No. 612,865. Patented Oct. 25, 1898.

N. MUSLAR.

FEED DEVICE FOR BOTTLE STOPPERING MACHINES.

(Application filed Mar. 10, 1898.)

(No Model.) 3 Sheets—Sheet 1.

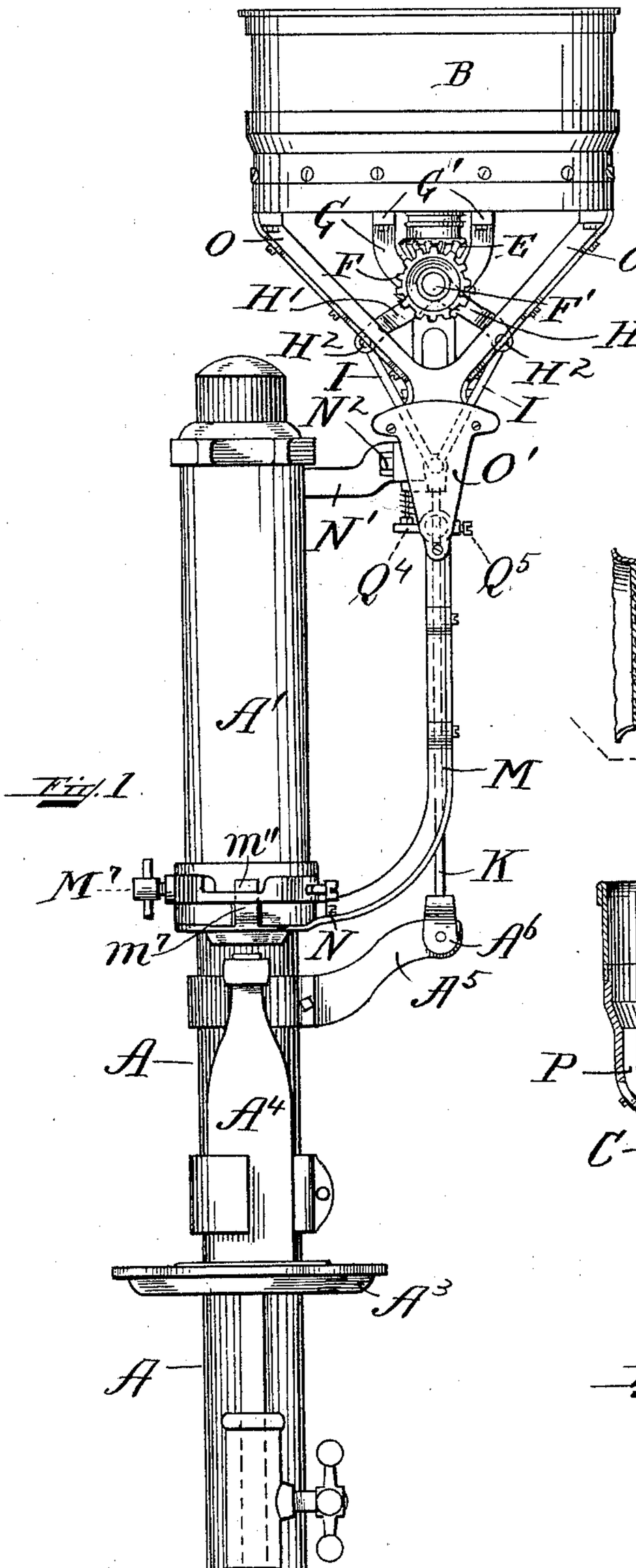

Fig. 1.

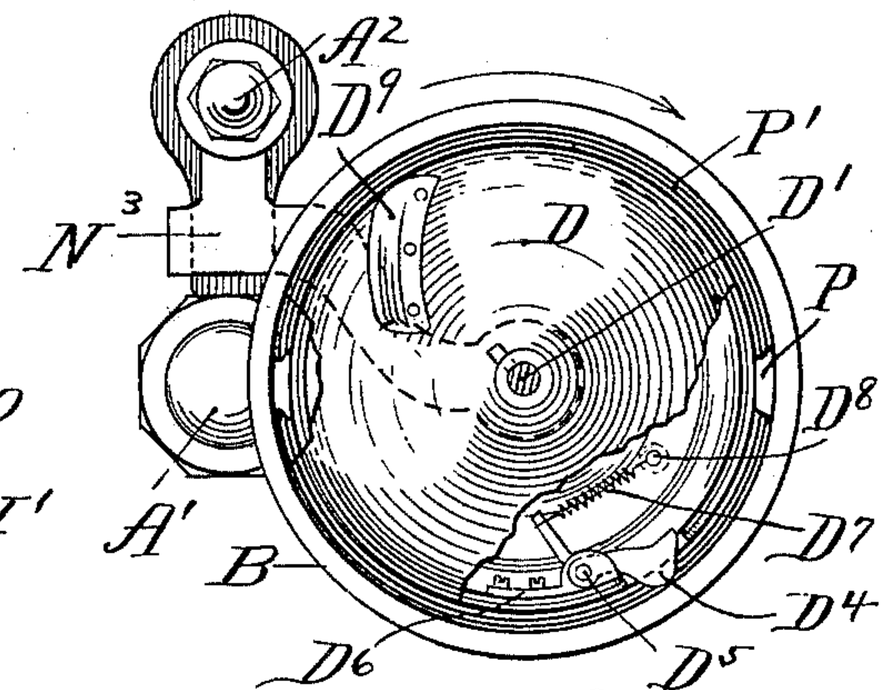

Fig. 2.

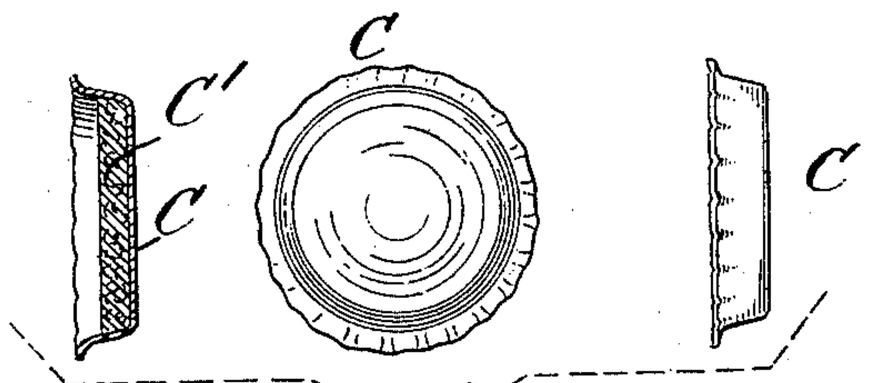

Fig. 3.

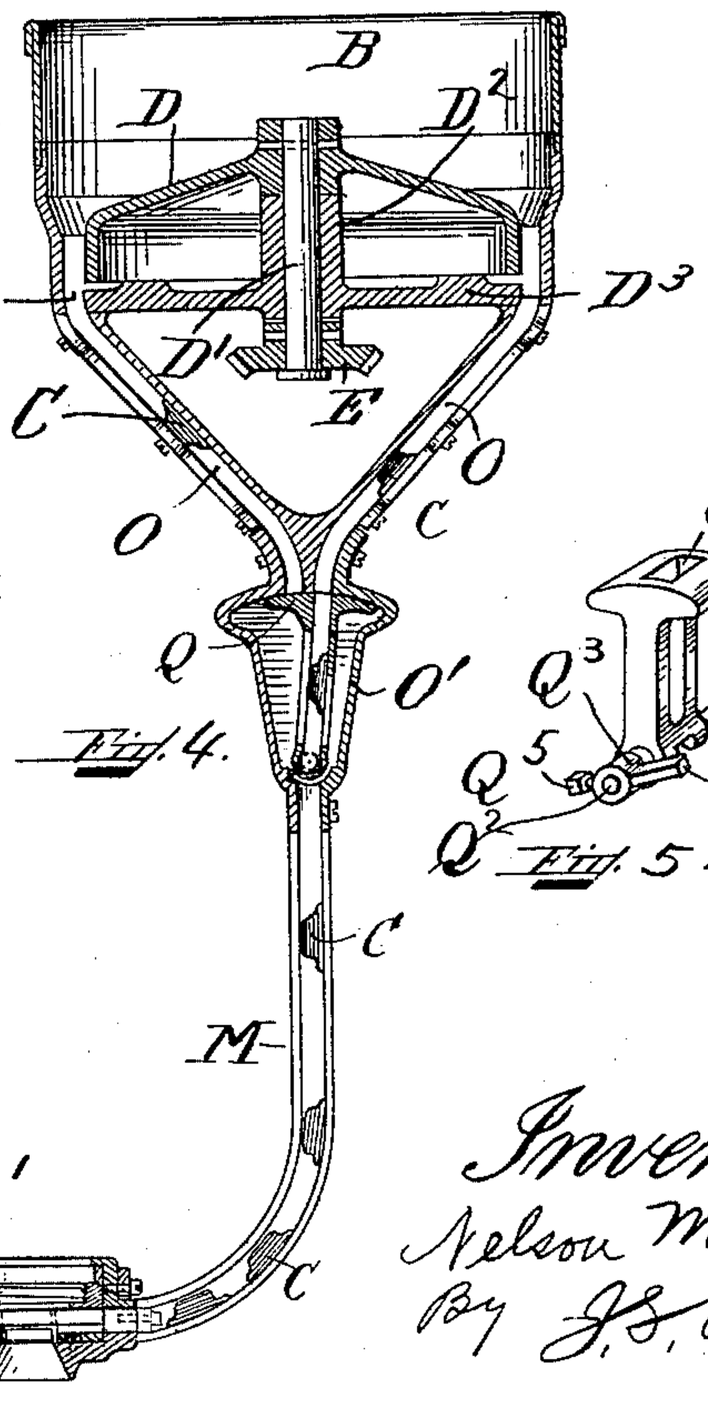

Fig. 4.

Fig. 5.

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No. 612,865. Patented Oct. 25, 1898.

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FEED DEVICE FOR BOTTLE STOPPERING MACHINES.

(Application filed Mar. 10, 1898.)

(No Model.) 3 Sheets—Sheet 2.

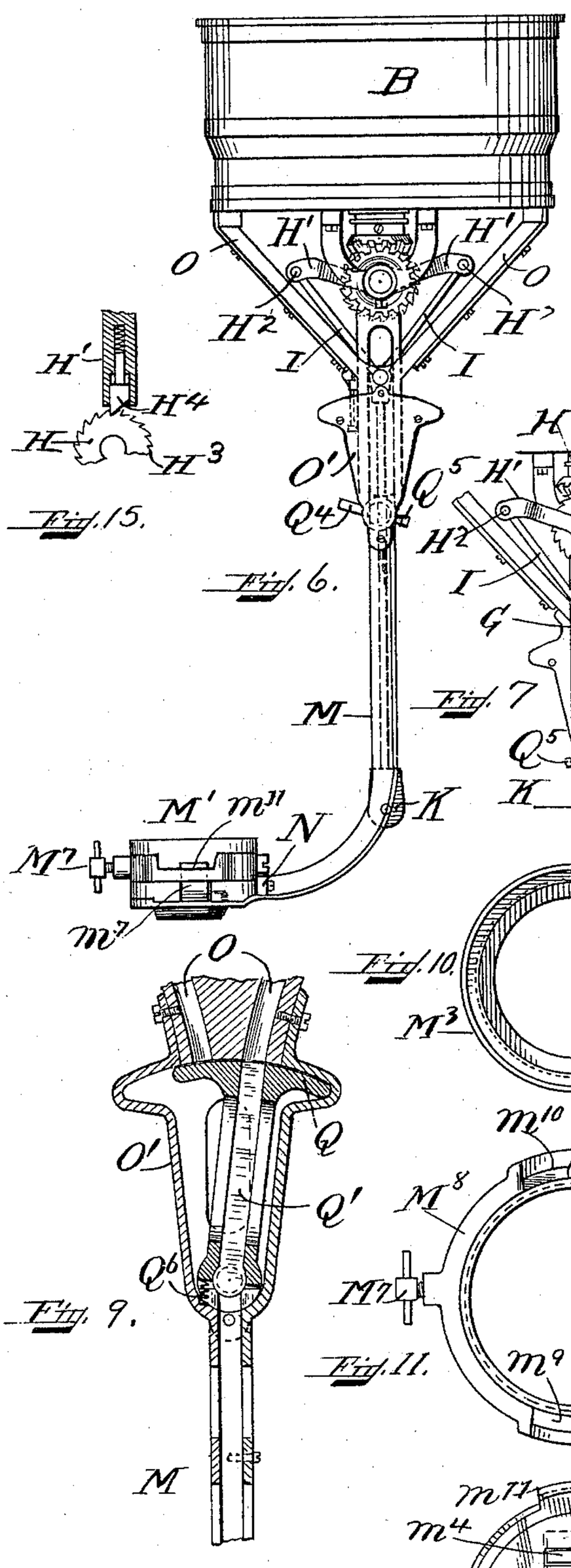

Fig. 15. Fig. 6.

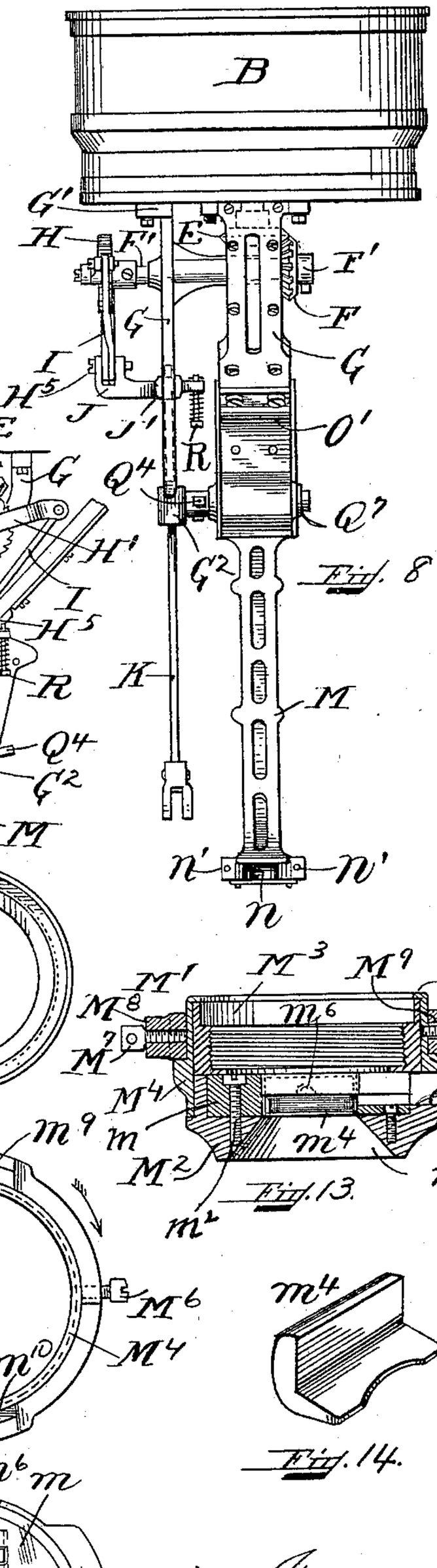

Fig. 7. Fig. 8.

Fig. 9.

Fig. 10.

Fig. 13.

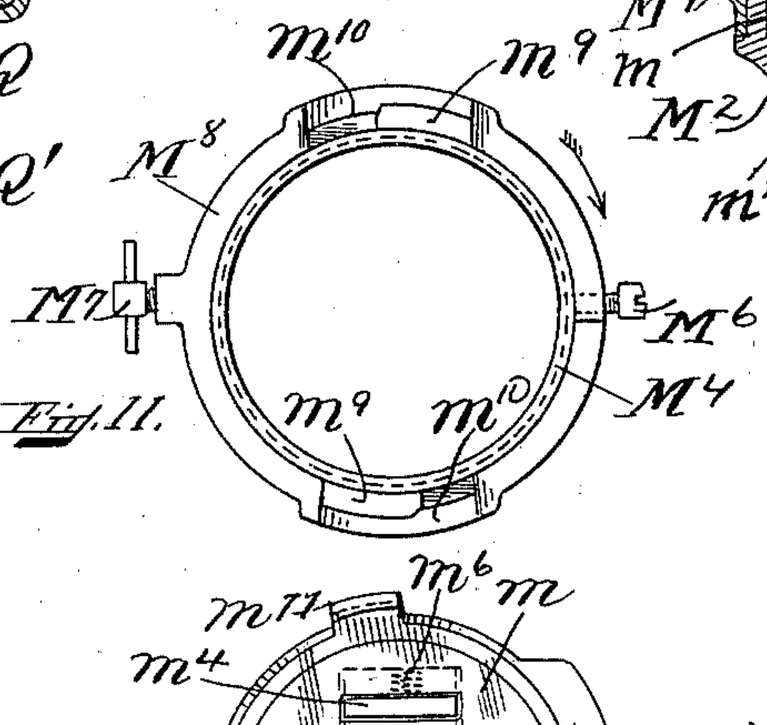

Fig. 11.

Fig. 14.

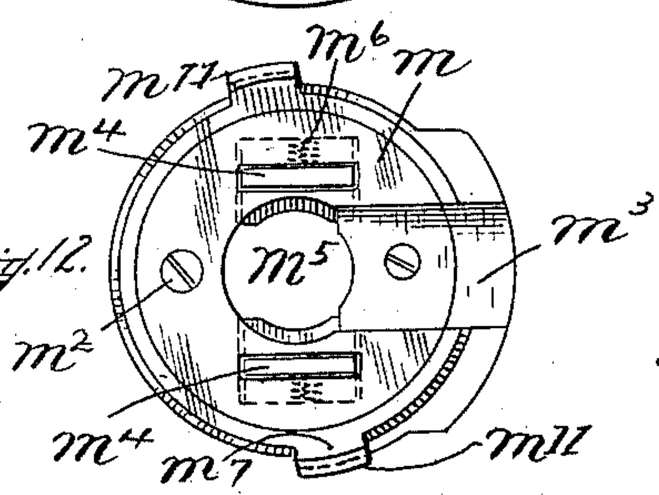

Fig. 12.

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No. 612,865. Patented Oct. 25, 1898.

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FEED DEVICE FOR BOTTLE STOPPERING MACHINES.

(Application filed Mar. 10, 1898.)

(No Model.) 3 Sheets—Sheet 3.

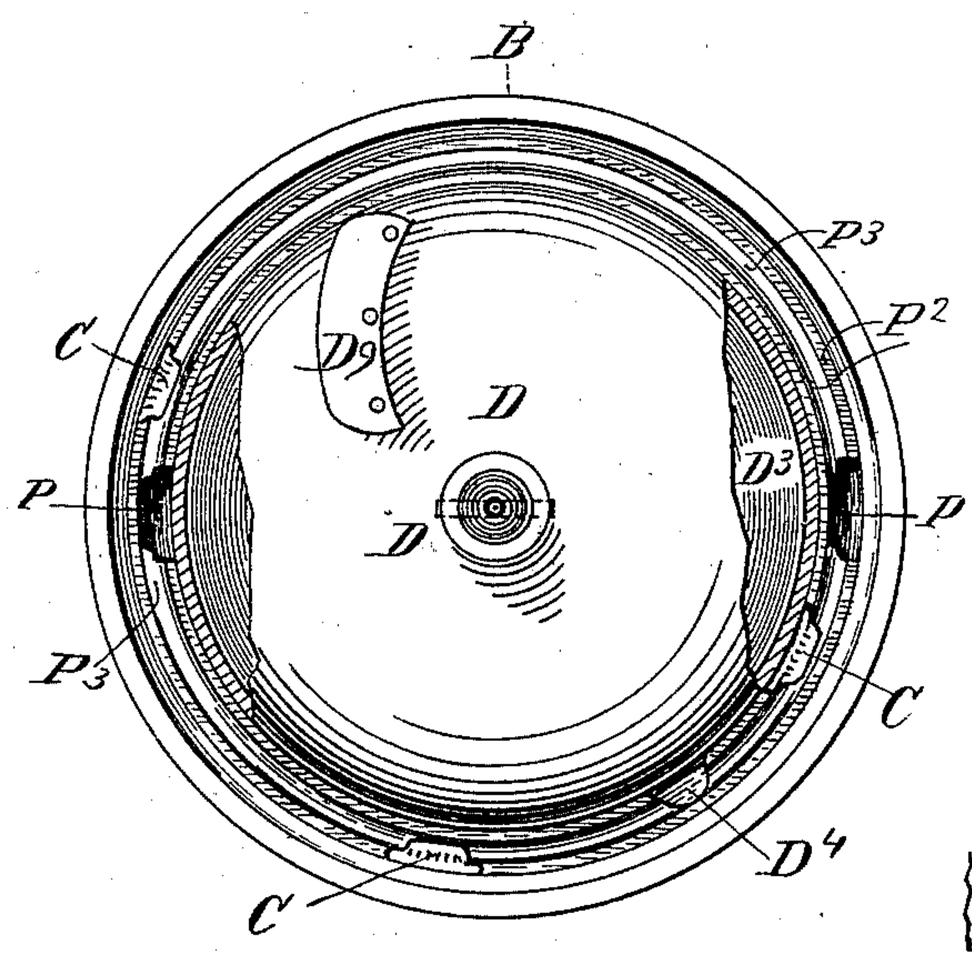

Fig. 16.

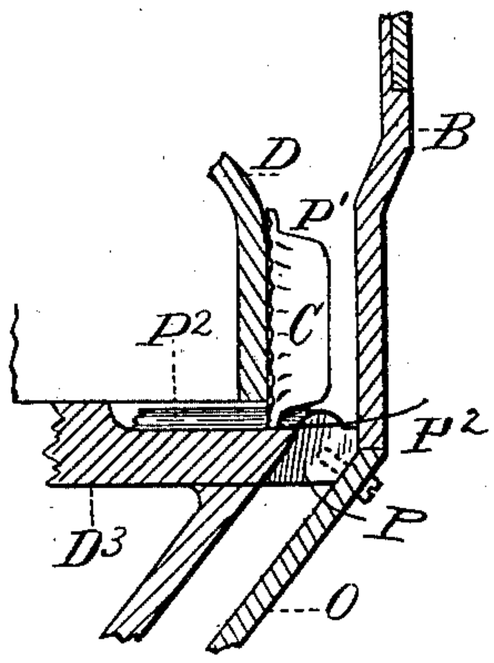

Fig. 18.

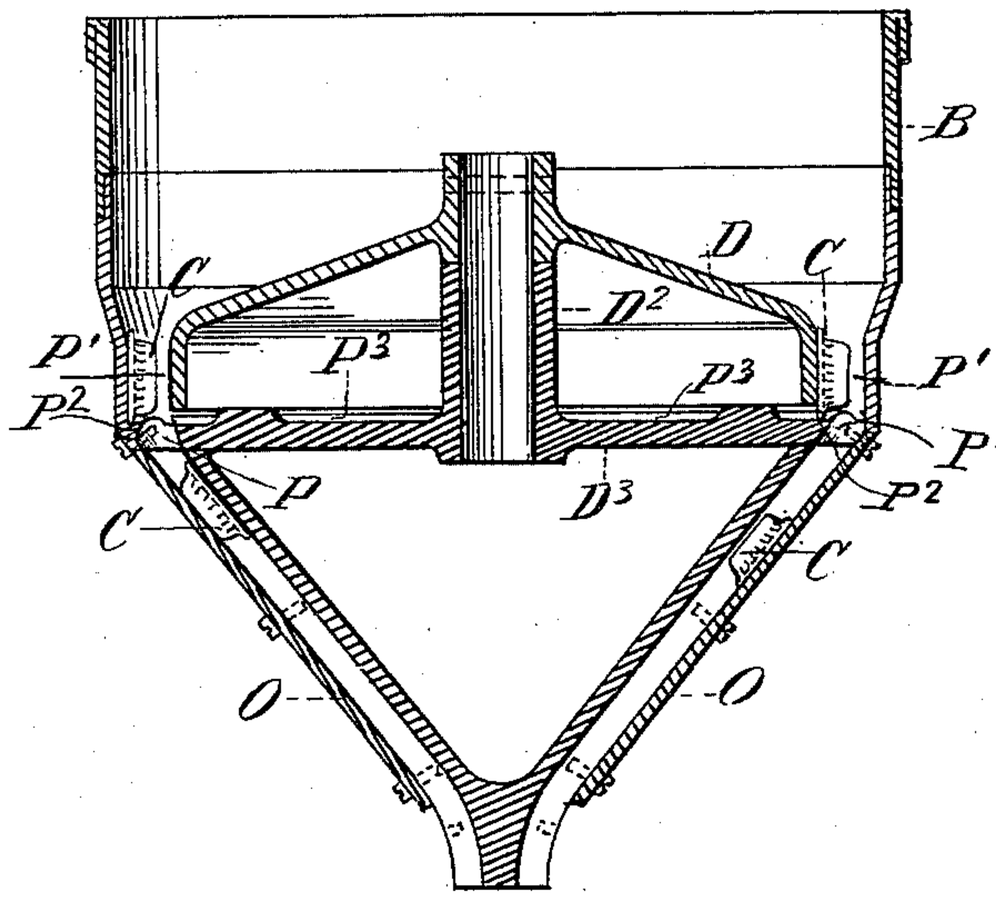

Fig. 17.

Witnesses:
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Inventor:
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UNITED STATES PATENT OFFICE.

NELSON MUSLAR, OF WEST BOYLSTON, MASSACHUSETTS, ASSIGNOR TO JOHN JOYCE, OF ANDOVER, MASSACHUSETTS.

FEED DEVICE FOR BOTTLE-STOPPERING MACHINES.

SPECIFICATION forming part of Letters Patent No. 612,865, dated October 25, 1898.

Application filed March 10, 1898. Serial No. 673,330. (No model.)

To all whom it may concern:

Be it known that I, NELSON MUSLAR, of West Boylston, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Feed Devices for Bottle-Stoppering Machines, of which the following is a specification.

My invention relates to improvements in feed mechanism for automatically feeding stoppers to the bottles to be capped in a bottle-stoppering machine.

The object of my invention is to deliver stoppers in a predetermined position from a suitable hopper and to feed the same, facing in one and the same direction, to the bottle-stoppering machine so that the stoppers always come over the top of the bottles to be capped in the same position, with the concave side facing the head of the bottles and adapted to fit around the upper edge of the head of the bottle in the operation of the capping mechanism.

My invention consists of certain novel features hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, which illustrate a construction embodying my invention, Figure 1 is a side view of a bottle-stopper-feeding mechanism and a portion of the bottle-stoppering machine to show the relation of the feeding mechanism to the bottle-stoppering machine. Fig. 2 is a plan view, partly broken away to show the friction device for agitating the stoppers in the hopper. Fig. 3 is a sectional plan and side elevation of the bottle-stoppers which are used for corking the bottles. Fig. 4 is a central cross-sectional view through the hopper branch chutes and main chute for feeding the bottle-stoppers to the bottle-stoppering machine. Fig. 5 is a detail perspective view of the swivel-guide for controlling the passage of the stoppers from the branch chutes into the main chute. Fig. 6 is a side view of the hopper and feeding mechanism, showing the position of the parts when the feeding mechanism is lowered during the capping operation. Fig. 7 is a detail view of the feeding mechanism, taken on the opposite side from that shown in Figs. 1 and 6. Fig. 8 is a front end view of the hopper and feeding mechanism and the fixed rod which guides the hopper and feeding mechanism in their vertical movements. Fig. 9 is a detail sectional view showing a portion of the main chute and the branch chutes with the swivel-guide for controlling the passage of bottle-stoppers from the branch chutes to the main chute. Figs. 10, 11, and 12 are plan views of three sections which constitute the centering-head, which is secured onto the operating-head of the bottle-stoppering machine and by which the bottle-stoppers are capped and clamped onto the heads of the bottles. Fig. 13 is an enlarged central longitudinal sectional view through the centering-head. Fig. 14 is a detail perspective view of one of the spring-pawls in the centering-head. Fig. 15 is an enlarged sectional view through part of one of the ratchet-wheels and its spring-pawl. Fig. 16 is an enlarged plan view, partly in section, of the hopper. Fig. 17 is an enlarged cross-sectional view of the hopper and branch chutes. Fig. 18 is an enlarged detail sectional view of part of the hopper and one of the branch chutes and showing a stopper facing in a direction adapted to pass down the opposite branch chute.

Like letters of reference refer to like parts throughout the several views.

The bottle-stoppering machine to which my invention is applied consists of a main frame or standard A and an operating-head A′ for capping the stoppers onto the bottles, and behind said head A′ is a vertically-operating shaft A^2, which passes down through the standard A and is operated by a suitable foot-treadle or other power, and A^3 represents a table on which the bottle A^4 rests in position to be capped.

In the practical operation of these well-known bottle-stoppering machines the shaft A^2 has a constant upward pressure imparted to it to hold it and the head A′, which is attached to and moves with it, in their highest normal positions, as shown in Fig. 1—that is, in the positions which said parts occupy preparatory to applying a stopper to one of the bottles on the table. In the application of said stopper to the bottle the shaft A^2 and the head A′ are moved down by pressure on the foot-treadle or other power connected therewith, so as to force the bottom of the head A′

down over the head of the bottle, which operation causes the head of the bottle to be capped by the stopper which is clamped thereon by the mechanism inside of the head A′. The foregoing mechanism constitutes no part of my invention, and it is not deemed necessary to illustrate and describe the same in detail, as the machines are upon the market and well known in trade, so that simply those parts which are necessary to show the relation of my invention to said machines are shown and described.

My invention is for the purpose of feeding automatically bottle-stoppers into the bottom of the head A′ over the heads of the bottles preparatory to capping and clamping, this latter operation being carried out by the bottle-stoppering machine independent of my invention, which relates, as previously stated, to the feed mechanism for the bottle-stoppers.

The hopper B, in which the bottle-stoppers C are placed, is provided with an inverted rotary cup-shaped disk D, centrally arranged and keyed on the vertical shaft D′, fitted to turn in the bearing D^2 on the bottom D^3 of the hopper, as shown in Fig. 4, and with the hub of said disk resting on the upper end of the hub, which forms the bearing D^2, in which the shaft D′ revolves. Upon the lower end of the vertical shaft D′ there is mounted the bevel-gear E, arranged to mesh with another bevel-gear F, mounted and secured on the short horizontal shaft F′, fitted to turn in a bearing on the frame G, which is secured at G′ to the under side of the hopper. On the outer end of the horizontal shaft F′ is mounted and secured a ratchet-wheel H, with which a double knuckle-jointed pawl device engages to turn the same and by means of the aforesaid connecting mechanism to rotate the disk D. This pawl device consists of two levers H′, each pivoted at its inner end to the outer end of the horizontal shaft F′ and extending outwardly in opposite directions and pivoted at their outer ends at H^2 to the upper ends of the connecting-rods I, which are in turn pivoted at their lower ends at H^5 to the outer end of the arm J, to which at J′ there is firmly secured the vertical fixed rod K, secured at A^6 to the fixed bearing A^5, secured around the standard A, as shown in Fig. 1. Over the said fixed vertical rod K the bearing G^2 of the frame G is fitted to slide in the upward and downward vertical movements of the hopper and feeding mechanism. Each lever H′ is provided with a spring-pawl H^4, (see Fig. 15,) which engages with the teeth H^3 of the ratchet-wheel H, and one of said pawls is adapted to engage with said teeth in the upward movement of said feeding mechanism to turn the ratchet-wheel, and the other spring-pawl engages with said teeth and turns the ratchet-wheel in the downward movement of the feeding mechanism, so that a continuous motion is imparted to the rotary disk D when the machine is in operation. The vertical rod K being secured and held stationary, as described, it will be understood that a direct connection is made from the stationary standard A through the said rod K, ratchet-wheel H, and gearing with the rotatable disk D of the hopper. Therefore with the rod K stationary the hopper and feeding mechanism must be lifted and lowered in order to operate the rotary disk D, and to provide for this vertical movement of the hopper and feeding mechanism the main chute M is connected directly to the operating-head A′ by screwing on said head A′ the centering-head M′, which is securely attached to the lower end of the main chute M by screws N passing through the holes n' in the lower end of the chute M, as shown in Figs. 1, 6, and 8, and also by means of the cross-rod N′, which is connected by the screws N^2 to the chamber O′, forming part of the main chute M and the branch chutes O, by the screws N^2, and the opposite end N^3 is connected to the vertically-operating shaft A^2. (See Fig. 2.) Consequently, by reason of these connections, when the operating-head A′ is operated the hopper and feeding mechanism are moved up and down with said head A′, and in said movement the levers H′ actuate the ratchet-wheel H, and the motion is communicated from the ratchet-wheel H through the gearing E and F to the rotary disk D.

The centering-head M′, which, as previously described, is secured to the lower end of the chute M, is composed of three distinct sections M^2, M^3, and M^4. (See Figs. 10, 11, 12, and 13.) The lower part M^2 is provided with a throat m^3, which registers with the mouth n at the lower end of the chute M, (see Figs. 4, 8, and 12,) and said throat terminates in the opening m^5, which is directly over the head of the bottle to be capped. Located in said section M^2 under the plate m are two spring-pawls m^4, held in place by the plate m, which is held by the screws m^2. The springs m^6, which act on the pawls m^4, are of equal strength, so that said pawls will yield equally as the bottle enters the centering-head M′, and thus center the bottle automatically with the centering-head.

The three sections are connected in the following manner: The section M^3 is slipped upwardly into the section M^4 until its upper edge reaches the inwardly-turned lip M^5 of the section M^4. The lower section M^2 is then connected to the above two sections by slipping the lugs m^7 of the section M^4 up through the openings m^9 (see Fig. 11) between the ring M^8 and the outer side of the section M^4, and then by turning the ring M^8 the projections m^{10} on said ring come under the lateral lugs m^{11} on the upper ends of the lugs m^7, and by this connection the three sections are secured together. The movement of the ring M^8 is limited by the screw M^6, screwed into the section M^4 and located in the slot M^9, and when the ring M^8 has been moved, as above described, the said set-screw M^7 is screwed

inwardly, so that the ring M^8 is firmly held in its adjusted position and all three sections are firmly secured together. When the centering-head M′ is secured onto the lower end of the head A′ by the threads in the section M^3, the mouth m^3 may not be in perfect alinement with the mouth n of the chute M, but the same may be moved around into alinement, because the inner section M^3 is not rigidly secured to either the section M^2 or M^4, but is simply in frictional engagement with the inner surface of the section M^4, so that the section M^2 and the section M^4 can be slipped around the inner section M^3 until the mouth m^3 comes into alinement with the mouth n of the chute M, when the lower end of the chute M may be screwed to the centering-head M′ by the screws N. This construction thereby provides a simple and easy means of alining the centering-head with the end of the chute M.

From the centering-head M′ the main chute M extends upwardly to a point under about the center of the hopper, where it branches off to the opposite sides of said hopper, and the branch chutes O are attached to the bottom of the hopper in any suitable manner. In alinement with the upper terminals of the upper branch chutes O are formed openings P in the bottom of the hopper, (see Figs. 2 and 16,) through which the stoppers pass from said hopper into said branch chutes and then down through the swivel-guide Q and the main chute M through the throat m^3 into the centering-head M′ and over the spring-pawls m^4, where the stoppers rest in position to be capped and clamped onto the head of the bottle on the table A^3 by the downward movement of the operating-head A′.

It will be understood from the drawings that the openings P in the bottom of the hopper are formed alike and arranged in the same relative position—that is, said openings are formed and arranged so that all the stoppers will pass from the hopper in a predetermined position, entering the centering-head M′ in their proper positions, with the upper or convex side up ready for the stoppering operation. As the stoppers are discharged from the two branch chutes O into the single main chute M, I have provided the swivel-guide Q to direct the stoppers first from one branch chute and then from the other into the main chute. This guide is provided with a vertical slot Q′, through which the stoppers move when passing from the branch chutes to the main chute. At its lower end on opposite sides the swivel-guide is provided with trunnions Q^2, which have bearings Q^7 in the sides of the chamber O′. As shown in Figs. 5 and 9, the under side of the lower portion of said swivel-guide is cut away, so as to present a flat surface, and against said flat surface the spring Q^6 in the chamber O′ bears and holds said swivel-guide in the position shown in Fig. 9, so that when in said position the stoppers from the right-hand branch chute pass through the swivel-guide into the main chute. As the hopper and its coöperating parts move upwardly with the operating-head A′ the spring-controlled finger R on the inner end of the arm J comes in contact (see Fig. 1) with the finger Q^4, extending from one side of the collar Q^3, which is held in its position on the trunnion Q^2 by a set-screw Q^5, and moves the swivel-guide Q from the position shown in Fig. 9 and brings the slot Q′ of said guide into alinement with the left-hand branch chute O, so that the stoppers from the last-mentioned branch chute pass through the slot Q′ into the main chute M. From the above it will be understood that by this arrangement means are provided whereby the stoppers alternately pass from the branch chutes into the main chute.

By journaling the swivel-guide at its extreme lower end it is obvious that only a slight motion of its lower end takes place as the upper end moves into alinement with the opposite chutes O, and consequently, owing to the small amount of motion at the lower end of the swivel-guide, the slot Q′ is kept in perfect alinement with the chute M in the above positions of the swivel-guide.

To assist the stoppers being moved around in the hopper, I have provided a flange D^9, which agitates the stoppers, and the finger D^4, which projects through the slot in the side of the disk into the channel P′ in the bottom of the hopper and causes the movement of the stoppers in said channel. This finger is pivoted at D^5 to one side of the disk on the supporting-piece D^6, secured to the side of the disk, and the spring D^7, secured at one end to the other end of the finger D^4 and fastened at D^8 to the under side of the disk, will yield when necessary and not dent or otherwise injure the stoppers.

As the hopper is filled with stoppers and the disk rotates the stoppers are kept in motion in the hopper, so that first one stopper and then another will be moved into position to enter one or the other of the openings P to pass into the branch chutes O. The branch chutes are more or less filled all the time, according to the rapidity with which the stoppers are discharged from the hopper, and the rapidity of discharge is regulated to some extent by the positions which said stoppers occupy in the hopper. For example, if a stopper after being moved around by the disk D comes over the discharge-opening B in a reverse position to that which it should occupy in order to pass through said opening it will be pushed along by the next stopper, and so on for each successive stopper until one arrives at the opening in the proper position to pass through. The stopper coming over the opening P in the wrong position will not pass through, but, being moved along by the stopper behind it, it is moved around from one side of the hopper to the other into a proper position to pass through the opposite opening P. Consequently no stopper can pass

around more than one revolution of the disk without passing out after it has reached the bottom of the hopper between the lower edge of the disk and the side of the hopper.

If the right-hand branch chutes be full of stoppers and the swivel-guide is held from turning by one of the stoppers of the series passing only partially into the slot Q′, the spring-finger R, coming in contact with the finger Q^4, will not move said finger down, but will yield and move upwardly through the opening in the end of the arm J, and this yielding of the spring-finger prevents the jamming of the device and of the stoppers, and this operation will continue until the obstructing stopper has passed fully into the slot Q′, and in this case upon the upward movement of the hopper the spring-finger R will turn the swivel-guide Q so that the slot Q′ will register with the left-hand branch chute O. If a stopper should occupy the same position in the left-hand branch chute and hold the swivel-guide Q over on the left-hand side of the chamber O′, the spring Q^6 will remain compressed until the stopper has passed into the slot Q′, in which case the spring Q^6 will throw the swivel-guide into the position shown in Fig. 9.

Referring to Figs. 16, 17, and 18, it will be seen that the bed forming the bottom of the channel P′ is oval in shape, as shown at P^3, and is somewhat wider than the width of the bottle-stoppers, and by making said bed wider than the stoppers the openings P can be made and at the same time leave an edge P^2 on the side of the openings entering the branch chutes. As the stoppers fall into the channel P′ they pass in one or the other direction, some facing outwardly away from the disk and others facing inwardly toward the disk. (See Fig. 17.) The face of the stopper is understood to be that part which is open and in which the cork C′ is located.

As the stoppers fall into the channel P′ the edges of the stoppers strike the oval bed and move toward and down into the inclined sides of the oval bed, facing in one or the other direction. Owing to the rotation of the disk D the stoppers in the channel P′ are kept in motion, and those which are adapted to pass down one opening will upon reaching said opening pass down into one of the branch chutes O, and those which face in the other direction will move around and pass down the opposite branch chute O. For instance, the stopper shown in Fig. 18 is not adapted to pass down the right-hand branch chute shown in said figure, but upon moving around the channel P′ it will pass down the left-hand branch chute shown in Figs. 16 and 17. The oval bed therefore causes the stoppers as the edges thereof strike the bed to move inwardly or outwardly from the top of the oval and those which face inwardly, as shown in Fig. 18 and on the right-hand side of Figs. 16 and 17, will move around and pass down the left-hand chute O, (see Fig. 17,) and those which face outwardly in the channel P′, as shown on the left-hand side of Figs. 16 and 17, will move around and pass down the right-hand chute O, as will be obvious by looking at Figs. 16 and 17, and observing that the stopper C shown on the left-hand side will come directly over the opening to the branch chute O on the right-hand side and face away from the disk D and pass down the right-hand chute O, while the stopper C shown on the right-hand side of Figs. 16 and 17, facing inwardly toward the disk D, will move around and pass down into the left-hand chute O. By this arrangement it is obvious that the stoppers which do not belong to the right-hand chute will not drop part way into the openings P, to which they do not belong, thus closing the openings and thereby prevent other stoppers belonging to said chute from passing down.

In brief, the operation is as follows: The head A′ being moved up and down in a manner similar to that common in all bottle-stoppering machines will carry with it up and down the hopper and feeding mechanism, and in this operation the rod K remaining stationary causes the pivoted levers H′ and rods I to be operated, thereby turning the ratchet-wheel H, gear-wheels, and rotary disk D, as hereinbefore described, thereby causing the stoppers to pass from the hopper through the branch chutes into the main chute and thus into the centering-head and over the bottles to be stoppered, as previously described, so that the operation is automatic and continuous.

I do not limit myself to the arrangement and construction shown, as the same may be varied without departing from the spirit of my invention.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a feed device for bottle-stoppering machines, an operating-head for capping the stoppers on the bottles, a hopper for holding said stoppers, a main chute through which the bottle-stoppers pass to said head, branch chutes between said hopper and main chute, openings in said hopper registering with said branch chutes, a disk within said hopper for keeping said stoppers in motion to bring them over said openings, mechanism for operating said disk, a swivel-guide at the junction of said branch chutes for controlling the passage of said stoppers from said branch chutes into said main chute, means for holding said swivel-guide in alinement with one of said branch chutes, a finger on said swivel-guide, and a spring-controlled finger adapted to contact with said finger on the swivel-guide to move the swivel-guide from said alinement and into alinement with another branch chute.

2. In a feed device for bottle-stoppering machines, an operating-head for capping the stoppers on the bottles, a hopper for holding said bottle-stoppers, a rotary disk located in

said hopper for keeping said bottle-stoppers in motion, a channel between the edge of the disk and the hopper into which the bottle-stoppers are adapted to drop, and branch chutes leading from said hopper, the bottom of said channel having its upper surface oval in shape in order that stoppers dropping into said channel will move to the inner or outer side of said channel.

3. In a feed device for bottle-stoppering machines, an operating-head for capping the stoppers on the bottles, a hopper for holding said bottle-stoppers, a chute for delivering stoppers from said hopper, a centering-head secured to said operating-head and to the end of said chute and consisting of an upper section, an inner section within said upper section and secured to the operating-head, a lower section provided with spring-pawls adapted to support the bottle-stoppers in position and to yield upon the insertion of the head of the bottle and to center said bottle as it enters the centering-head, and means for securing the three sections together.

4. In a feed device for bottle-stoppering machines, an operating-head for capping the stoppers on the bottles, a hopper for holding the bottle-stoppers, a chute for delivering stoppers from said hopper, a centering-head secured to said operating-head and to the end of said chute and consisting of an upper section, an inner section within said upper section and secured to the operating-head, a lower section provided with spring-pawls for centering the bottle as it enters the centering-head, and a movable ring around the upper section for securing the three sections together.

5. In a feed device for bottle-stoppering machines, a hopper, a rotary disk arranged therein, chutes leading from said hopper, and a yielding friction device on the outer lower peripheral edge of said disk for keeping the stoppers in motion and to bring them over said chutes and pivoted on the inside of said disk.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 28th day of February, 1898.

NELSON MUSLAR.

Witnesses:
C. A. STEWART,
A. L. MESSER.