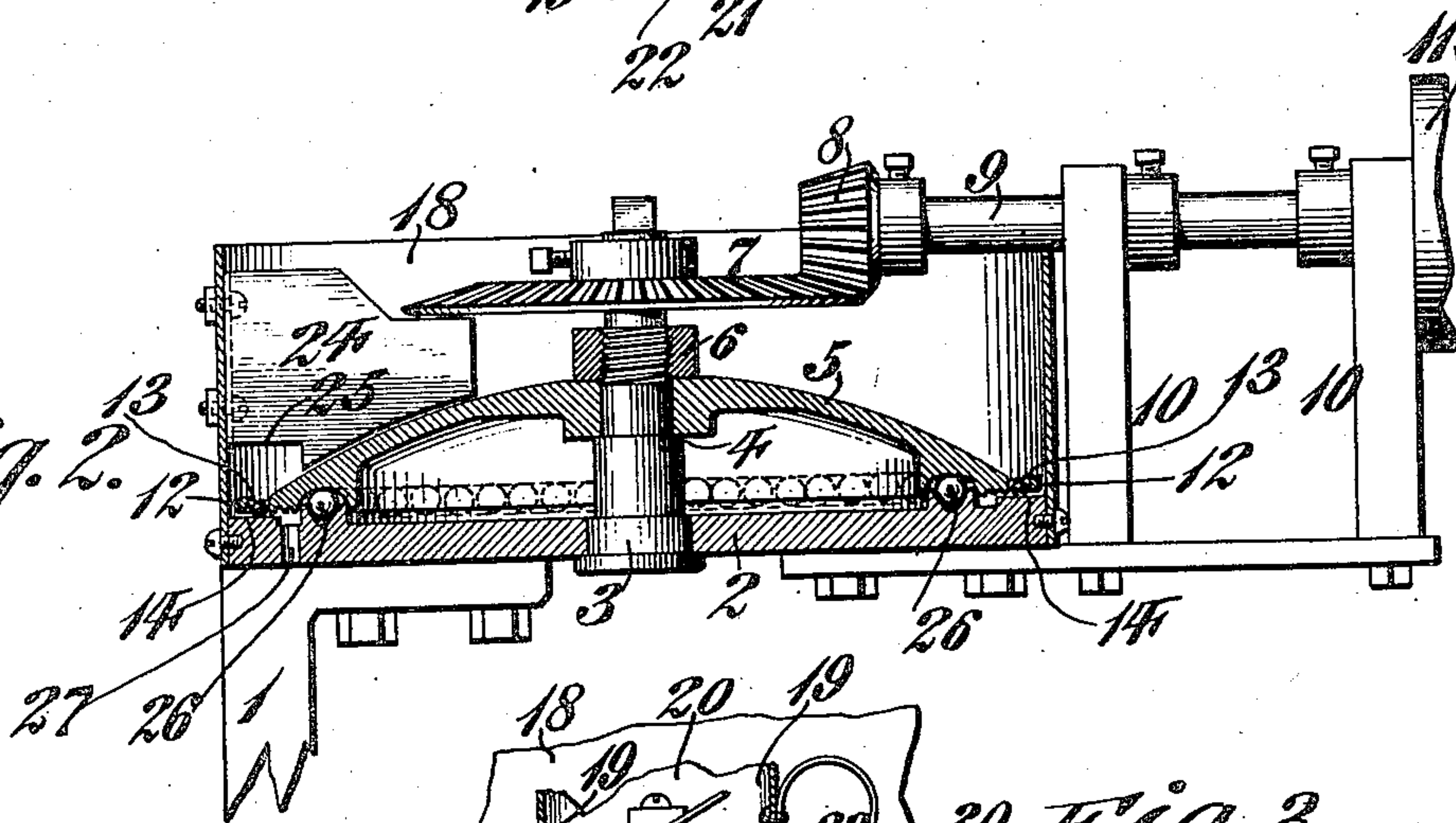
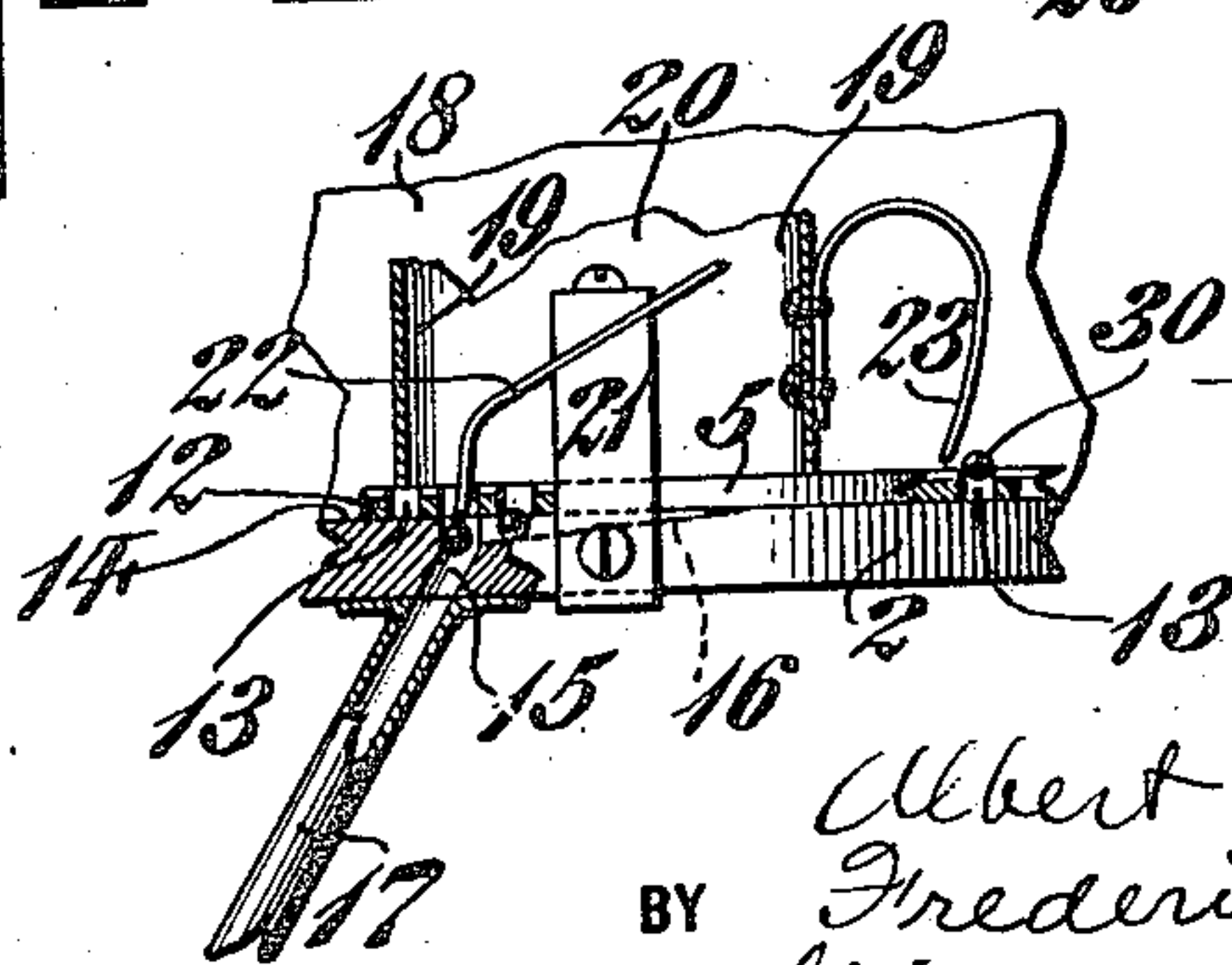


Fig. 3.



WITNESSES

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2 SHEETS—SHEET 2.

Fig. 4.

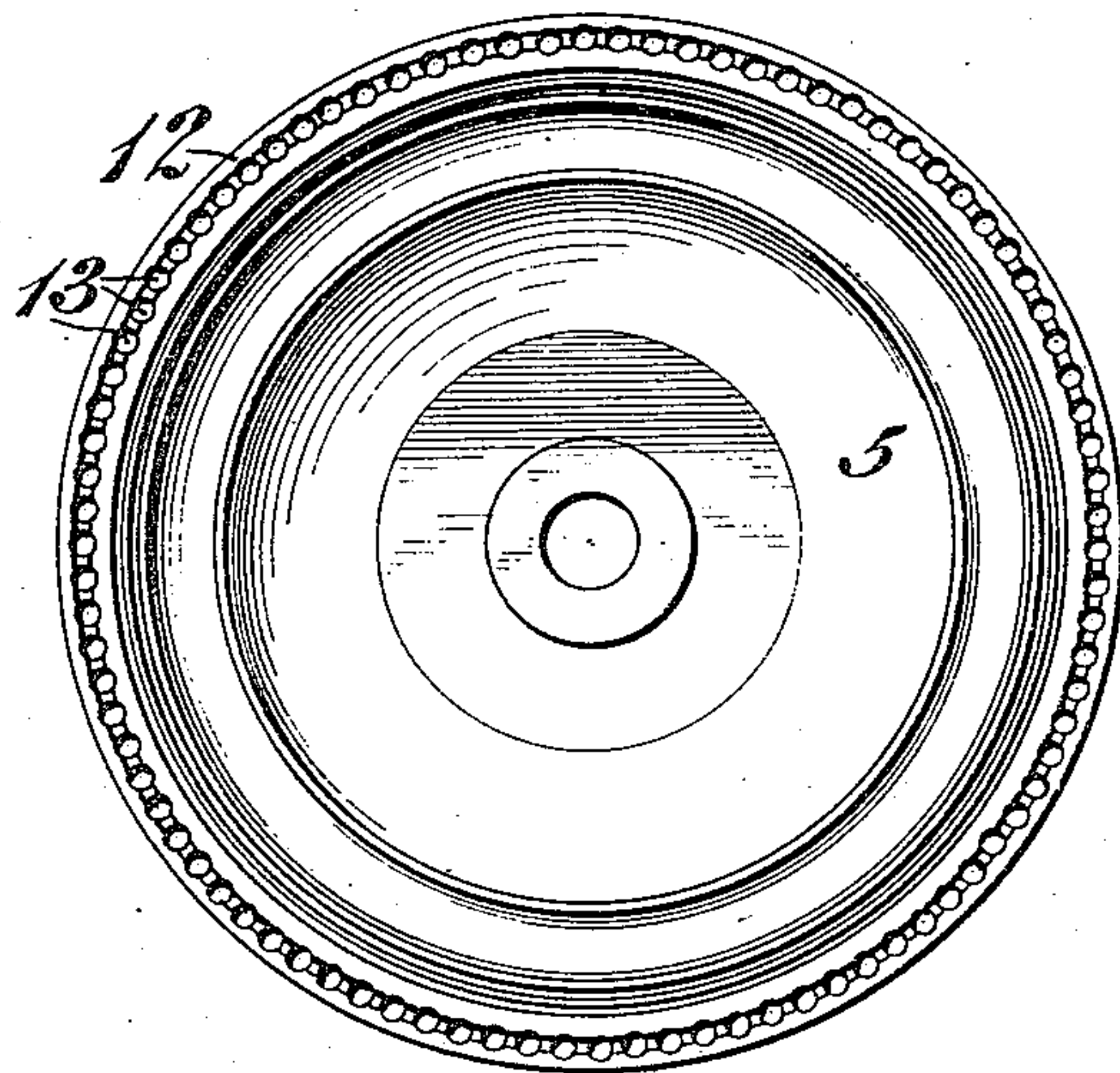
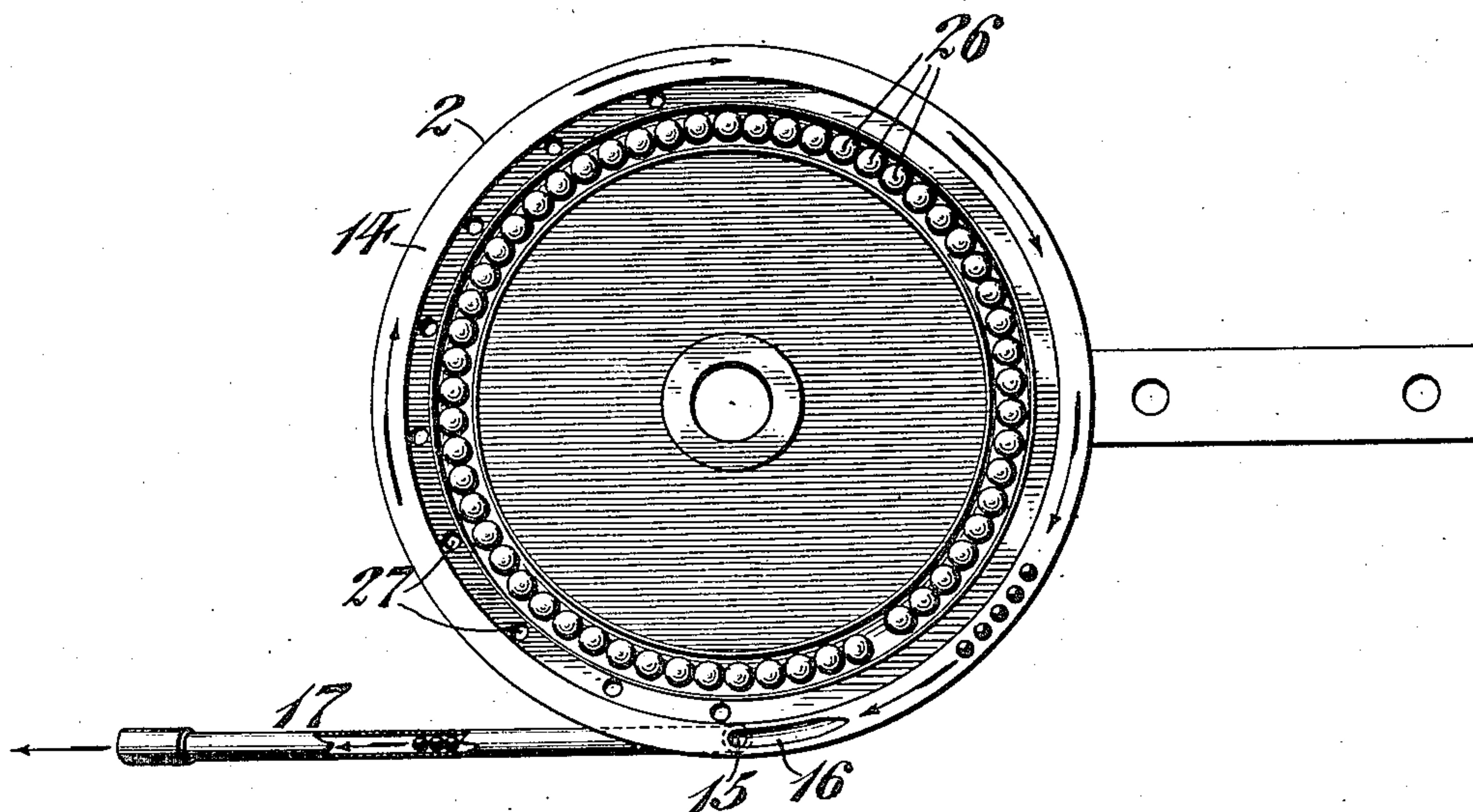


Fig. 5.

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AUTOMATIC FEEDING AND MEASURING DEVICE.

990,593.

Specification of Letters Patent.

Patented Apr. 25, 1911.

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To all whom it may concern:

Be it known that we, ALBERT RINGLAND and FREDERICK B. WOOD, citizens of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Automatic Feeding and Measuring Device, of which the following is a specification.

Our invention relates to a new and useful automatic device for use in feeding and measuring articles, such as balls, etc., and consists in providing means whereby one article at a time is fed from the device.

It further consists of means for properly positioning the articles, openings being provided for carrying the same around the device.

It further consists of means for assisting in the discharge of an article from an opening.

It further consists of novel features of construction, all as will be hereinafter set forth.

Figure 1 represents a plan view of the device for feeding balls, embodying our invention. Fig. 2 represents a sectional view on line $x-x$, Fig. 1. Fig. 3 represents a sectional view on line $y-y$, Fig. 1. Fig. 4 represents a plan view of a base plate employed, with the top portion of the device removed. Fig. 5 represents a bottom plan view of a disk or head employed.

Similar numerals of reference indicate corresponding parts in the figures.

Referring to the drawings: We have found in practice that in the handling of balls in the manufacture of the same for ball bearings, etc., and more particularly in feeding the same to the grinding machine, it is difficult to feed the same singly and in a proper manner.

Our invention is designed to overcome this defect, and in the drawings we have shown a construction which operates successfully in practice, but we desire it understood that the arrangement of the parts may be varied, other instrumentalities may be employed, and changes may be made in the construction which will come within the scope of our invention, and we do not therefore desire to be limited in every instance to the exact form as herein shown and described, but desire to make such changes as may be necessary.

1 designates a frame for the device which may be fastened to any suitable point or to a machine, such as a ball grinding machine. Carried by said frame is a base plate or support 2 provided with a suitable opening, in which is situated a spindle 3 having a suitable portion thereof in engagement with said base plate and being provided with a shoulder 4.

5 designates a disk or head adapted to be received upon the spindle 3 and having a suitable portion thereof abutting the shoulder 4 thereon, and which disk is adapted to be held in suitable connection with said spindle 3 by a nut 6 which is preferably in threaded engagement with said spindle 3, as best understood from Fig. 2.

7 designates a bevel gear suitably mounted upon said spindle 3 and which is in mesh with a pinion 8 suitably carried upon a drive shaft 9, which is journaled, in the present, in the supports 10. Any suitable means for driving said shaft 9 may be employed, and in the drawings we have shown a portion of a pulley 11 for this purpose.

From the above it will be understood that by the proper rotation of the drive shaft 9, the spindle 3 will be rotated through the medium of the pinion 8 and bevel gear 7, so that rotary movement will be imparted to the disk or head 5.

It will be noted that the top face of the disk or head 5 is rounded or inclined downwardly from the point of support of the spindle 3 and is provided with an outwardly extending flange 12 which is provided with a plurality of openings 13 forming compartments or pockets, situated around the flange at intervals, which openings are adapted to be situated over the portion 14 of the base plate 2, said portion 14 thus serving as a table or support for the balls after the same have been received or are located in the openings 13.

At a suitable point in the base plate 2, we provide a discharge opening 15 to which leads a suitable inclined groove 16 formed in said base plate 2, said groove starting at a point in the direction from which the balls travel upon said portion 14, indicated by the arrows in Fig. 4.

17 designates a discharge chute or pipe in suitable connection with the opening 15 in the base plate 2.

18 designates a plate or band which is connected with the base plate 2 and forms with the base plate a casing or receptacle into which the balls are placed in order that the same may be fed from the device. The said plate 18 is bent inwardly at 19 and is cut away from below sufficiently to allow the free passage of the flange 12 on the disk or head 5 to pass freely therebeneath, and the portion 20 of said band or plate, in the present instance, being situated at a suitable point with relation to the disk or head 5, in order to serve as a guard or guide for properly directing certain of the balls which have been carried around on the top of the disk, as will be hereinafter set forth. While we have here shown the plate 18 as bent inwardly to form the guard 20, it will be apparent that any suitable means for forming this guard may be employed.

21 designates a standard suitably connected with the base plate 2 at a suitable point adjacent the guard 20 and exteriorly thereof, said support carrying a spring finger 22, the end of which is adapted to be so situated and placed that it will successively enter the openings 13 in the flange 12 of the disk or head as they are presented thereto, as best seen in Fig. 3, in order to positively force the balls from the openings 13 into the opening 15 and so to the discharge chute or pipe 17, it being understood that as the disk or head 5 rotates, the end of the said spring finger 22 will enter an opening 13, striking the ball which has passed down the groove 16, after which the end of the said spring finger 22 will be elevated by an intervening wall as the disk or head 5 rotates, and so will enter the next opening, for the same purpose.

23 designates a spring arm suitably supported and so positioned as to be in line with the openings 13 in the flange 12, in order to force a ball into an opening 13 in case said ball should stick for any reason, and so otherwise would not be properly located in its respective opening 13.

24 designates a plate or partition, carried by the wall 18, which extends sufficiently toward the spindle 3 to suitably divide the compartment. The partition 24 is cut away at 25 to permit free passage of a certain number of the balls therethrough.

26 designates a series of balls which are carried in race-ways 26' and 26'' situated both in the base plate 2 and in the disk or head 5 for free movement of the parts. At suitable points in the base plate 2 we provide openings 27 to permit escape of oil, grease, etc., it being understood that the said plate, run-way, etc., are provided with a suitable amount of oil in order to permit free movement of the balls and the parts of the device.

The operation of the device is as follows:

A plurality of balls 28 are placed in the casing formed by the base plate and the wall 18, said balls being preferably located upon the side of the partition 24, seen in Fig. 1, that is, upon the side opposite to the direction movement of the disk or head 5. As the top face of the disk or head 5 is rounded or inclined, the balls will tend to pass downwardly to the edge of said disk and so to the openings 13 in the flange 12, each of which openings 13 is adapted to receive a ball. Motion being imparted to the drive shaft 9, the said disk or head will be rotated and the balls in the openings 13 will be carried around by said disk or head 5 upon the table or support 14 until the inclined groove 16 is reached, at which time the ball will pass downwardly in said groove to the opening 15, and so through the discharge chute or pipe 17 to a machine or other suitable place as desired.

As previously stated, the spring finger 22 will prevent any jamming or sticking of the balls, since the same successively enters the openings 13 and drives a ball into the opening 15 and to the pipe 17. As the disk or head 5 rotates, some of the balls 28 will be carried around with the same as they cannot enter any of the openings 13, and as they are carried around, these surplus balls will strike the guard 20 and be directed around, back into some of the openings 13, which are vacant, as the balls have passed therefrom, so that the said surplus balls will be properly located in an opening 13 to be carried around as the disk or head 5 rotates, and will be discharged when the opening 15 is reached. This movement of the balls is clearly seen in Fig. 1, in which 29 designates the surplus balls which are directed, as indicated in the arrows *a*, by the guard 20, around into the openings 13 which have already discharged their balls. In some instances, and for some reasons, a ball may not always pass entirely into an opening 13 and rest upon the table 14, and in order to prevent this, we have provided the spring arm 23 which is suitably located in the path of movement of the flange 12 of the disk 5, in order that should a ball remain above the top of the flange 12, this being seen in Fig. 3, the said spring arm 23 will contact with said ball 30 and will force the same into the opening 13 in which it is already partly situated, so that said ball 30 will likewise be in position to enter the groove 16 and be directed through the opening 15 into the pipe 17.

Attention is directed to the fact that by reason of the arrangement of the parts we are enabled to positively determine the number of articles fed from the machine, that is to say, any suitable number of holes or pockets can be provided or formed in the disk or plate 5, say for example, one hun-

dred, whereby it will be seen that one full rotation of the disk or head will feed one hundred articles from the machine. In this way the device serves to both automatically
 5 feed the articles and also provides means for measuring or counting the exact number of articles fed. It will be understood further, as previously stated that, while we have shown and described the automatic feeding
 10 device as applied to balls, the construction and arrangement is adapted for feeding any suitable articles, it only being necessary to make the pockets or openings in the disk and the coöperating parts, of
 15 suitable construction for this purpose.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent, is:—

1. In a device of the character stated, a
 20 disk having a plurality of openings therein, each of which is adapted to receive an article, means for rotating said disk, a support beneath said openings and upon which the
 25 articles travel, said support having an opening therein at a suitable point and through which the articles fall, and resilient means adapted to enter the disk opening when the same is in register with said support opening for positively feeding the articles to said
 30 support opening.

2. In a device of the character stated, a disk having a plurality of openings therein, each of which is adapted to receive an article, means for rotating said disk, a support
 35 beneath said openings and upon which the articles travel, said support having an opening therein at a suitable point and through which the articles fall, and a resilient arm for assisting the feed of the balls to said
 40 support opening.

3. In a device of the character stated, a disk having a plurality of openings therein, each of which is adapted to receive an article, means for rotating said disk, a support
 45 beneath said openings and upon which the articles travel, said support having an opening therein at a suitable point and through which the articles fall, means for positively feeding an article to the support opening
 50 and said support having an inclined groove leading to said support opening.

4. In a device of the character stated, a disk having a plurality of openings therein, each of which is adapted to receive an article, means for rotating said disk, a support
 55 beneath said openings and upon which the articles travel, said support having an opening therein at a suitable point and through which the articles fall, and means for guiding the surplus articles carried around upon
 60 the surface of the disk and directing the same around the support opening into a vacant disk opening after the latter has passed the support opening.

5. In a device of the character stated, a

disk having a plurality of openings therein, each of which is adapted to receive an article, means for rotating said disk, a support
 beneath said openings and upon which the articles travel, said support having an open-
 70 ing therein at a suitable point and through which the articles fall, and a resilient arm suitably positioned for forcing an article through a disk opening.

6. In a device of the character stated, a
 75 disk having a plurality of openings therein, each of which is adapted to receive an article, means for rotating said disk, a support beneath said opening and upon which the
 80 articles travel, said support having an opening therein at a suitable point and through which the articles fall, means for assisting the feed of the articles through said support opening, an inclined groove in said support,
 85 leading to said support opening, and a resilient arm suitably positioned for forcing the article into a disk opening.

7. In a device of the character stated, a disk having an inclined upper face and a
 90 plurality of openings adjacent the outer edge thereof, each of which is adapted to receive an article, a support beneath said openings and upon which the articles rest, said support having an opening into which
 95 the articles are directed from the successive openings in the disk, and continuously acting means adapted to automatically enter a disk opening as it registers with the support opening for positively passing the articles
 100 to said support opening.

8. In a device of the character stated, a dome-shaped disk and a plurality of open-
 105 ings adjacent the outer edge thereof, each of which is adapted to receive an article, a support beneath said openings and upon which the articles rest, said support having an opening into which the articles are directed from the successive openings in the
 110 disk, continuously acting means adapted to automatically enter a disk opening as it registers with the support opening for positively passing the articles to said support opening, and a guard for directing the articles carried around upon the surface of the disk
 115 into a vacant disk-opening.

9. In a device of the character stated, a disk having an inclined upper face and a
 120 plurality of openings adjacent the outer edge thereof, each of which is adapted to receive an article, a support beneath said openings and upon which the articles rest, said support having an opening into which the articles are directed from the successive openings in the disk, continuously acting means
 125 adapted to automatically enter a disk opening as it registers with the support opening for positively passing the articles to said support opening, a guard for directing the articles carried around upon the surface of
 130 the disk into a vacant disk-opening, and

means for forcing an article into a disk-opening.

10. In a device of the character stated, a casing having a base plate, a portion thereof forming a support, a disk rotatably mounted in said casing and having a plurality of openings adjacent the outer wall thereof and movable above said support, each of said openings being adapted to receive an article and to carry the same around on said support, the latter having an opening and an inclined groove, a spring finger adapted to successively enter the disk-openings to discharge the articles therefrom, a guard for the articles carried around on the face of said disk, a resilient arm for forcing an article into a disk-opening, and a partition in said casing.

11. In a device of the character stated, a casing having a base plate, a portion thereof forming a support provided with a discharge opening, a disk rotatably mounted in said casing and having a plurality of openings adjacent the outer wall thereof and said disk being movable above said support, each of said openings being adapted to receive an article and to carry the same around on said support, the latter having an inclined groove leading to the discharge opening, a spring finger adapted to successively enter the disk-openings to discharge the articles therefrom, a guard for the articles which are carried around on the face of said disk, a resilient arm for forcing an article into a disk-opening, a partition in said casing, and means for rotating said disk.

12. The combination in a feeding and measuring device, of a movable member having article receiving openings therein, a support forming a track for the articles in said openings and provided with a discharge opening, resilient means for automatically exerting pressure against an article in an opening as it comes into alinement with the discharge opening to eject it into the latter, and means for causing relative movement between said member and support.

13. The combination in a feeding and measuring device, of a disk having a plurality of openings therein, a support beneath said disk forming a track for the articles and having a discharge opening, a guard in proximity to said opening, a resilient member in proximity to said guard for forcing an article into said openings, a spring arm engaging each article as the disk opening in which it is located registers with the discharge opening to eject the article from its disk opening, and means for rotating said disk.

14. The combination in a feeding and measuring device, of a disk having a plurality of openings therein, a stationary partition suitably supported above said disk, a support beneath said disk forming a track

for the articles and having a discharge opening, a guard in proximity to said opening, a resilient member in proximity to said guard for forcing an article into said openings, a spring arm engaging each article as the disk opening in which it is located registers with the discharge opening to eject the article from its disk opening, and means for rotating said disk.

15. The combination in a feeding and measuring device, of a support forming a track for the articles and having a discharge opening and an inclined groove leading to said opening, a disk rotatably mounted above said support and having apertures in alinement with said track, a guard suitably supported and inwardly deflected to guide articles on the upper surface of the disk around the discharge opening, a spring arm for forcing an article into a disk opening, means for exerting pressure on an article in a disk opening as the same registers with the discharge opening, and means for rotating said disk.

16. The combination in a feeding and measuring device, of a support forming a track for the articles and having a discharge opening and an inclined groove leading to said opening, a disk rotatably mounted above said support and having apertures in alinement with said track, a guard suitably supported and inwardly deflected to guide articles on the upper surface of the disk around the discharge opening, a spring arm for forcing an article into a disk opening, means for exerting pressure on an article in a disk opening as the same registers with the discharge opening, a partition in said casing having an opening therethrough for passage of the articles, and means for rotating said disk.

17. In a device of the character stated, a disk having a plurality of openings therein, a support beneath said disk forming a track for the articles and having a discharge opening, means for forcing an article into a disk opening, a guard in proximity to said opening for guiding the surplus articles carried around upon the surface of the disk and for directing the same into a vacant disk opening and continuously acting means engaging the article in a disk opening, when the latter registers with the discharge opening, to eject the article from said disk opening.

18. The combination in a feeding and measuring device of a movable member formed with a series of article-receiving openings through it, a support forming a track for the articles in said openings and provided with a discharge opening, means for moving said movable member to successively bring its article receiving openings in register with the discharge opening, and continuously acting means in register with the discharge opening for successively exerting

pressure upon the articles as they arrive at said opening.

19. The combination in a feeding and measuring device of a member formed with
5 a series of article-receiving openings through it, a member having a discharge opening, means for moving one of said members in its relation to the other to successively bring an
10 article-receiving opening in register with the discharge opening, and continuously act-

ing pressure means in register with the discharge opening and successively exerting pressure upon the articles as they arrive at said opening.

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Witnesses:

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