

962,038.

Patented June 21, 1910.

3 SHEETS—SHEET 1.

Fig. 1.

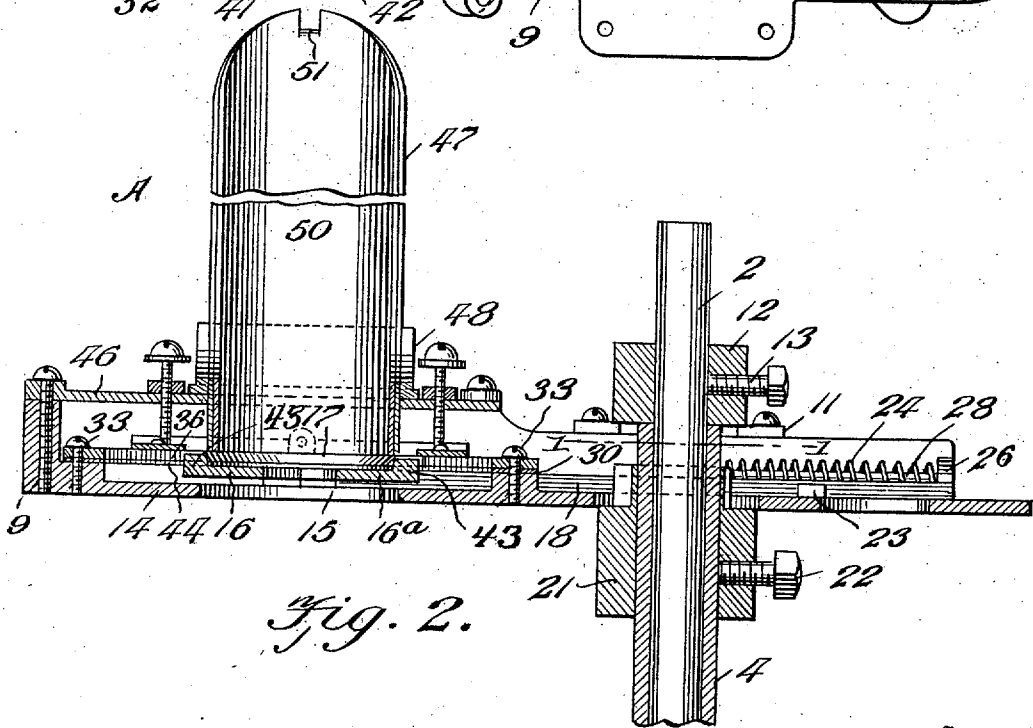
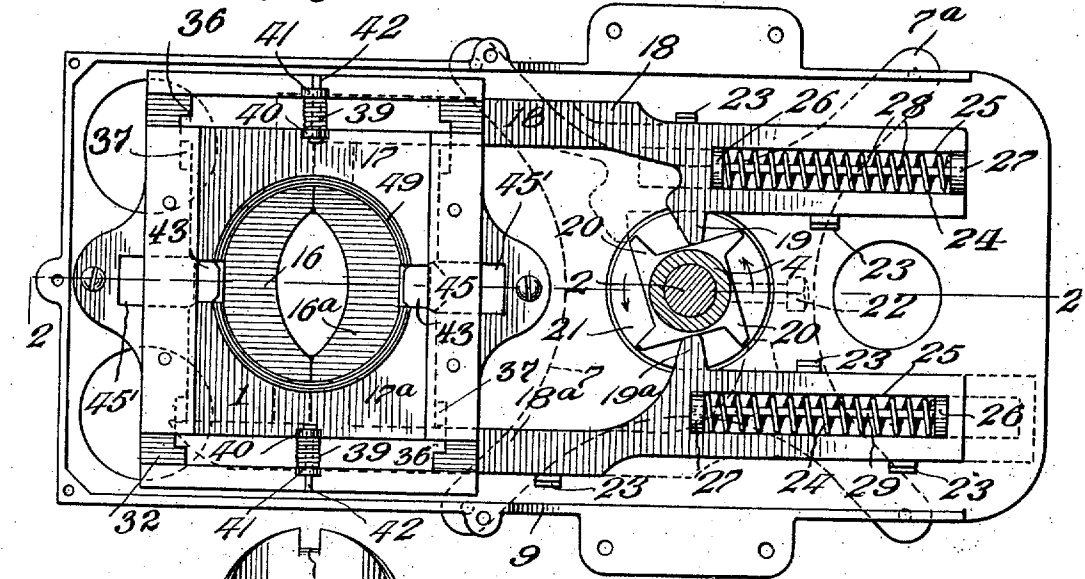


Fig. 2.

Witnesses

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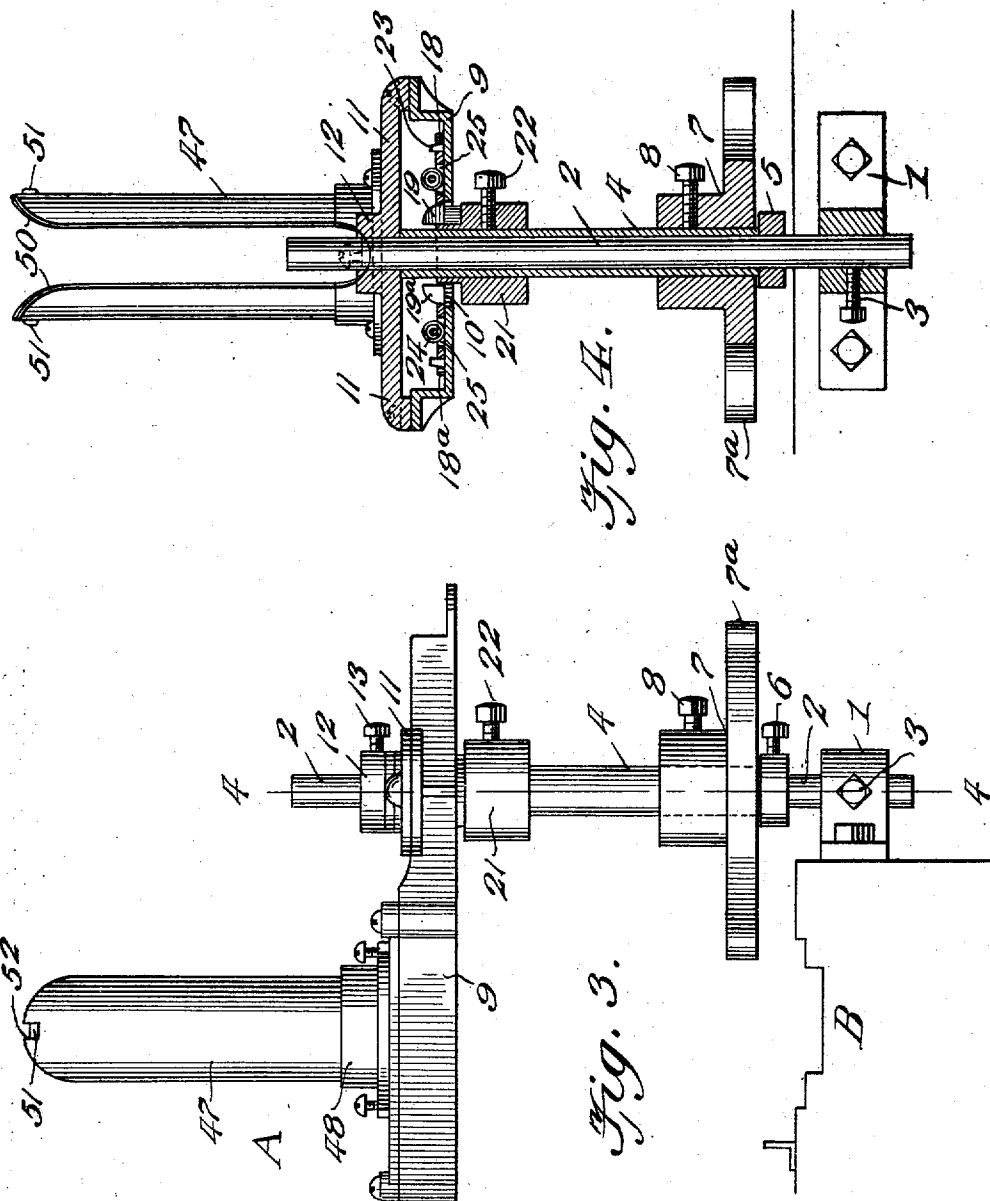
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CAN CAPPING MACHINE.
APPLICATION FILED DEC. 14, 1907.

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3 SHEETS—SHEET 2.



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3 SHEETS—SHEET 3.

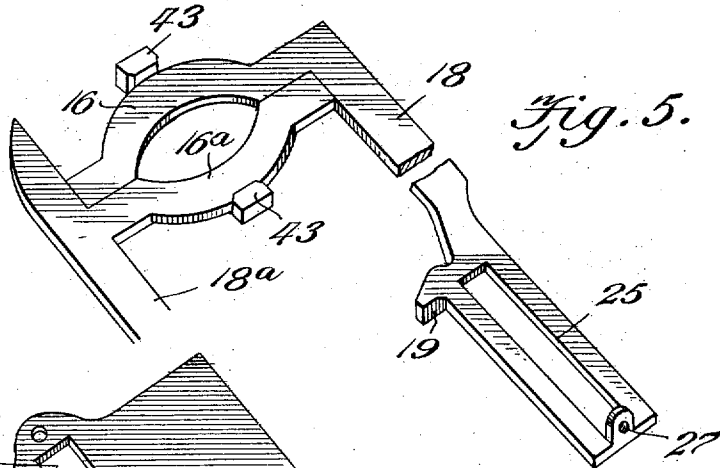


Fig. 5.

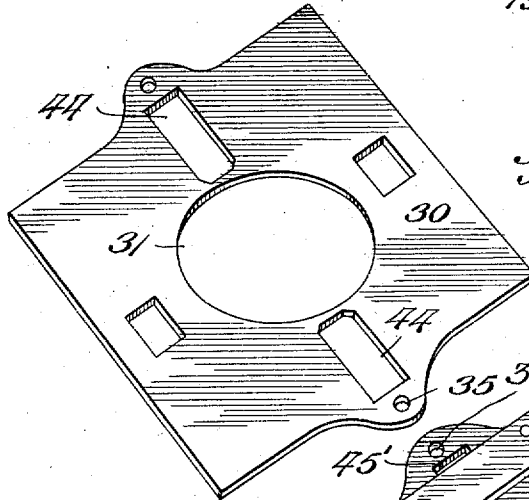


Fig. 6.

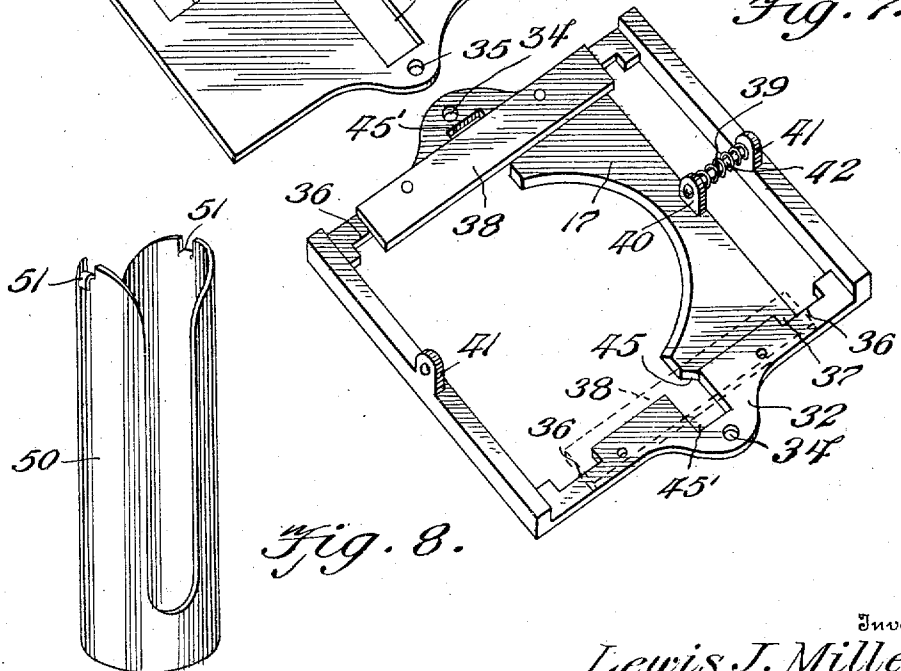


Fig. 7.

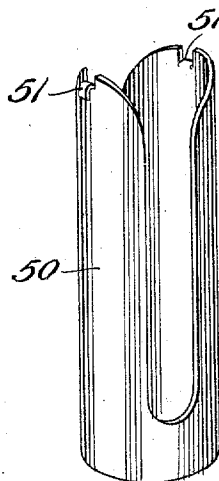


Fig. 8.

Witnesses

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UNITED STATES PATENT OFFICE.

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CAN-CAPPING MACHINE.

962,038.

Specification of Letters Patent. **Patented June 21, 1910.**

Application filed December 14, 1907. Serial No. 406,531.

To all whom it may concern:

Be it known that I, LEWIS J. MILLER, a citizen of the United States, residing at Bergen, in the county of Genesee and State of New York, have invented new and useful Improvements in Can-Capping Machines, of which the following is a specification.

This invention relates to a can capping machine and more particularly to a cap feeding mechanism whereby the caps are dropped one by one from a magazine upon the cans as they are passed successively under the mechanism.

The invention has for one of its objects to improve and simplify the construction and operation of apparatus of this character so as to be reliable and highly efficient in use, and entirely automatic in operation except for the re-charging of the magazine tube from time to time.

A further object of the invention is the provision of a vertical magazine tube in which the can caps feed downwardly by gravity, in combination with two pairs of alternately operated jaws or slide members which coöperate to drop the caps one by one upon the cans fed successively under the tube.

Another object of the invention is the employment of means for actuating the jaws or members through the agency of the cans or other receptacles to be capped, as they are fed along a way or chute disposed under the feeding mechanism for the caps.

A still further object is to provide a pair of jaws which are opened or moved away from each other by a cam device or equivalent means, and closed or moved toward each other by a quick acting device, such as a spring, so as to permit but one cap to feed at a time.

An additional object is the employment in connection with jaws operated in the foregoing manner, of a pair of additional jaws which automatically close over the bottom-most cap as the other jaws open, so as to support the column of caps in the magazine during the act of discharging the lowermost cap, one of the pairs of jaws being actuated by the other pair.

With these objects in view and others, as will appear as the description proceeds, the invention comprises the various novel fea-

tures of construction and arrangement of parts which will be more fully described hereinafter and set forth with particularity in the claims appended hereto.

In the accompanying drawings, which illustrate one of the embodiments of the invention, Figure 1 is a plan view of the apparatus with portions in section on line 1—1, Fig. 2. Fig. 2 is a vertical longitudinal section on the line 2—2, Fig. 1. Fig. 3 is a front view of the apparatus. Fig. 4 is a vertical section on line 4—4 of Fig. 3. Fig. 5 is a fragmentary perspective view of a main pair of jaws. Fig. 6 is a perspective view of the spacing plate between the two pairs of jaws. Fig. 7 is a perspective view of the frame for guiding and supporting the other pair or secondary jaws, one of the secondary jaws being removed. Fig. 8 is a perspective view of a bushing for the magazine tube for use when small caps are fed by the machine.

Similar reference characters are employed to designate corresponding parts throughout the several views.

Referring to the drawings and more particularly to Figs. 3 and 4, A designates the cap feeding mechanism and B the way or chute on which cans or other receptacles of different sizes are fed for successively receiving their caps. Mounted in a bracket projecting from the side of the guide B, is an upright or vertical rod 2 that is adjustably held in the bearing by the clamping screw 3, and on the upper end of this upright is supported the cap feeding mechanism A. On the upright is a rotatable sleeve 4 that bears at its lower end on the collar 5 that is adjustably clamped to the upright by the screw 6 and fastened to the lower end of the sleeve is a star wheel 7, the arms 7^a of which project over the guide-way B so that the cans, as they are fed under the feeding mechanism, will rotate the star wheel so as to actuate the various parts of the feeding mechanism. This star wheel can be vertically adjusted on the sleeve to which it is fastened by the clamping screw 8.

The parts of the mechanism A are mounted on a horizontal supporting frame or body 9 that has an opening 10 through which the rod 2 passes and a cross piece 11 is secured to the supporting frame 9 and has an apertured boss 12 for receiving the upper end of

the rod 2 to which the cross piece is rigidly secured by a clamping screw 13. The upper end of the sleeve 4 terminates directly under the cross piece 11 so that the latter coöperates with the collar 5 to hold the sleeve in place on the supporting rod 2. The bottom 14 of the supporting frame 9 has a cap discharging opening 15 as shown in Fig. 2, and the feed of caps through this opening is controlled by coacting main jaws 16 and 16^a and jaws 17 and 17^a, as shown in Fig. 1. The main jaws 16 and 16^a are slidably mounted on the bottom 14 of the supporting frame and are of oppositely disposed arcuate form, as shown in Fig. 5. Attached to the jaws are slide members or bars 18 and 18^a which are disposed at opposite sides of the sleeve 4 and on the bars are inwardly projecting lugs 19 and 19^a disposed in the path of the teeth 20 and the wheel or cam element 21 which is clamped to the sleeve by a screw 22. This cam element simultaneously moves the main jaws to open position by the teeth or cams 20 engaging the projections 19 and 19^a, whereby the bars 18 and 18^a are actuated in opposite directions. The said bars are guided by means of projections 23 rising from the frame 9. The main jaws are intended to be moved to closed position by suddenly acting devices so as to prevent more than one cap from dropping at a time. For this purpose each jaw is actuated by a spring 24, the bars 18 and 18^a are provided with longitudinal slots 25 for receiving the springs 24 and projecting upwardly through the slots 25 are lugs 26 which form fixed abutments for the inner and outer ends of the respective springs, while the opposite ends of the springs bear against lugs 27 formed on the bars 18 and 18^a. The springs are held in place by rods 28 and 29 which are fixed respectively in the lug 27 of the bar 18 and lug 26 which extends into the slot of the bar 18^a, the opposite ends of the rods being slidably mounted respectively in the other lugs 26 and 27. As the jaws are opened by the cam element, as shown by dotted lines in Fig. 1, the springs are compressed so that the jaws may be suddenly closed as soon as the teeth 20 pass out of engagement with the projecting lugs 19 and 19^a. It is to be noted that the number of teeth 20 on the cam element is the same as the number of teeth or arms 7^a on the star wheel, this being for the purpose of feeding a cap to every can actuating the star wheel.

The secondary jaws 17 and 17^a are disposed over the main jaws and are separated therefrom by a spacing plate 30 which is clearly shown in Fig. 6, the same having an opening 31 for permitting the caps to pass therethrough. The upper pair of jaws are adapted to be actuated by the movement of the main jaws in such a manner that as the latter open the secondary jaws will close

and as the two pairs of jaws are spaced apart, the lowermost cap will be entrapped between the pairs of jaws so that the said cap will be discharged from between the main jaws while the secondary jaws will support the column of caps in the magazine. The secondary jaws move at right angles to the line of movement of the main jaws and are slidably mounted in a rectangular frame 32, Fig. 7, which frame is mounted on the top side of the spacing plate 30 and secured in fixed position on the frame 9 by screws 33 which pass through openings 34 and 35 on the frame 32 and plate 30, respectively, and screw into tapped openings in the supporting frame 9, as clearly shown in Fig. 2. The frame 32 is provided with slots 36 into which extend lugs 37 on the ends of the secondary jaws, whereby the ends of the slots limit the movement of the jaws. Secured to the frame 32 are strips 38 that overlap the ends of the secondary jaw so as to prevent the latter from vertical displacement, one of said strips being removed and represented by dotted lines in Fig. 7. The secondary jaws are normally held in closed position by springs 39 disposed between lugs 40 and 41 on the jaws and frame 32, respectively, and rigidly secured to the lugs 40 are rods 42 which slidably engage in the apertures of the lugs 41 to thereby hold the springs in place. The secondary jaws are opened by means of wedges 43 rising from the jaws 16 and 16^a and passing through slots 44 in the spacing plate 30 so as to engage between the secondary jaws. The corners of the secondary jaws are beveled as at 45, Figs. 1 and 7 so as to permit the wedges to enter between the jaws. When the main jaws open the wedges move outwardly so as to permit the secondary jaws to close under the tension of the springs 39, and when the main jaws close the wedges will force the secondary jaws apart or to open position. The frame 32 is provided with recesses 45' for receiving the wedges as the main jaws open. By means of this construction the secondary jaw as well as the main jaws are opened positively and more or less slowly while the closing movement is effected rapidly by reason of the springs.

Mounted on the supporting frame is a cover plate 46 for protecting the jaws and other working parts from dust and dirt and carried by this cover plate is a magazine in the form of a vertical tube 47 that is held in a socket 48 secured to the cover plate. The magazine tube is slotted longitudinally at diametrically opposite points so as to enable the operator to readily place the caps therein and the lower end of the tube terminates in close proximity to upper secondary jaws 17 and 17^a. The curved edges 49 of these jaws are beveled downwardly from the top surfaces for enabling the caps to pass be-

tween the jaws. When small caps are to be employed, a bushing 50, similar in form to the magazine tube, is placed in the latter and the upper end of the bushing, as clearly shown in Fig. 8, has hook-shaped lugs 51 struck out therefrom for engaging in recesses 52 in the magazine tube, thereby supporting the bushing in proper position.

In practice the magazine tube is supplied with a charge of caps and they rest on the jaws 16 and 16^a. As the cans or other receptacles to be capped are fed over the guide-way B, the star wheel is turned so as to cause the main jaws to open. Before the said jaws are fully opened, the wedges 43 move from between the secondary jaws so that they will be forced between the lowermost and second cap, this being by virtue of the springs 42. The column of caps will thus be supported by the secondary jaws while the main jaws are permitting the lowermost cap to drop upon the can immediately under the cap feeding mechanism. As the next can operates the star wheel, this operation is repeated and as each can moves away from the star wheel, the main jaws close and the secondary jaws open, thereby permitting the column of caps to move one step for feeding another cap. In this manner the cans will be supplied with caps successively and in regular order without requiring the attention of an operator.

From the foregoing description, taken in connection with the accompanying drawings, the advantages of the construction and of the method of operation will be readily apparent to those skilled in the art to which the invention appertains, and while I have described the principle of operation of the invention, together with the apparatus which I now consider to be the best embodiment thereof, I desire to have it understood that the apparatus shown is merely illustrative, and that various changes may be made when desired as are within the scope of the claims.

Having thus described the invention, what is claimed as new, is:—

1. In a cap feeding apparatus, the combination of a magazine tube, a support therefor, a member mounted under the tube for reciprocatory movement, a fixed plate under the member and equivalent to the thickness of a cap, a second member disposed under the plate and mounted for reciprocatory movement, and means for simultaneously moving one member inwardly and the other outwardly to discharge the caps successively.

2. In a cap feeding apparatus, the combination of a magazine tube, a support therefor, a member mounted under the tube for reciprocatory movement, a fixed plate under the member and equivalent to the thickness of a cap, a second member disposed under the plate and mounted for reciprocatory movement, means for simultaneously mov-

ing one member inwardly and the other member outwardly to discharge the caps successively, said means including a device on the second member which engages the first member to actuate the latter.

3. In a cap feeding apparatus, the combination of a cap holder having a discharge opening at its bottom, a pair of jaws disposed under the opening, a plate under the jaws, a second pair of jaws disposed immediately under the plate, cooperating means between the under and upper jaws for opening the upper jaws during the closing of the under jaws, and means for actuating the under jaws.

4. In a cap feeding apparatus, the combination of a cap holder having a discharge opening at its bottom, a pair of jaws disposed under the opening, a plate under the jaws, a second pair of jaws disposed immediately under the plate, cooperating means between the under and upper jaws for opening the upper jaws during the closing of the under jaws, a rotary device for simultaneously moving both under jaws open, and springs arranged to close the under jaws.

5. In a cap feeding device, the combination of a vertical magazine tube open at its bottom, two pairs of jaws arranged at the bottom of the tube and spaced apart a distance substantially equal to the thickness of a cap, and means for opening one pair of jaws while closing the other to discharge the lowermost cap in the tube.

6. In a cap feeding device, the combination of a cap holder, a pair of simultaneously-actuated members cooperating therewith, a plate on which the members slide, springs pressing on the members, a second pair of members, devices on the second members arranged to engage between the first members for moving them in opposition to the said springs, and separate means for simultaneously operating the second members.

7. In a cap feeding device, the combination of a cap holder arranged to feed the cap by gravity, two pairs of jaws cooperating to discharge the caps successively, means on one pair of jaws for actuating the other pair, and a mechanism for directly actuating the jaws carrying the said means and indirectly actuating the other pair of jaws through the said means.

8. In a cap feeding device, the combination of a cap holder, a member supporting caps in the holder, a second member spaced from the first a distance equivalent to the thickness of the cap and arranged to engage between adjacent caps when the first member is moved to deliver the lowermost cap, and a common actuating mechanism for the members.

9. In a feeding apparatus, the combination of a magazine tube, a pair of main

jaws, means for actuating the same, a pair of secondary jaws, and devices carried by the main jaws for actuating the secondary jaws.

10. In a feeding apparatus, the combination of a magazine, a pair of jaws mounted to move back and forth under the magazine to permit articles to drop therefrom, a second pair of jaws arranged above the others, wedges on the first-mentioned jaws arranged to move the second jaws open, and means for actuating the first-mentioned jaws.

11. In a feeding apparatus, the combination of a cap-holder open at its bottom, a pair of jaws normally meeting centrally under the holder and movable back and forth, another pair of jaws meeting centrally under the holder and movable back and forth in a path at right angles to the movement of the first jaws, and actuating means for the jaws.

12. In a feeding apparatus, the combination of a cap-holder open at its bottom, a pair of jaws normally meeting centrally under the holder and movable back and forth, another pair of jaws meeting centrally under the holder and movable back and forth in a path at right angles to the movement of the first jaws, a mechanism for actuating the first-mentioned jaws, and means for actuating the other pair of jaws by the first-mentioned jaws.

13. In a feeding apparatus, the combination of a vertically disposed magazine tube open at its bottom, a pair of main jaws movable simultaneously in opposite directions under the tube, a pair of secondary jaws movable simultaneously in opposite directions and cooperating with the main jaws to discharge articles from the tube one by one, an actuating means for moving the main jaws open, quick acting means for closing the main jaws, and means for opening the secondary jaws during the closing of the main jaws.

14. In a feeding apparatus, the combination of a cap-holder, a pair of main jaws, a pair of secondary jaws, a spacing plate between the two pairs of jaws, means for actuating the main jaws, devices on the main jaws for moving the secondary jaws open, and means for closing the secondary jaws.

15. In a feeding apparatus, the combination of a vertically disposed magazine tube open at its bottom, a supporting frame having an opening alining with the said tube, a plurality of members cooperating to discharge articles successively from the tube through the said opening, means for actuating certain of the members, and devices on the said actuated members for actuating the remaining members.

16. In a feeding apparatus, the combination of a magazine tube open at its bottom, a pair of main jaws disposed under the tube

and simultaneously movable outwardly or inwardly and having oppositely-disposed recesses in their meeting edges, a pair of secondary jaws similar to the others and arranged to move in a line at right angles to the movement of the main jaws, and means for opening one pair of jaws during the closing of the other pair.

17. In a feeding apparatus, the combination of a supporting frame, a magazine tube thereon, a pair of slidably mounted main jaws, a spacing plate disposed over the main jaws, a pair of secondary jaws slidable on the plate, a frame guiding the secondary jaws, springs between the secondary jaws and frame, means for actuating the main jaws, and means on the main jaws for actuating the secondary jaws against the tension of the said springs.

18. In a feeding apparatus, the combination of a supporting frame, a magazine tube thereon, a pair of slidably mounted main jaws, a spacing plate disposed over the same and having slots, a pair of secondary jaws mounted on the plate, wedges on the main jaws passing through the said slots and engaging between the secondary jaws for opening the same, means for closing the secondary jaws, and means for actuating the main jaws.

19. In a feeding apparatus, the combination of a vertically disposed magazine tube having longitudinally-extending slots at opposite sides, with a mechanism for feeding articles successively from the lower end of the tube, a frame supporting the said mechanism, a removable cover plate on the frame, and means for supporting the tube on the cover plate.

20. In a feeding apparatus, the combination of a magazine tube slotted longitudinally at diametrically opposite points, a bushing of the same shape as the tube, and means for supporting the bushing in the tube, with a feeding mechanism for controlling the discharge of articles from the tube.

21. In a feeding apparatus, the combination of a magazine tube, a pair of jaws movable back and forth under the tube, members connected with the jaws, lugs on the members projecting toward each other, a cam element disposed between the members to engage the lugs to move the jaws open, springs for returning the jaws to closed position, and means cooperating with the jaws for discharging articles successively from the tube.

22. In a feeding apparatus, the combination of a magazine tube, a pair of jaws disposed under the tube for controlling the discharge of articles therefrom, a cam element having projections adapted to move the jaws open, means for quickly closing the jaws, means cooperating with the jaws for discharging articles successively from the tube,

and a star wheel for rotating the cam element and provided with as many arms as there are projections on the said element.

23. In a feeding apparatus, the combination of a guide over which articles are fed, an upright on the guide, a star wheel rotatably mounted on the upright and extending over the guide to be actuated by the articles, a frame supported on the upright and overhanging the guide, and means for adjusting the frame toward or away from the guide, and a feeding mechanism mounted on the frame and actuated by the star wheel.

24. In an apparatus of the class described, the combination of a guideway, an upright adjustably mounted thereon, a sleeve on the upright, adjustable means supporting the sleeve, a star wheel on the sleeve, a frame removably mounted on the upright and ad-

justable toward or away from the guide, a feeding mechanism on the frame, and means on the sleeve for actuating the said mechanism.

25. In an apparatus of the class described, the combination of a guideway, a frame supported over the same, main and secondary jaws on the frame, a magazine tube disposed over the jaws, a star wheel, a cam connected with the star wheel, means for actuating the main jaws to open position by the cam, springs for returning the main jaws, and means for actuating the secondary jaws.

In testimony whereof I affix my signature in presence of two witnesses.

LEWIS J. MILLER.

Witnesses:

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GEO. J. SNYDER.