

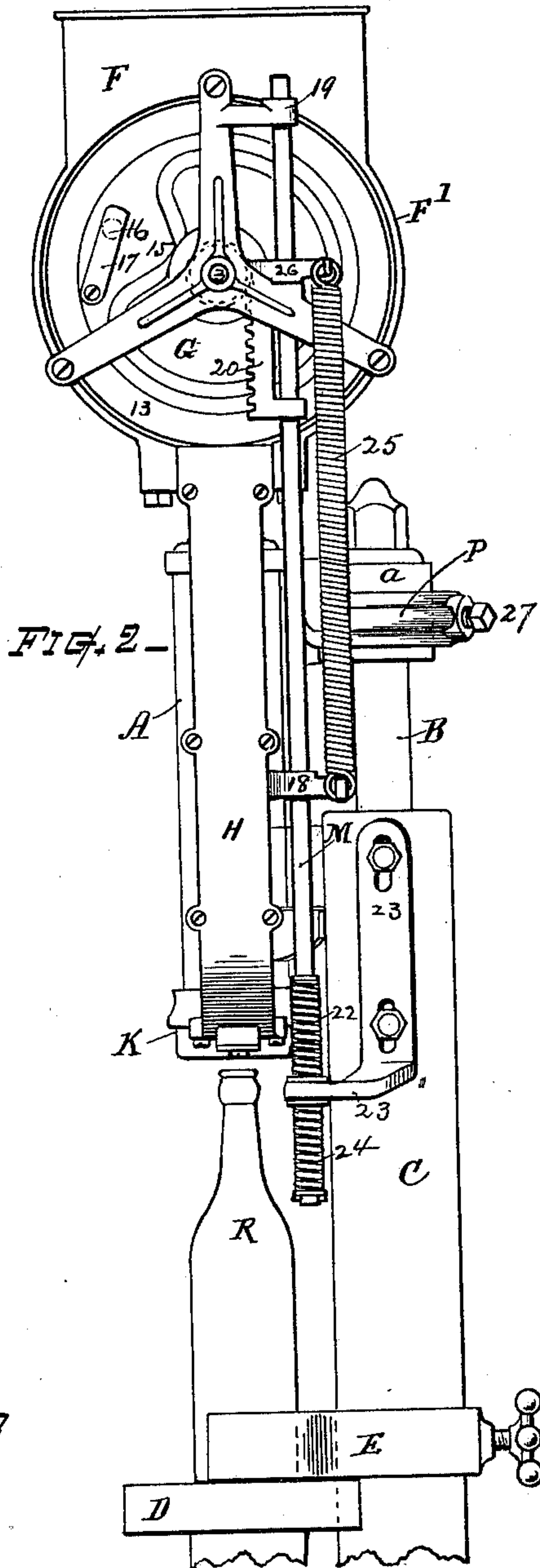
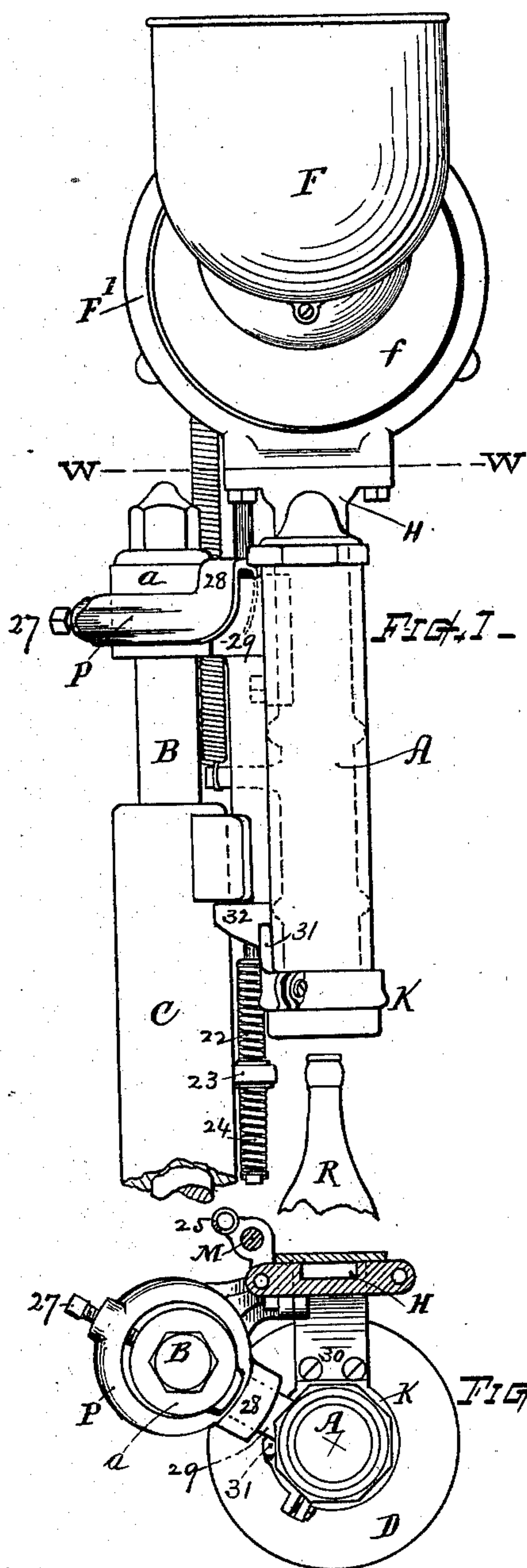
No. 732,987.

PATENTED JULY 7, 1903.

F. O. WOODLAND.  
AUTOMATIC FEEDER MECHANISM FOR BOTTLE STOPPERING MACHINES, &c.  
APPLICATION FILED APR. 15, 1901.

NO MODEL.

3 SHEETS—SHEET 1.



Witnesses.

Charles A. Bacon  
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Inventor.

Frank O. Woodland.  
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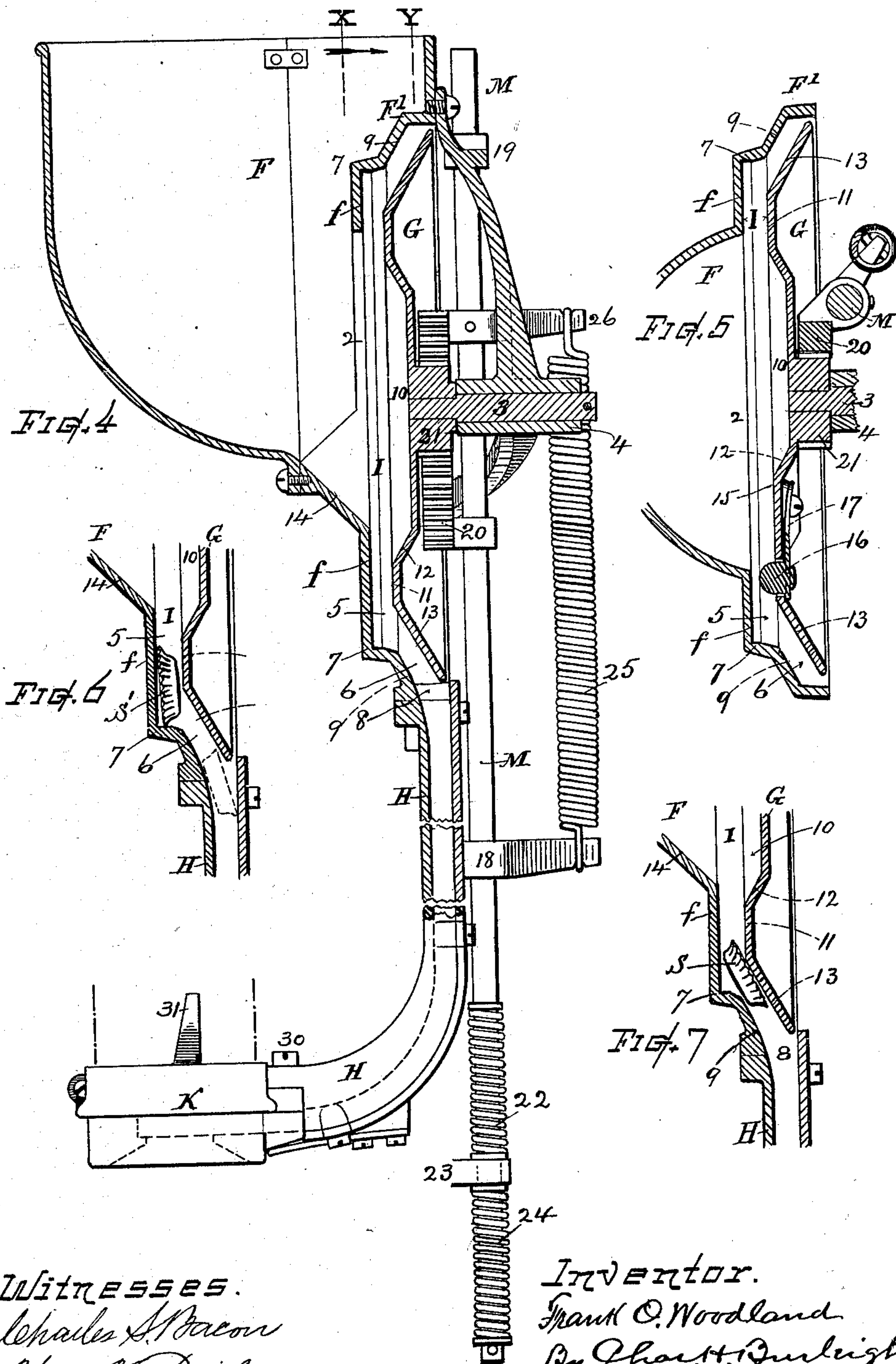
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3 SHEETS—SHEET 2.



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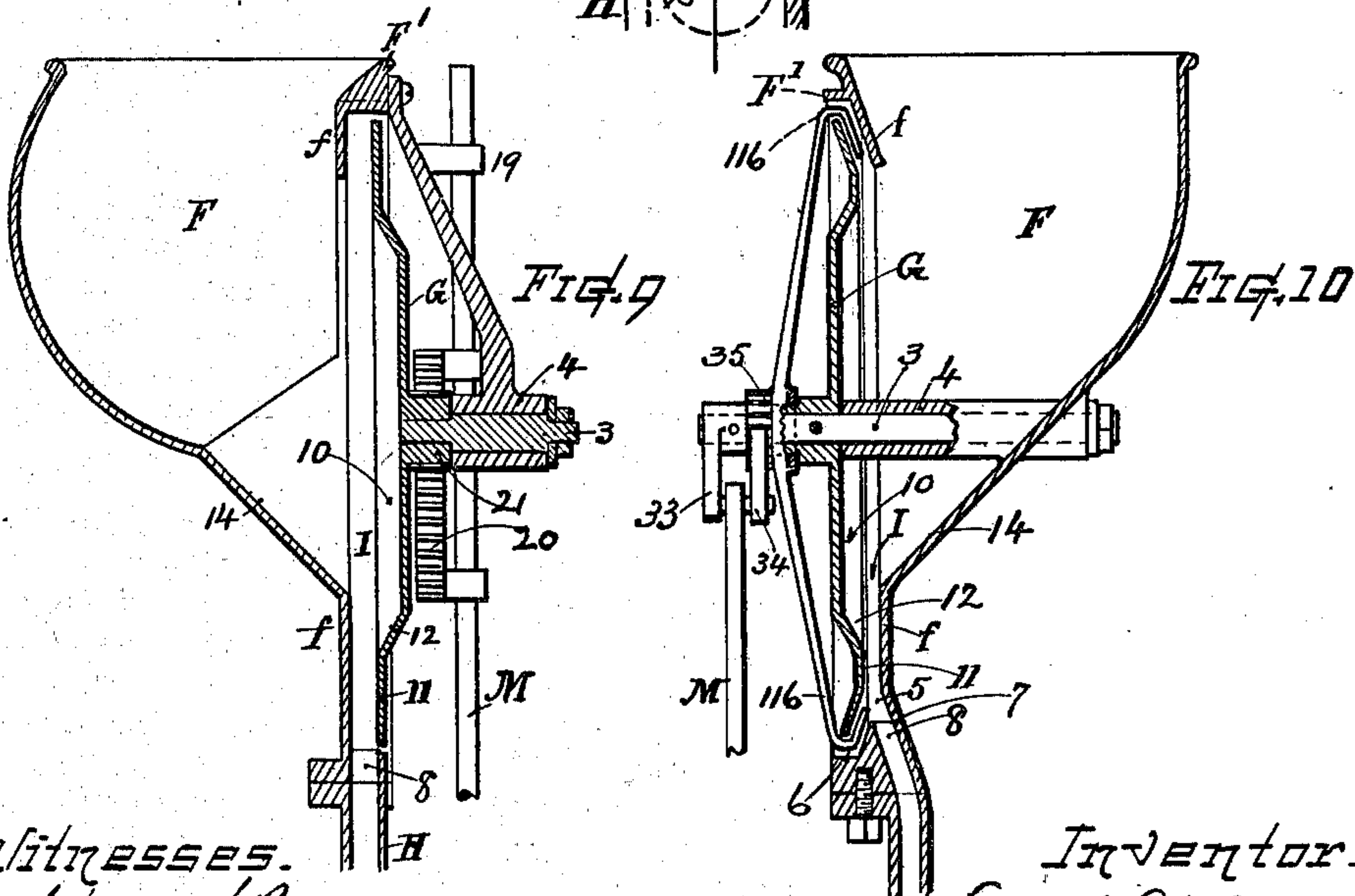
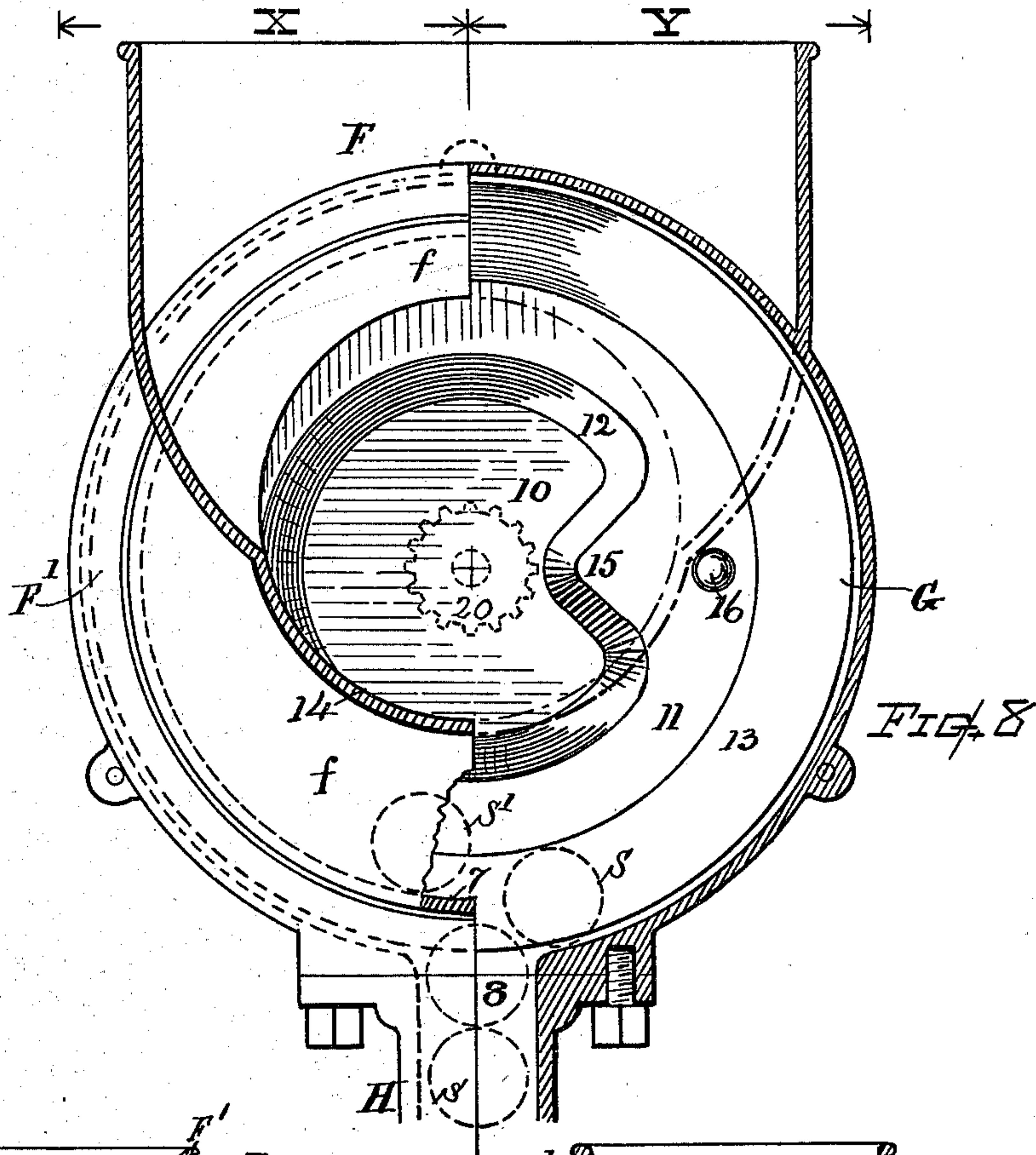
F. O. WOODLAND.

AUTOMATIC FEEDER MECHANISM FOR BOTTLE STOPPERING MACHINES, &c.

APPLICATION FILED APR. 16, 1901.

NO MODEL.

3 SHEETS—SHEET 3.



Witnesses.

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# UNITED STATES PATENT OFFICE.

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## AUTOMATIC FEEDER MECHANISM FOR BOTTLE-STOPPERING MACHINES; &c.

SPECIFICATION forming part of Letters Patent No. 732,987, dated July 7, 1903.

Application filed April 15, 1901. Serial No. 55,827. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK O. WOODLAND, a subject of the King of Sweden and Norway, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Automatic Feeder Mechanism for Bottle-Stoppering Machines, &c., of which the following, together with the accompanying drawings, is a specification sufficiently full, clear, and exact to enable persons skilled in the art to which this invention appertains to make and use the same.

My present invention relates to the nature and construction of mechanism for selecting and delivering in regular and successive order such articles as crown bottle-stoppers, sealing-caps, and other analogous disk-shaped articles that will not uniformly balance when on edge; also, to the construction and combinations whereby such mechanism is made available for use in connection with a bottle-stoppering machine for delivering the crowns or stoppers to the bottle-capping appliances, the object being to provide a simple, durable, and highly-efficient feeder mechanism of the character set forth.

The nature of the invention and particular subject-matter claimed are hereinafter definitely specified, and a mechanism embodying my invention is illustrated in the drawings, wherein—

Figure 1 represents a front view of my feeder mechanism as applied to a crown corking or stoppering machine. Fig. 2 represents a back view of the same. Fig. 3 is a plan or horizontal section below the line W W. Fig. 4 is a central vertical section of the hopper and crown-separating mechanism, on somewhat larger scale. Fig. 5 is a transverse central section of the separator-way and oscillating plate. Figs. 6 and 7 represent similar section diagrams illustrating the manner in which oppositely-facing disks or crowns are separated for delivery in regular order. Fig. 8 is a vertical sectional view of the back portion of the hopper mechanism, one-half at line X and one-half at line Y, Fig. 4, looking in the direction indicated by the arrow; and Figs. 9 and 10 illustrate modifications the nature of which is hereinafter explained.

My improved mechanism is more especially designed for use in combination with bottle-stoppering machines of the class known as "crown beer or wine machines," and is herein illustrated (see Figs. 1 and 2) as applied to such a machine, which comprises a vertically-reciprocating head A, containing within it suitable devices for receiving the crown-stoppers and for crimping the same upon the top of the bottles. Said head is carried by an upright rod B, guided and working in a standard or post C. A shelf or bottle-rest appliance D is connected with the post below the head and a suitable guide E arranged therewith for centering the bottle beneath the collar-opening to the capping-on devices. Said machine parts may be of well-known construction and the head A operated in the usual manner.

The feeder mechanism comprises a receptacle or hopper for containing the supply of crown bottle-stoppers or articles to be sorted and fed to the affixing-machine, a chute or guideway for directing the same to the place of affixment or use, and means for automatically selecting, separating, or arranging the fed articles for delivery in ample numbers and in uniformly-disposed order, said means embodying the features of invention and operative organization, which I will proceed to describe in detail.

The hopper or receptacle F, into which the crown bottle-stoppers or articles to be selected and fed are deposited in a promiscuously-mingled mass, is in accordance with my invention provided with a circular body casing or frame F', arranged with the plane of the circle in substantially upright position and embracing therein a separator way, chamber, or space I for the orderly assembling and disposal of the crown-stoppers or disks therein on their way to the exit-passage. Said separator-way is preferably formed by certain annular offsets and flanges integral with the body of the hopper. A circular opening 2 leads from the hopper-basin into said separator-way I. Within said chamber and forming a back inclosure for the hopper I provide a movable plate G, preferably mounted on an axis stud or journal 3 in a bearing-hub 4,



supported by a spider-frame or suitably attached to the back of the hopper-body. The plate G is disposed with its front face in such relation to the annular wall or flange *f* of the hopper-body that the intervening space or way will be slightly greater than the thickness of the crowns or disks or so that such crowns or disks can easily pass between the surfaces in single edgewise upright position, but cannot enter diskwise nor in dual edgewise condition, as two laid flatwise together.

The separator-way I includes a primary channel 5 and a secondary channel 6, disposed for the assembling of the crowns in two series between the stationary wall and the movable plate G, the cross-sectional shape and relative arrangement of the parts being preferably as shown in Figs. 4, 5, and 8. The stationary or body part F' has an upright face plane *f*, terminating at an abrupt angle, offset, or ledge 7, and beyond which there is an inclined surface 9. These form one wall of the separator-way. From the circular space there is a passage-way 8, through which the crowns find exit into the chute or runway-conduit H. Said passage-way is of a dimension that will pass the crowns or disks only in single successive order. The offset or ledge 7 is made of a form suitable to interrupt the flow of crowns and give lodgment to all inwardly-facing crowns, but to allow outwardly-facing crowns to slide past without becoming arrested or lodged therein. The basin of the hopper is formed in such shape, preferably with a partially-spherical bottom and incline 14, that the contents will slide downward against the plate G and fall into the space I, where they assume an approximately edgewise upright position and in either front-facing or rear-facing order; but only those which face in a predetermined direction can pass into the runway-conduit.

The separator-plate G is formed with a hollow or recessed central portion 10, a face-plane surface 11, joining with the central surface by an incline 12 and outwardly with an inclined or offset rim-surface 13, that inclines backwardly from said face-plane surface. The depth of the recess 10 in the face of the plate is best made approximately the same as the width of the separator-channel or somewhat greater than the thickness of the crowns or disks to be acted upon, and the forward incline 12 is disposed somewhat below the relative level of the inclined bottom 14 of the hopper where it meets the upright face plane of the separator-way channel. The effect of this form and relation is that the crowns or disks are caused to readily slide down the hopper-bottom and when meeting the opposite incline 12 are given an increased tendency to turn downward or assume an edgewise upright position and fall into the narrow part of the annular space, so that they will be readily supplied to the delivery-chute. In the face-recess of the plate I provide one or more humps 15 or portions where the face

plane is widened toward the axis, making an offset in the curvature of the incline 12, the purpose of which is hereinafter explained. Combined with the plate I provide means for elevating the crowns or disks upward in the separator-way. This means preferably consists of a stud or finger 16, protruding through an opening into the separator way and carrier by a spring 17, secured on the back of the plate. (See Figs. 2 and 5.) Other forms of elevating means may in some instances be employed.

The runway or chute H is made of sufficient length to afford gravity feed movement for the crown-stoppers or articles to pass there-through, and its lower end is curved in a manner to lead into the throatway-guard K of a bottle-capping machine or to the required position of feed-delivery, where the articles are presented in regular arranged position and successive order. The peculiar construction of the delivery end of the runway and the manner of combining the same with the throatway of the cap-affixing mechanism may be of ordinary or any suitable construction; but I have devised a peculiar improved collar and connection therefor which forms the subject-matter of a separate application for Letters Patent.

M indicates the actuating-rod, arranged to slide endwise through guide-bearings 18 and 19 and carrying a rack 20, that meshes with a pinion 21, fixed on the back of the plate G. The lower part of the rod is secured in a bracket-ear 23, fixed to the side of the bottle-stoppering post or frame C. Cushioning-springs 22 and 24 are preferably arranged on said rod above and below the bracket-ear, as illustrated, which springs are of sufficient tension to carry the power for moving the oscillating plate, but act to prevent or reduce shock and jar on the mechanism when changing the direction of movement, thus making a smoother-running mechanism. A spring 25 is connected with the lifter or rod at 26 and with the bearing or projection 18, which is fixed to the chute H. Said spring serves as lifting force for counterbalancing the weight of the feeder mechanism in relation to the bottle-stoppering machine and renders the operation somewhat easier than it otherwise would be. While the spring 25 is a desirable adjunct, the mechanism would not be rendered inoperative nor its mode of operation materially changed by the omission of said spring.

For attaching the feeder mechanism to the bottling machine-head I preferably provide a circular or crescent shaped jaw or clamp P, rigidly secured to the side of the chute H and adapted to embrace the head-attaching hub *a*, that is fixed to the top end of the rod B. Said clamp-jaw is provided with a set-screw 27 for tightening it upon the hub *a*, as indicated. The ends of the jaw are best connected by an upwardly-offset tie 28, that straddles the arm 29 and prevents spreading of the crescent clamp-jaw. The lower end of the chute is rig-



idly connected by screws 30 with the guide-collar K on the lower end of the capping-head A. Thus the chute and hopper are arranged to move up and down with the reciprocal motion of the capping-head.

The collar K is provided with a projecting horn or positioning-finger 31, that contacts with or stands adjacent to the side of the guiding-boss 32 on the head A and serves as a guide when adjusting the feeder to the machine and for the correct positioning of the feeder in relation to the machine-head. The lower end of the collar K is suitably attached to the head-cylinder, as indicated.

The movable plate G in the present instance works with a rotary oscillating movement of about two-thirds revolution back and forth; but if in any instance desired it can be made for continued rotation in one direction and operated by a pawl and ratchet such as heretofore employed for imparting intermittent rotary motion in machinery.

The front surface or flange *f* of the hopper-body below the basin and the rim 13 of the plate G may, if so desired, be perforated or made as open-work grills, so that the movement of the crowns within the separator-way can be observed from the exterior.

The operation is as follows: As the hopper and chute are supported in connection with the head A and the rod M is held in connection with the stationary post, frame, or standard C, reciprocation of the machine-head effects relative reciprocatory movement between the rod M and hopper F, and the rack 20 and pinions 21 cause rotary action or movement of the separator-plate G. The crown-stoppers or articles to be fed to the machine are poured into the hopper-receptacle F and slide down against the plate G, the incline 12 of which tends to turn and direct them into the primary channel 5 of the separator-way I, where they assume in single row an edgewise upright position. Those that are facing in the wrong direction become arrested or lodged upon the offset or ledge 7, (see Fig. 6,) while those that are facing in the right direction slide from said ledge into the secondary channel 6 and eventually by turn of the plate roll to the exit passage-way 8 and successively fall into the chute in proper order to be carried by gravity to the guide-collar K and take position therein ready to be received upon the top of the bottle R and clenched thereon by the cap-setting die or appliances when the machine-head is depressed in well-known manner.

In Fig. 8 the disks or crown-stoppers are indicated by dotted lines at S and S', those facing in the wrong direction, S', being arrested by the ledge or offset 7 for return to the hopper, and those facing in right direction, S, being in position to pass down the chute. The wrongly-facing crowns that become arrested within the annular way are by the rotative movement of the plate and the action of the elevating means 16 carried

to the upper part of the circular way and permitted to fall out from beneath the flange *f* into the general mass within the hopper, there to turn over and again slide down to the face of the plate G, the operation thus continuing while the machine is at work and the hopper has a supply of crown-stoppers therein. The hump 15 as the plate rotates or oscillates agitates the crowns that lie adjacent to the inner face of the plate and acts to separate and release crowns that have become nested together and to turn the crowns or change their position. This agitation is local or near the plate-surface and does not, therefore, extend to scratch or injure the crowns in mass, as would occur by a general agitation of the mass within the hopper.

In some instances it may be desired to merely automatically arrange the crowns or disks in successive single flatwise order without reference to their direction of facing in either direction. The modification shown in Fig. 9 illustrates a construction in which the separator way and plate G is so formed that the crowns or disks will be assembled in flatwise order and passed through the exit without regard to their direction in facing. In this modification the movable plate has the recessed face and the inclined step 12; but the outer backwardly-inclined rim-face is omitted and the face-plane 11 extended to the peripheral edge of the plate, also the exit passage-way 8 leads from the ledge or offset shoulder 7 of the annular channel or space I.

In Fig. 10 I have shown a modification in which the selected crowns or disks are taken from the primary channel instead of the secondary channel and in which the means for returning the wrongly-facing crowns is arranged to have its movement distinct from that of the separator-plate, said means consisting of a finger or fingers 116, passing around the edge of the plate and the ends thereof traversing within the annular channel within which the crowns assume their edgewise reversely-facing position. As shown in Fig. 10, the plate G and returner-fingers are arranged for independent rotary or oscillative movement about a common axis. The rod M is connected with the hub of the plate by a crank 33 for imparting a swing or oscillative motion thereto, while it is combined with the hub of the returner-finger arms 116 by a pawl 34 and ratchet 35 for imparting to said arms an intermittent continued revoluble motion, so that the finger ends 116 traverse the annular channel 6, causing the crowns or disks therein to become elevated to the top of the circle, where they fall back into the hopper F and assume new position. In the modification shown in Fig. 10 the bearing 4 for supporting the journal 3 of the separator-plate G is disposed inside of the hopper, an arrangement which in some respects is not as desirable as to have it at the exterior. The exit passage-way 8 leads from the offset or intermediary ledge. The separation of op-



positely-facing crowns or disks is effected by the passing of those rightly faced to the chute and the return of those wrongly faced into the hopper from the secondary channel by the continued movement of the elevating devices.

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

1. In combination, a hopper comprising the receptacle and a body-casing having a circular chamber disposed in upright relation and forming one wall of a separator-way, provided with flat and conical crown-supporting surfaces and an offset adapted for the lodgment of crowns or disks facing in one direction while permitting those facing in the other direction to pass said offset, a movable plate forming one wall of said separator-way with opposing flat and conical crown-supporting surfaces, an exit-passage radially from said separator-way for the non-interrupted crowns or disks, a directing-chute, and means for moving said plate.

2. In a machine for the purpose specified, a separator-way between opposite supporting-surfaces that admit the crowns in single flatwise order, said separator-way comprising a primary annular channel and a secondary annular channel having the circle thereof disposed approximately in edgewise upright position; with an intermediary offset or ledge that prevents the disks or crowns when facing in one direction, from passing from the primary to the secondary channel, while permitting the disks or crowns when facing in the opposite direction to pass into said secondary channel, the exit-passage and the chute.

3. In a feeder mechanism of the class described, the combination, of the hopper-receptacle, a hopper-body having an annular separator-way including a primary channel, a secondary channel, and an arresting-offset, a movable plate or surface forming one wall of said separator-way, an exit passage-way leading from one of said channels, and means for elevating the contents of the other channel to reënter the hopper-receptacle.

4. In a bottle-stoppering machine of the class described, the combination, of a stationary frame, a movable head for securing the crown-stoppers or sealing-disks to the bottles, a chute secured to the movable head for conducting the crowns or sealing-disks to the throatway of the machine, a hopper mounted on said chute, comprising a supply-receptacle, a circular chamber or separator-way opening therefrom, a crown-arresting ledge or offset, and a passway into said chute, a movable plate arranged in said circular chamber and forming one wall of a separator-way adapted for separating the oppositely-facing crowns, an actuating-rod secured to the stationary machine-frame, and operating connections for moving said plate by said rod.

5. In a feed mechanism for crown bottle-

stoppers, a hopper provided with a circular arranging-channel in which the crowns or disks assume single flatwise upright positions, a rotatable plate, the surface of which forms one wall of said channel, said plate having its face centrally recessed, and provided with an outwardly-flared incline 12 facing the interior of the hopper and directing the crowns to said channel, substantially as set forth.

6. The combination with the hopper-body having the circular-chamber separator-way I, with a flanged face-plane *f*, and an offset 7, and the hopper-receptacle delivering through an opening thereinto; of the pivoted movable plate inclosing said chamber and provided with the opposite face-plane surface 11, the central-recess 10 and inclined rim-surface 13, formed substantially as set forth.

7. The combination, substantially as described, of the hopper having the edgewise upright circular separator-way, the rotatably-movable plate forming one side of separator-way, a spider-frame with bearing-hub attached to said hopper, the axis-shaft of said plate supported in said bearing-hub, a pinion fixed to said plate, the actuating-rod, and the toothed rack carried by said rod and engaging said pinion, for the purposes set forth.

8. In a mechanism for arranging and feeding bottle-stopper crowns or disks, a hopper-receptacle having a side opening and an upright annulus of wall-surface about said opening, a movable plate guardingsaid opening and presenting an opposite parallel annular face or wall, a separator-way comprised between said annular surfaces or walls, said hopper having an inclined bottom, and said movable plate provided with an inclined surface leading down to said separator-way, the inclines on the opposite parts being disposed at different levels, substantially as and for the purpose set forth.

9. In combination with the hopper having the opening in the side thereof, and the annular chamber; of the axially-supported movable plate inclosing one side of said chamber, said plate having a recessed center, a face-plane surface, and an inclined surface about said recess, the circle or contour of said inclined surface being interrupted by an offset or hump, for the purpose set forth.

10. The combination, with the hopper-body, and the centrally-pivoted plate having the annular separator-way between their opposite faces, for the edgewise assembling of the crown-stoppers in oppositely-facing series; of a spring secured to the back of said plate and a stud fixed to the free end of said spring and extending through an opening in the plate, and presenting a rounded end within said separator-way, for the purpose set forth.

11. In a feed mechanism for bottle-stoppering machines, the combination, with the hopper, separator devices, and the delivery-chute, supported upon the bottling-machine head,



and the actuating-rod supported upon a stationary part of the machine; of the suspending-spring 25 connected at its respective ends with the feeder-chute body, and with said rod, and exerting force in opposition to the gravity of the feed-hopper and appurtenant parts, substantially as set forth.

12. In combination with the hopper and chute secured to the machine-head, the rotatable separator-plate axially supported in connection with said hopper, and means for oscillating said plate; of the plate-actuating rod, a bracket or eye-plate secured to the stationary part of the machine and serving as a guide for said rod, and cushioning-springs for said rod, arranged above and below said bracket, substantially as set forth.

13. In mechanism for the purpose specified, the combination, with the feed-hopper, and chute extending therefrom; of an attaching-clamp fixed to said chute, and comprising a circular or crescent-shaped jaw P having an upwardly-offset tie 28 uniting the ends thereof, said clamp adapted for surrounding the supporting-hub at the top of the rod, and overbridging the arm that carries the stoppering-machine head; and a clamp-screw or means for tightening said clamp upon the hub, substantially as set forth.

14. In a machine for the purposes specified, a collar provided with a positioning horn or finger adapted for contact against a part of the head; in combination with the bottle-stoppering head, the feed-delivery chute attached to said collar, and a supporting-clamp whereby the chute and feed-hoppers are car-

ried upon the bottle-stoppering machine, substantially as set forth.

15. In a machine for the purpose specified, in combination, a hopper-receptacle comprising a circular uprightly-disposed casing and a back plate inclosing a separator-way into which the crown-stoppers or sealing-caps gravitate from said receptacle, and presenting opposed supporting-surfaces between which the crowns or sealing-caps are admitted to assemble in single flatwise order, said separator-way provided with an exit-passage, and means for arresting, for return to the receptacle, such crowns or sealing-caps as face in one direction, while permitting those facing in the other direction to go through the exit-passage.

16. In mechanism for the purpose specified, a hopper-receptacle, an adjoining annular separator-way disposed in edgewise upright relation thereto, and into which the crowns or sealing-caps pass from the receptacle and are caused to assume edgewise upright positions in single order therein, an exit-passage leading from said separator-way, and means for detaining the crowns or sealing-caps that enter said separator-way facing in one direction while permitting the crowns or sealing-caps that enter facing in the other direction to descend through the exit-passage.

Witness my hand this 12th day of April, 1901.

FRANK O. WOODLAND.

Witnesses:

CHAS. H. BURLEIGH,  
ELLA P. BLENUS.