G. KIRKEGAARD.

FEED MECHANISM FOR ASSEMBLING MACHINES.

APPLICATION FILED JUNE 9, 1909.

967,644.

Patented Aug. 16, 1910.

2 SHEETS—SHEET 1.

Fig. 1.

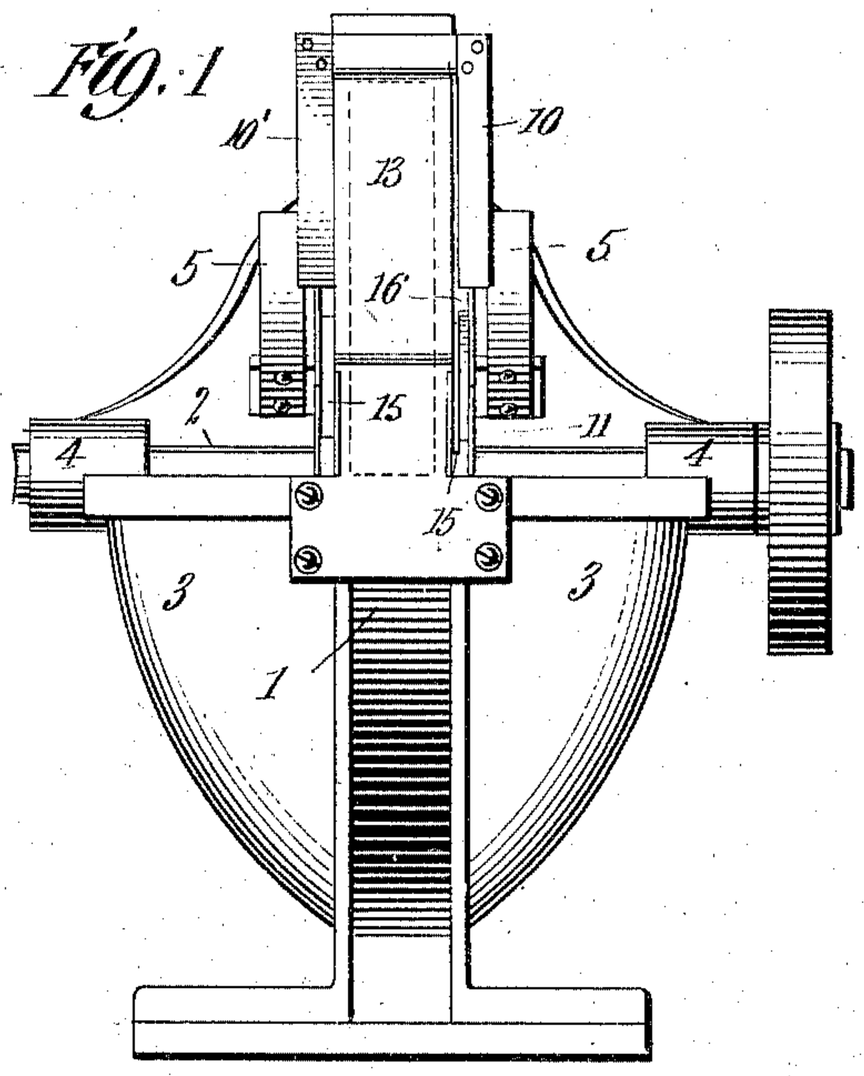


Fig. 2.

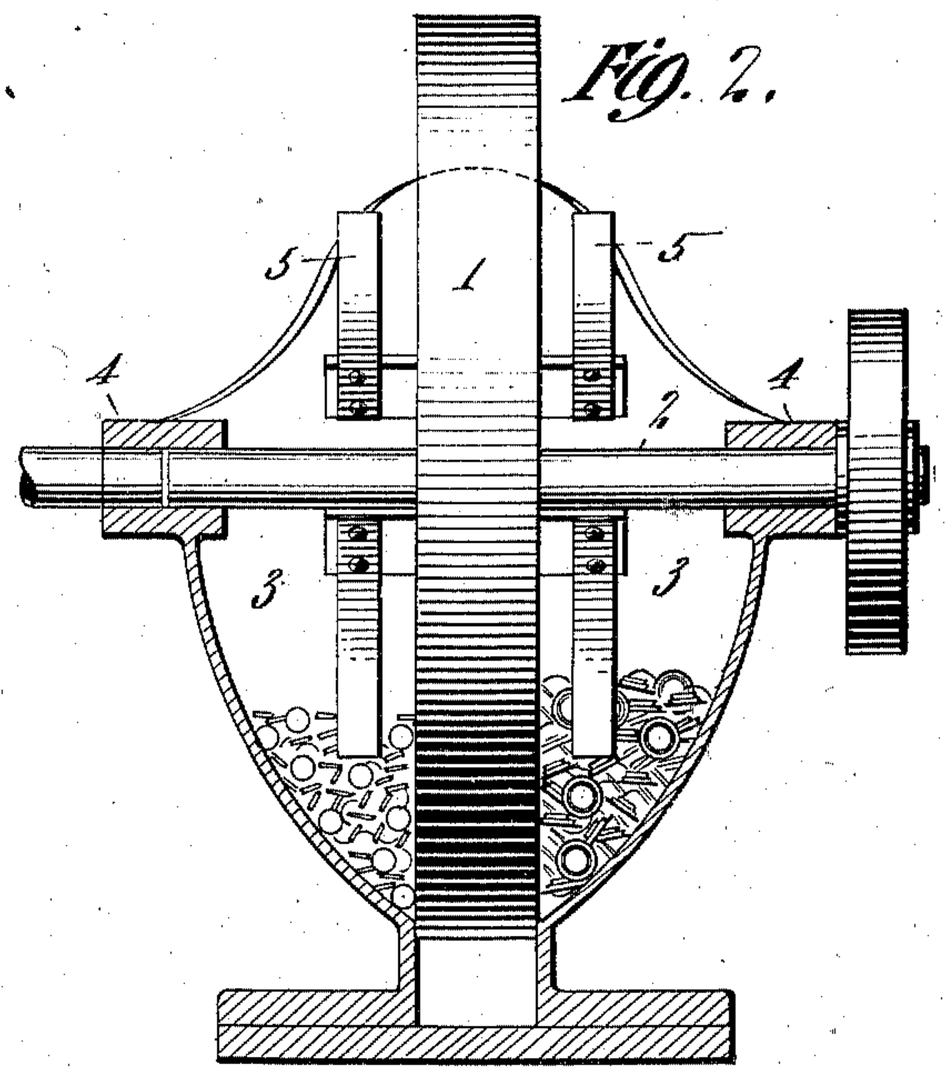


Fig. 3.

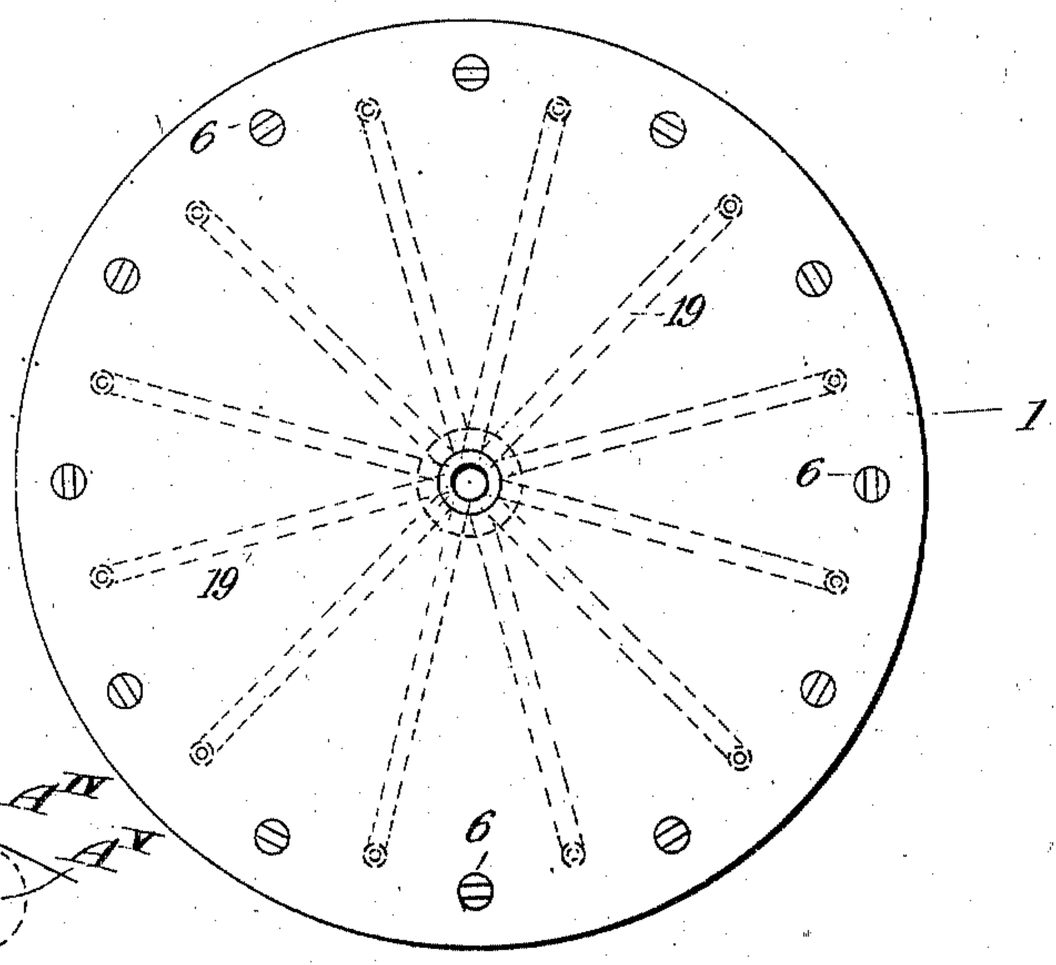
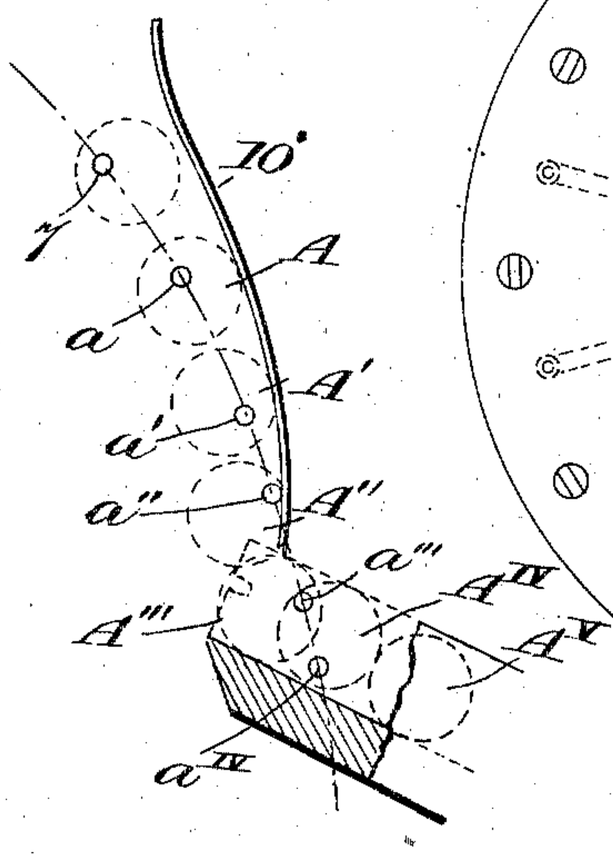


Fig. 10.



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2 SHEETS—SHEET 2.

Fig. 4

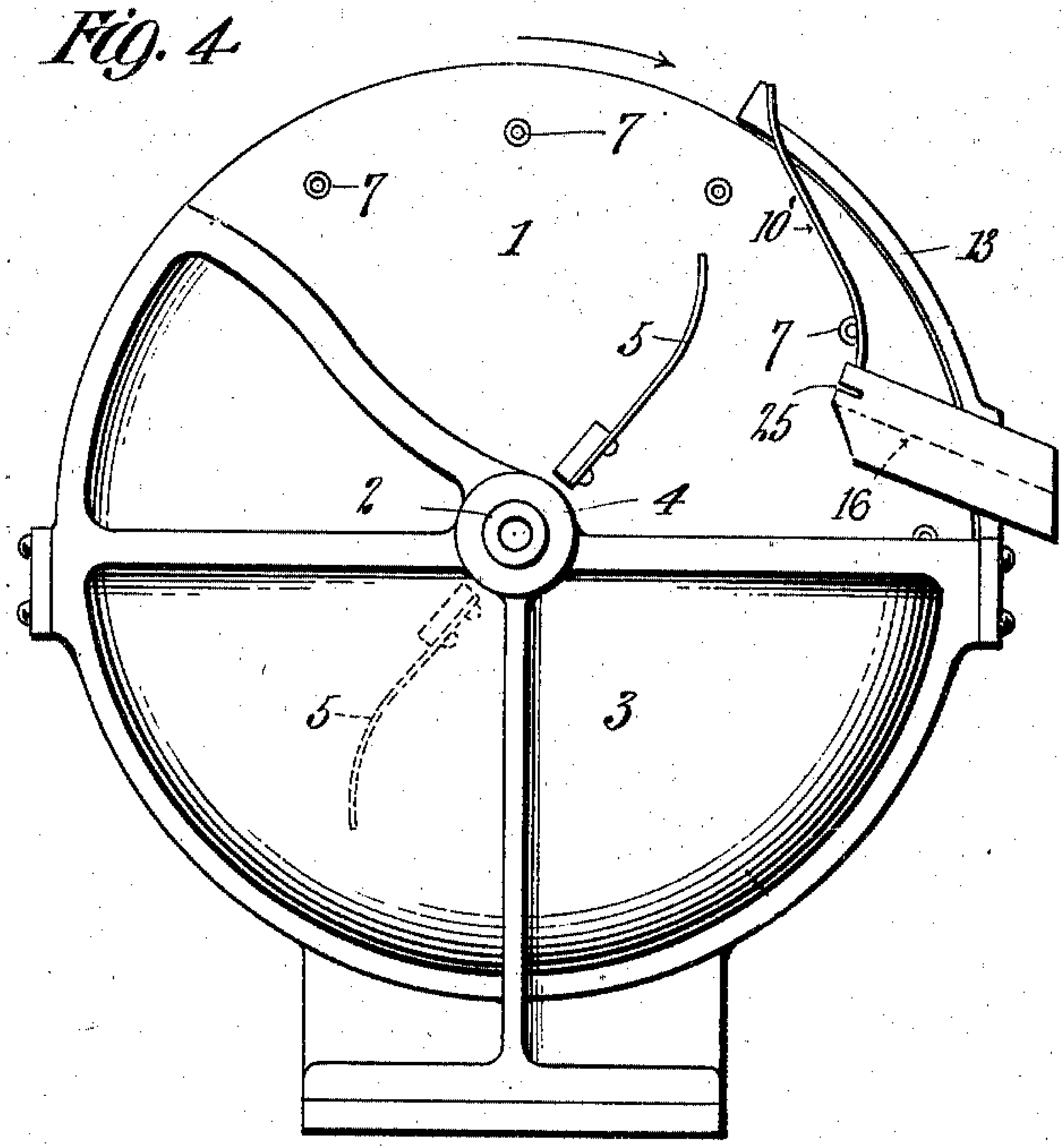


Fig. 6.

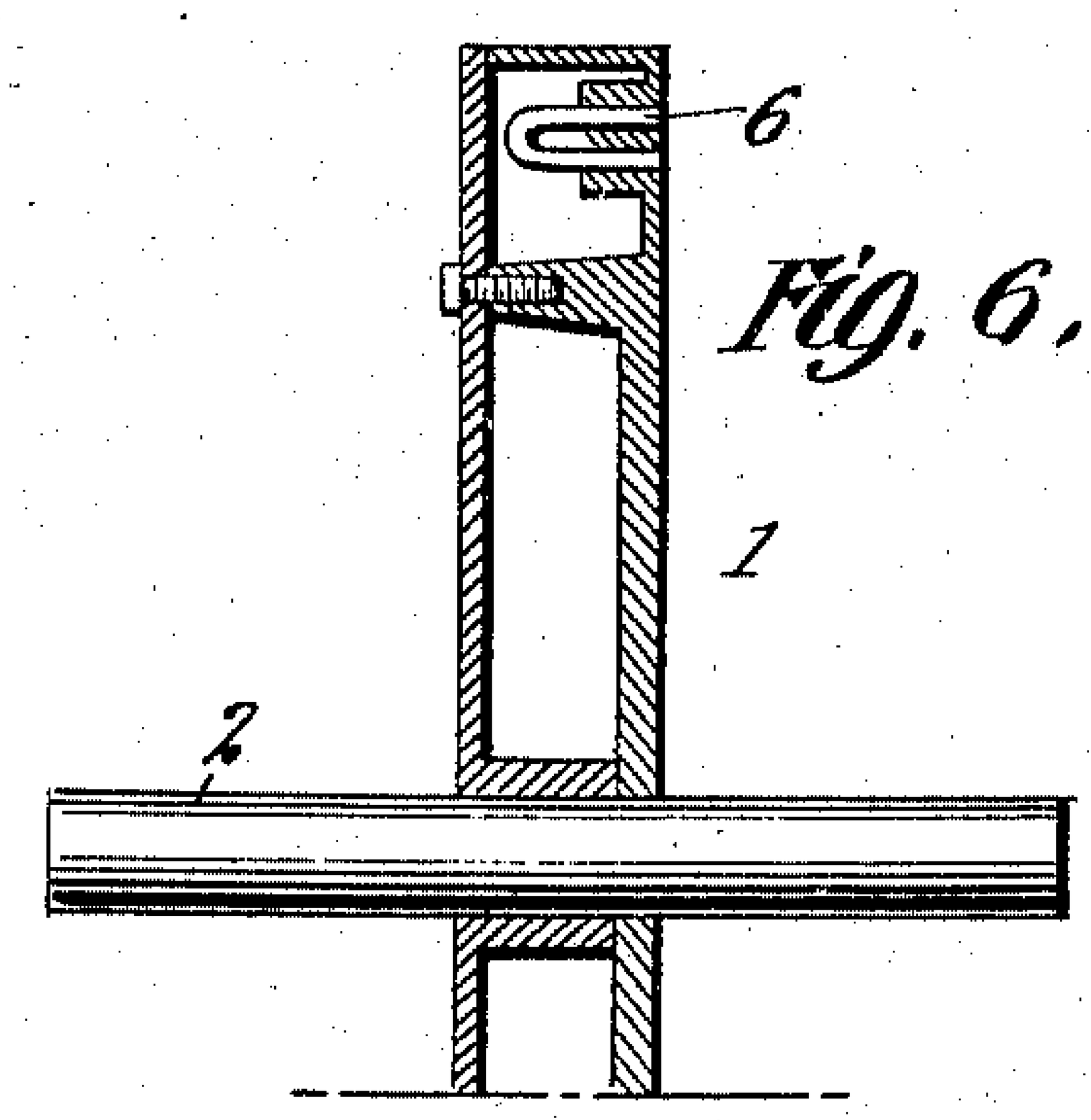


Fig. 7.

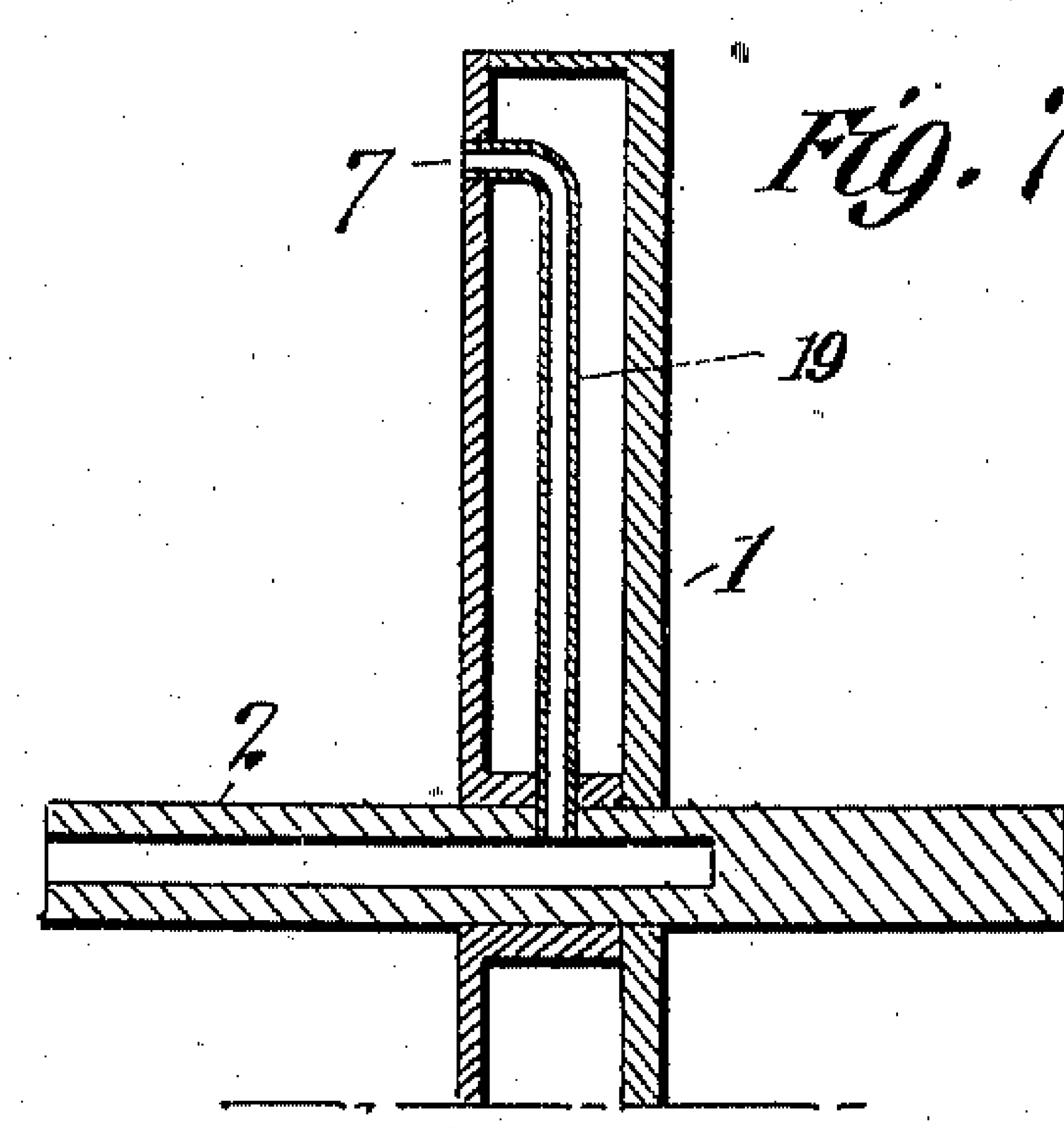


Fig. 8.

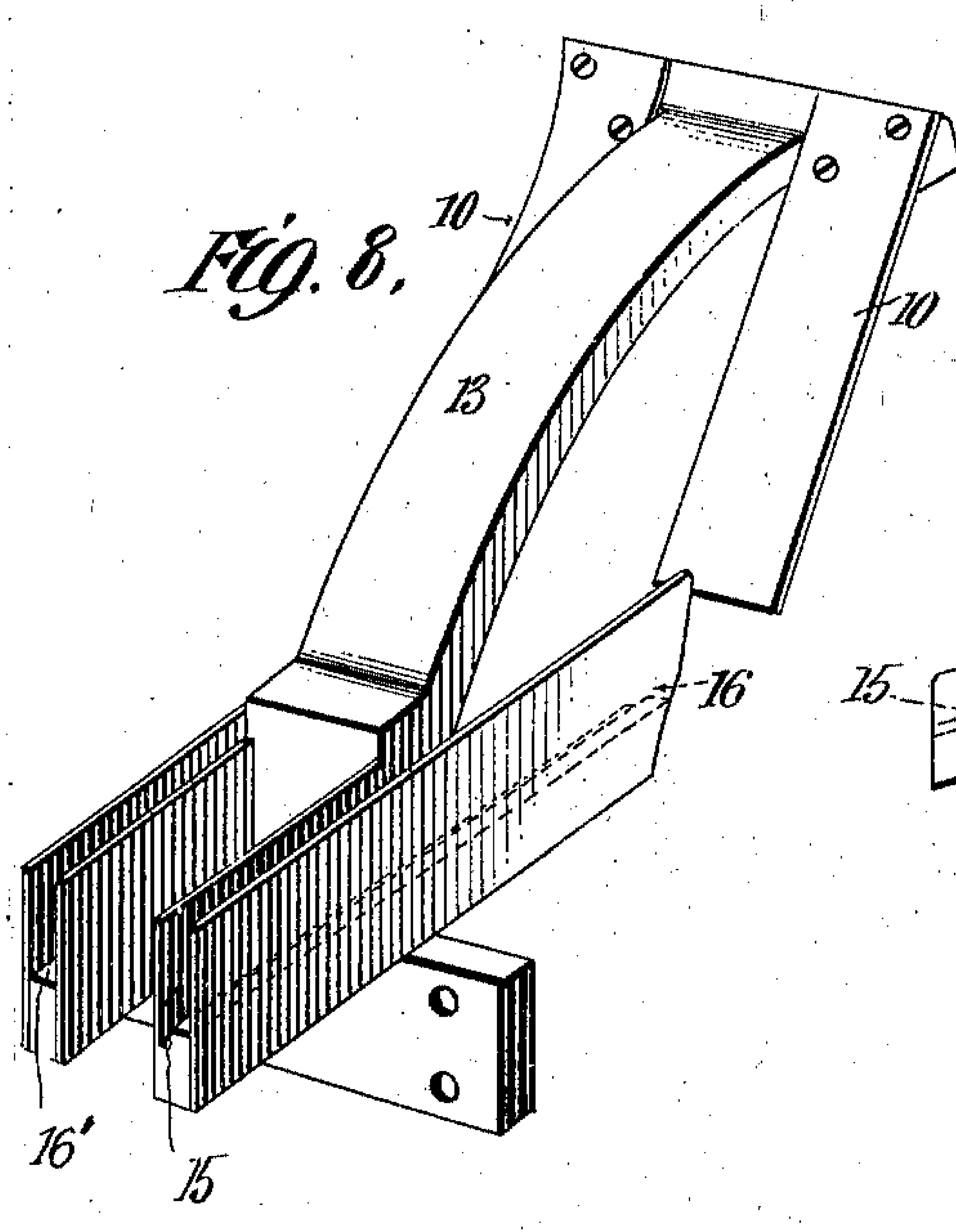


Fig. 5

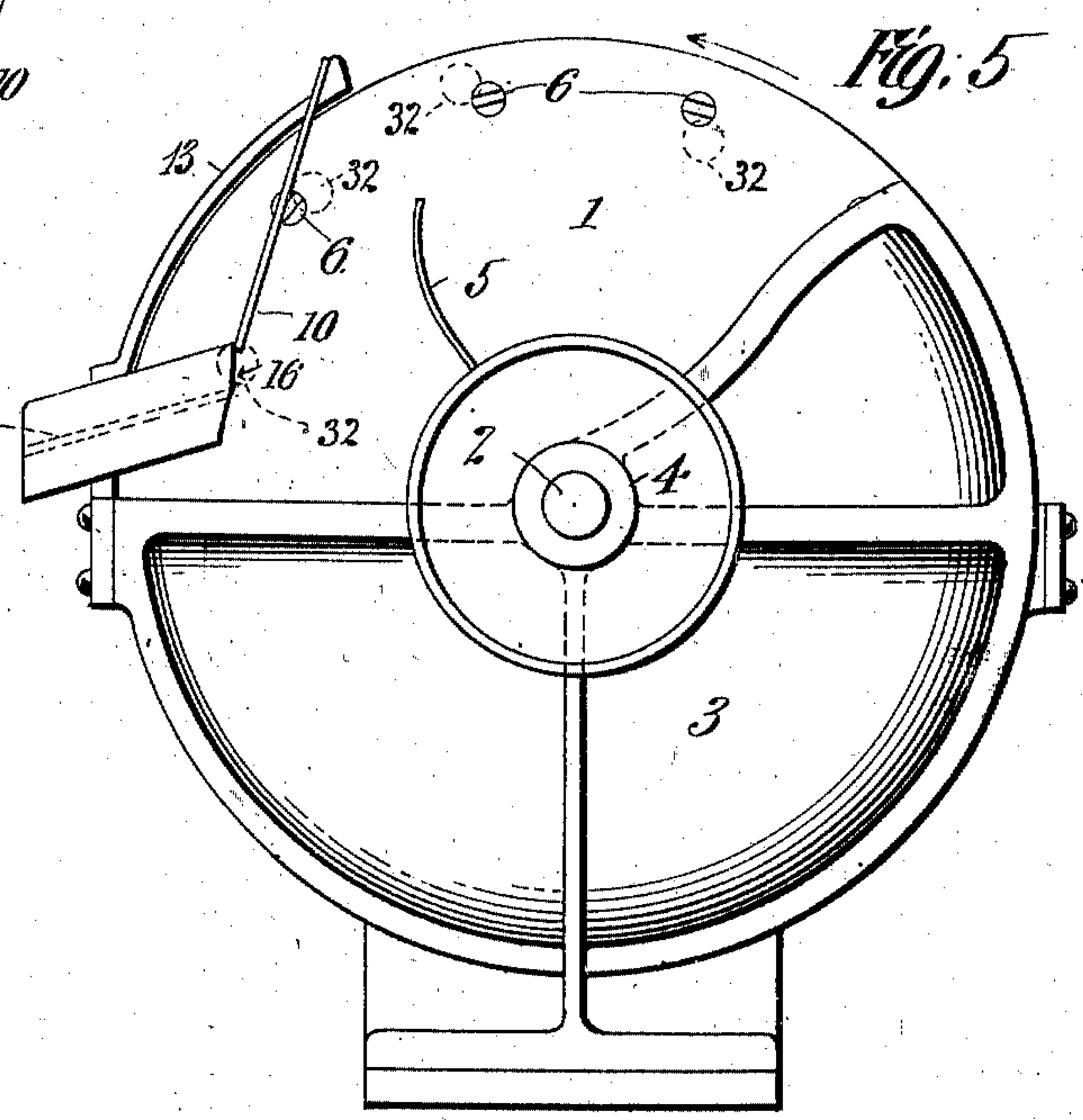
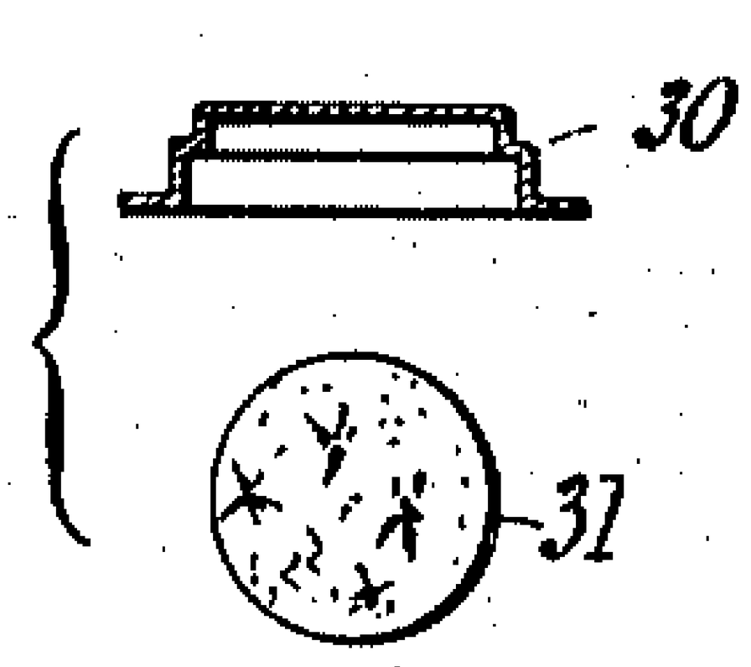


Fig. 9.



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UNITED STATES PATENT OFFICE.

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FEED MECHANISM FOR ASSEMBLING-MACHINES.

967,644. Specification of Letters Patent. Patented Aug. 16, 1910.

Application filed June 9, 1909. Serial No. 501,152.

To all whom it may concern:

Be it known that I, GEORG KIRKEGAARD, a citizen of the United States, residing at the city of New York, in the borough of Brooklyn and State of New York, have invented certain new and useful Improvements in Feed Mechanism for Assembling-Machines, of which the following is a full, clear, and exact description.

This invention is a mechanism for feeding small articles such as disks, caps, nuts, etc., to a chute or chutes for delivery to an assembling machine or at any other point desired.

One object of the invention is to provide such a device which shall be capable of simultaneously feeding the articles named from two different reservoirs or piles. For instance, in the manufacture of bottle stoppers comprising a metal cap containing inside thereof a cork disk, it is desirable to feed the caps and the cork disks at about the same rate to an assembling machine adapted to bring them together in their final relation. The present invention is intended especially to accomplish this by means of a simple mechanism efficient and sure in its operation. In the feeding of the cork disks, it is only necessary for the machine to pick up the disks one by one and deposit them into the mouth of a chute which will lead them to the assembling machine. But in the case of the metallic caps which are hat-shaped or of other irregular formation, it is required that the feeding machine shall not only pick up the pieces one by one, but that they shall be turned or faced properly before they enter the chute so that they will be properly presented to the assembling machine. My improved feeding mechanism is a single machine having the dual function of feeding the cork disks and metal caps, it being capable, in the one case, of picking up the cork disks one by one from the reservoir and carrying them to the mouth of a leading-off chute into which they are deposited one after another, and in the other case, of picking up the metal caps one by one and carrying them to the mouth of a chute where in case they are not properly faced or presented they will be discarded and delivered back to the reservoir, but in case they are properly faced, they will enter the mouth of the chute and pass thence to the assembling machine or other point of delivery. The means for picking up the articles from the reservoirs comprises a wheel or drum provided on one of its side faces with a series of small openings through which air suction is maintained, and on its other side face with the poles of a series of magnets. One reservoir is arranged on each side of the wheel so that the suction holes and the magnet poles come in contact with the contents of the reservoirs as the wheel rotates.

Certain specific features of my invention relate to the shifting of the position of the disks or caps after they are picked up from the reservoir so that they will enter the mouths of the chutes. This feature of my invention is of considerable importance since the disks and caps are necessarily picked up and held in various positions, requiring certain straightening or shifting in order that they may enter the mouths of the chutes. All such matters will be fully described in detail with reference to the accompanying drawing, in which:

Figure 1 is a front elevation of my feeding machine; Fig. 2 is a view taken from the same point as Fig. 1 but showing the reservoirs in section; Fig. 3 is a side elevation of the feed wheel; Fig. 4 is a side elevation of the entire machine; Fig. 5 is a view similar to Fig. 4 but of the opposite side of the machine; Figs. 6 and 7 are partial sectional views of the feed wheel; Fig. 8 is a perspective view of the adjusting guides and chutes, and Fig. 9 shows views of the metal caps and disks. Fig. 10 diagrammatically illustrates the action of the guide 10′ and shive channel upon the shives carried by the suction side of the carrier.

Referring to the drawing, 1 indicates a feeding wheel or drum mounted upon the horizontal axis or shaft 2 adapted to be rotated in the direction of the arrow by means of a belt applied to the pulley at the end of the shaft, or otherwise. Against each of the side faces of this wheel are fixed the dished plates 3, 3, in the nature of cheeks which together with the vertical faces of the wheel form an inclosure or reservoir on each side of the wheel. These plates cover a little more than the lower half of the wheel, leaving the upper half exposed and clear. The articles to be fed are deposited in these two reservoirs, the metallic caps being placed in one reservoir and the cork disks in the other.

The shaft bearings are at 4 being a part of the reservoir plates.

13 is a curved bracket bolted at one end to the edge of the reservoirs and extending upward around the periphery of wheel 1 approximately 60° and forming a support for two chutes 11 arranged in planes parallel to the side faces of the wheel and closely against the wheel and in an inclined position. The passages through these chutes along the portions which overlap the wheel are formed on the inside by the face of the wheel itself, and on the outside by the vertical wall of the chute itself, while the bottom is formed by a filler 16 which rubs against the face of the wheel. This filling piece 16 in one instance is provided with a longitudinal groove 15 along one edge and adapted to receive the flange 30 on the edge of the metallic bottle cap (Fig. 9) when the same is properly presented to the chute. The filler 16′ of the other chute is plain since it is adapted to receive the simple disks of cork 31. The upper end of the bracket 13 sustains two cams or guides 10 each of which consists of a plate arranged with its edge against the face of the wheel and extending downwardly to a point adjacent to the mouths of the respective chutes. The function of these cams will be explained later on.

The wheel carries a series of magnets 6 mounted in a concentric circle near the periphery of the wheel and having their poles exposed at regular intervals upon one face of the wheel as shown in Fig. 3. The magnets are of the ordinary permanent horseshoe type and they are set into the wheel so that their exposed polar faces will be perfectly smooth and flush with the outer surface of the wheel. The wheel is also provided on its opposite face with a series of small holes 7, concentrically arranged at about the same distance from the center as the magnets 6. These holes are the inlets of a series of pipes 19 arranged raidally inside of the wheel and all communicating with a passage in the shaft 2 of the wheel, as shown in Fig. 7, whereby with the aid of a suction pump applied to the end of the shaft, an air suction can be constantly maintained through all of the openings 7. The inlet to the chutes is located at a point slightly inside of the circle of magnets and the circle of suction openings respectively, and the cams 10—10′, are arranged to pass obliquely across the respective circular paths of the magnets and suction openings and terminate at the inlets to the chutes.

In the operation of the device the magnets will operate upon the metallic bottle caps while the suction openings will operate upon the cork disks. I wish to point out here however that the suction apparatus may be used on both sides of the wheel, and likewise the magnets may be used on both sides of the wheel provided the articles to be acted upon are of such material as to be attracted by the magnets. The reservoir on the side where the magnets are exposed is kept filled with the metal caps, while the reservoir on the other side is filled with the cork disks. As the wheel rotates in contact with the articles in each reservoir, the magnets and the suction openings in passing through the reservoir will pick up or attract to themselves the caps and disks, and as the wheel emerges from the reservoir it will carry with it at regular intervals a metal cap on one face and a cork disk on the other. In the cases of both the caps and the disks the position in which they may become attached to the face of the disk will be very irregular, since the cap or disk may be caught at one edge only, and it may rest either to the right or to the left, above or below the pole of the magnet or the suction opening, depending upon the interference encountered in passing through the reservoir. This irregular positioning of the caps is illustrated by the dotted lines 32 in Fig. 5. If the caps and disks were permitted to travel toward the mouth of the chutes in these irregular positions, but few of them would be properly presented to the chute and they would simply be carried back into the reservoir. Therefore in order to insure that each cap or disk which is picked up by the magnets or the suction, is delivered into the mouth of its respective chute, I have provided the cams or guides 10—10′. These inclined plates as before stated, rest with their edges against the face of the wheel, and being arranged obliquely to the path of movement of the magnets and suction openings, the caps and disks are carried against the cams which cause them to slide or roll until they have been pushed or deflected radially inward on the face of the wheel to a position immediately in front of the mouths of the chute, the magnets or suction devices respectively continuing to exert their restraining or holding influence upon the caps or cork shives during this positioning operation and until forcibly disengaged therefrom. This disengagement, in the case of the caps, occurs by reason of the magnets passing slightly behind the end of the cam 10 and diagonally across the bottom of the chute channel at the mouth of the latter, so that they continue to exercise their attractive force upon the cap and draw it into the mouth of the chute the moment it leaves the cam and is presented in front of the chute, continuing to exert their holding influence for a short distance after entry thereinto. With the cork shives the action is necessarily slightly different; the positioning cam 10′ slides the shives, as they encounter it, over the face of the wheel without causing the disengagement of the shives therefrom un-

til the suction holes pass under the edge of substantially the extreme end of the cam, or are laterally displaced to such an extent as to lose their holding action on the shives by passing beyond the peripheral edges thereof. The successive positions occupied by the shives have been diagrammatically indicated in Fig. 10 and marked A, A′, A″, etc., while the relative positions of the suction holes are marked *a*, *a′*, *a″*, etc., and it will be observed by reference to Figs. 4 and 10, that while the cam may be so positioned that the suction holes pass diagonally behind the end thereof, since one side and the bottom of the chute extend out beyond said end of the cam, the released shives will drop into said chute, and when fairly entered thereinto, will, by reason of the fact that the side of the chute adjacent the wheel is not extended thereover, be further subject to the action of the suction device since the respective hole will again be covered by the shive or a succeeding hole will be so covered, depending on the speed of rotation of the wheel, and owing to the line of travel of such hole being diagonally disposed with respect to the bottom of the chute, will urge the shive farther down into the chute, thus insuring space for the next shive to fall into. As soon as the cap or cork shive has been so drawn into the chute against and along the bottom thereof, the magnet or suction opening passes on and the cap or disk is free to roll down the chute to the assembling machine or other point where it is to be utilized. The cams 10 therefore serve to shift or alter the positions of the caps or disks so that they will all be uniformly brought directly to the mouth of the chute.

If the mechanism is used for feeding to an assembling machine, it is desirable to have the metal caps enter the chute with their flanges all faced in one direction. To accomplish this and prevent any of them from entering the chute with their flanges facing in the wrong direction, the groove 15 in the bottom of the chute is provided. This groove begins at the very mouth of the chute and the distance from the bottom of the groove to the end of the cam 10 is just about equal to the diameter of the cap across its flange, so that the cap will be admitted to the chute if the flange enters the groove. On the other hand, if the flange is faced in the opposite direction, the distance between the bottom of the chute and the end of the cam 10 is not so great as the diameter of the cap across the flange, and consequently the cap cannot enter the mouth of the chute, and it will simply fall back into the reservoir when the magnet has passed beyond and released it. In the case of the cork disks, it sometimes happens that two unusually thin disks or an unusually thick disk will become crowded into the mouth of the chute and choke it. To relieve this condition I provide the slot 25 (Fig. 4) through which a pointed tool can be inserted to force the stalled disk out.

5, 5, indicate spring arms which are carried by the wheel to stir up the mass of disks and caps in the reservoir and avoid any packing which might prevent the magnets or suction from picking up the articles.

Having described my invention, I claim:—

1. In a feeding mechanism, a reservoir, a feeding wheel positioned to divide said reservoir into two distinct and separate compartments, said wheel coöperating independently with each compartment, and chutes cooperating with the parts aforesaid to effect delivery of articles from said compartments.

2. In a feeding mechanism, the combination of a feeding wheel having pick-up devices in one of the flanks thereof for retaining articles in position thereagainst, a reservoir, a chute and a cam whereby the articles picked up by the wheel are adjusted to uniform position for presentation to the chute while being held by said pick-up devices, substantially as described.

3. A feeding device for assembling machines comprising a wheel having attracting devices on its face, a positioning guide relatively inclined to the path of movement of said attracting devices, and a stripping guide providing a channel opening at the termination of said positioning guide, said opening being in a plane adjacent to that in which the attracting devices move.

4. A feeding device for assembling machines comprising a wheel having attracting devices on its face, a positioning guide relatively inclined to the path of movement of said attracting devices, and a stripping guide having a channel with a gate located adjacent the termination of said positioning guide.

5. A feeding device for assembling machines comprising a wheel having magnets on its face, a positioning guide relatively inclined to the path of movement of said attracting devices, and a stripping guide providing a channel opening at the termination of said positioning guide.

6. A feeding device for assembling machines comprising a wheel having suction openings on its face, a positioning guide relatively inclined to the path of movement of such suction openings, and a stripping guide providing a channel opening adjacent the termination of said positioning guide.

7. A feeding device for assembling machines comprising a wheel having magnets on one face and suction openings on the other face, positioning guides relatively inclined to the paths of movement of points upon said faces, and a stripping guide providing a channel opening at the termination of each positioning guide.

8. A feeding device for assembling machines comprising a wheel having attracting devices on its face, a positioning guide relatively inclined to the path of movement of said attracting devices, and a stripping guide providing a channel having a gate at the termination of said positioning guide, said gate being shaped to receive properly faced objects entering said channel.

9. A feeding device for assembling machines comprising a wheel having attracting devices on its face, a positioning guide relatively inclined to the path of movement of said attracting devices, and a stripping guide providing a channel having a gate at the termination of said positioning guide, said gate being shaped to receive properly faced objects entering said channel and being arranged substantially parallel to the general plane of movement of the attracting devices.

10. A feeding device for assembling machines comprising a wheel having attracting devices on its face, a reservoir exposed adjacent to said face, a positioning guide relatively inclined to the path of movement of said attracting devices, and a stripping guide providing a channel opening at the termination of said positioning guide.

11. A feeding device for assembling machines comprising a wheel having attracting devices on both side faces, separate reservoirs communicating with such side faces, positioning guides relatively inclined to the paths of movement of said attracting devices, and stripping guides providing channels opening substantially at the termination of said positioning guides.

12. A feeding device for assembling machines comprising a wheel having attracting devices on its side faces, reservoirs on each side of the wheel in which said side faces are exposed, positioning guides relatively inclined to the paths of movement of said attracting devices, stripping guides providing channel openings at the termination of said positioning guides.

13. A feeding device for assembling machines comprising a wheel having an attracting device on its face, a positioning guide relatively inclined to the path of movement of said attracting device, a stripping guide providing a channel opening at the termination of said positioning guide, a reservoir in proximity to said wheel and into which said face thereof is exposed, and a stirring arm fixed to rotate with the wheel and entering said reservoir.

14. A feeding device for assembling machines comprising a wheel having an attracting device on its face, a reservoir into which said face is exposed, means across the path of movement of said attracting device for properly alining attracted articles without disengaging the same, and a gate at the termination of said means.

15. A feeding device for assembling machines comprising a wheel having attracting devices on its face, a reservoir into which the outer portion of said face is exposed, means across the path of movement of said attracting devices for properly alining attracted articles without disengaging the same, and a gate in the path of rotation of said wheel beyond the termination of said means.

16. A feeding device for assembling machines comprising a wheel having an attracting device on its face, a reservoir into which the outer portion of said face is exposed, a positioning guide relatively inclined to the path of movement of said attracting device, and a stripping guide providing a channel having an opening at the termination of said positioning guide.

17. A feeding device for assembling machines comprising a wheel having an attracting device on its face, a reservoir into which the outer portion of said face is exposed, a positioning guide relatively inclined to the path of movement of said attracting device, and a stripping guide providing a channel having an opening at the termination of said positioning guide, said opening being in a plane adjacent to the general plane of movement of the attracting device.

18. A feeding device for assembling machines comprising a wheel having attracting devices on its face, a reservoir into which the outer portion of said face is exposed, a positioning guide relatively inclined to the path of movement of said attracting devices, and a stripping guide providing a channel having a gate at the termination of said positioning guide, said gate being adapted to receive properly faced objects entering said channel.

19. A feeding device for assembling machines comprising a wheel having attracting devices on its face, a reservoir into which the outer portion of said face is exposed, a positioning guide relatively inclined to the path of movement of said attracting devices, and a stripping guide providing a channel having a gate at the termination of said positioning guide, said gate being adapted to receive properly faced objects entering said channel and being positioned adjacent the plane of movement of said attracting devices.

20. A feeding device for assembling machines comprising a carrying member, pneumatic attracting means in connection therewith and a cam for properly positioning articles supported thereby, after said articles have been secured to said member, said cam operating in such manner that the articles may after engagement therewith travel in a predetermined path while continuing to be carried by said carrying member.

21. A feeding device for assembling ma-

chines comprising a carrying member, magnetic attracting means in connection therewith and a cam for properly positioning articles supported thereby, after said articles have been secured to said member, said cam operating in such manner that the articles may after engagement therewith travel in a predetermined path while continuing to be carried by said carrying member.

22. A feeding device for assembling machines comprising a carrying member, attracting means in connection therewith and a cam for properly positioning articles supported thereby, after said articles have been secured to said member, said cam operating in such manner that the articles may after engagement therewith travel in a predetermined path while continuing to be carried by said carrying member.

23. A feeding device for assembling machines comprising carrying means, pneumatic attracting means in connection therewith for attracting certain articles, magnetic means in connection therewith for attracting magnetizable articles and cams for properly positioning the articles aforesaid after said articles have been secured to said carrying means, said cams operating in such manner that the articles may after engagement therewith, travel in a predetermined path while continuing to be carried by said carrying member.

24. A feeding device for assembling machines comprising a carrying wheel having on one side thereof magnets for attracting magnetizable articles, and on the other side pneumatically acting means for attracting a substantially proportionate number of non-magnetizable articles.

25. A feeding device for assembling machines comprising a carrying wheel having on one side thereof magnets for attracting magnetizable articles, and on the other side pneumatically acting means for attracting a substantially proportionate number of non-magnetizable articles, and guides for properly positioning the articles aforesaid after said articles have been secured to said wheel, said guides operating in such manner that the articles may after engagement therewith, travel in predetermined paths while continuing to be carried by said carrying member.

26. A feeding device for assembling machines comprising a plurality of reservoirs, a plate therebetween having upon one side thereof a series of magnets and upon the other side a proportionate series of means whereby articles may be held to the plate pneumatically, and means for rotating said plate.

27. In a feeding mechanism, a single reservoir, a feeding wheel positioned to divide said reservoir into two distinct compartments, said wheel coöperating independently with each compartment.

In witness whereof, I subscribe my signature, in the presence of two witnesses.

GEORG KIRKEGAARD.

Witnesses:
WALDO M. CHAPIN,
WILLIAM C. LARY.