Jan. 22, 1935. J. F. GEYER 1,989,039

CAPPING MECHANISM

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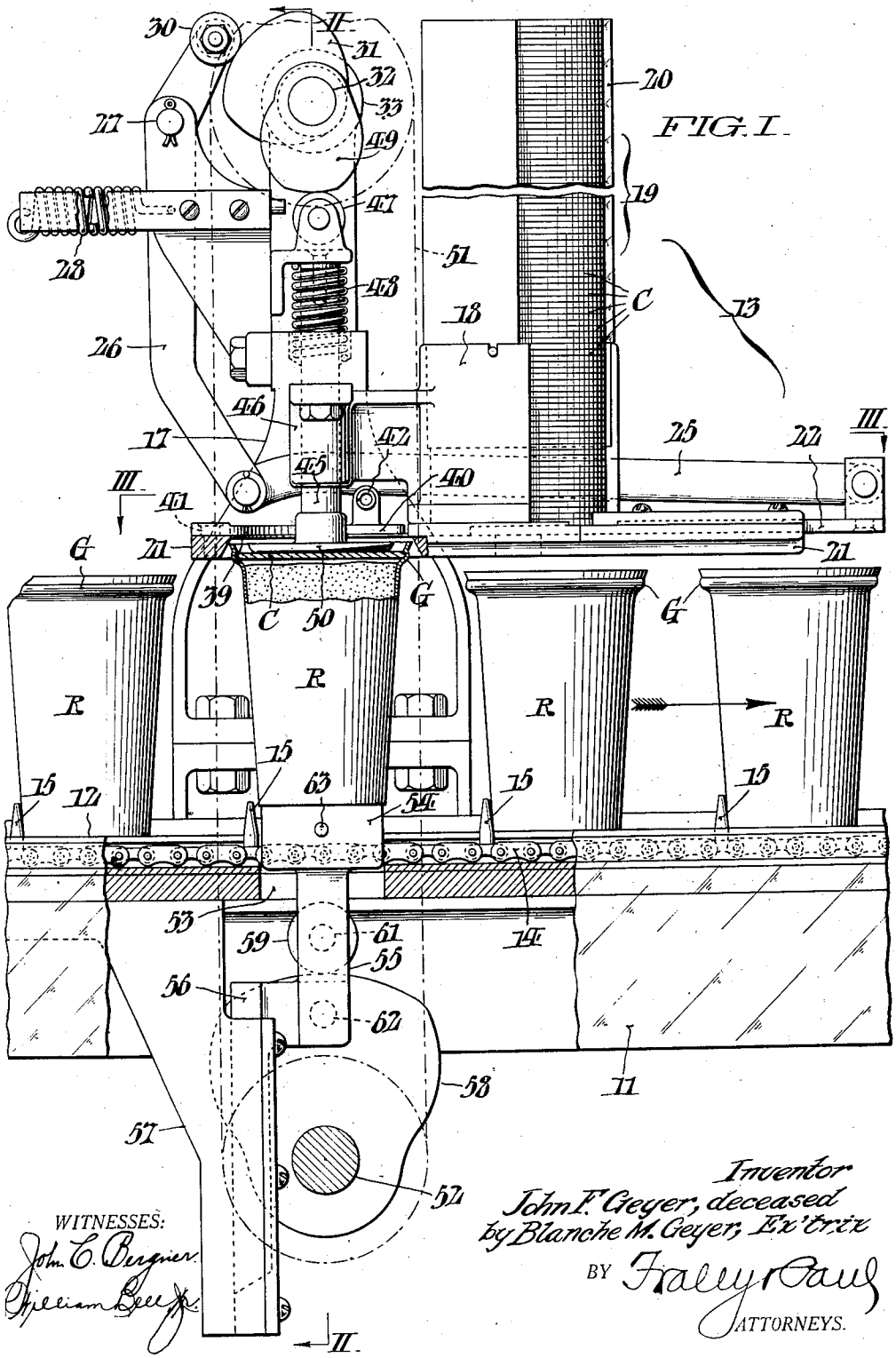


FIG. I.

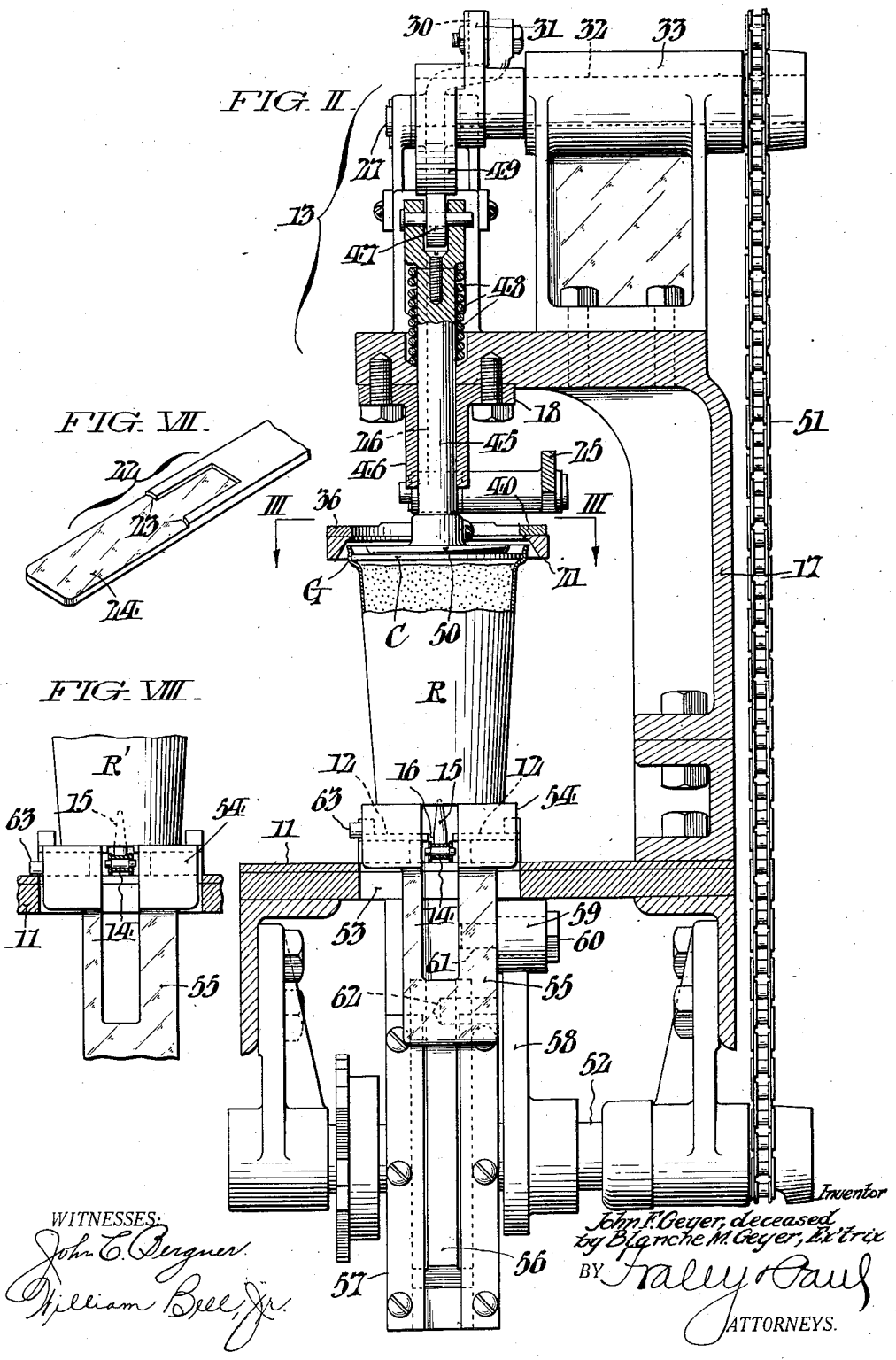
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CAPPING MECHANISM

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CAPPING MECHANISM

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FIG. III.

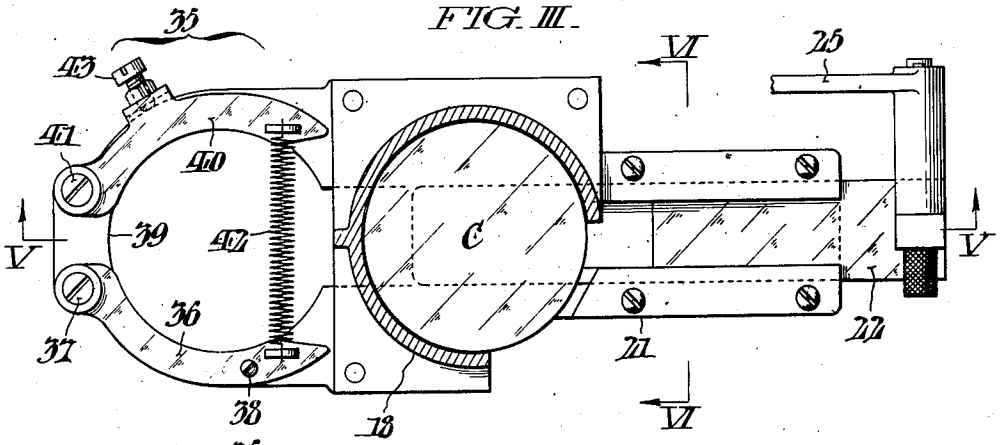


FIG. IV.

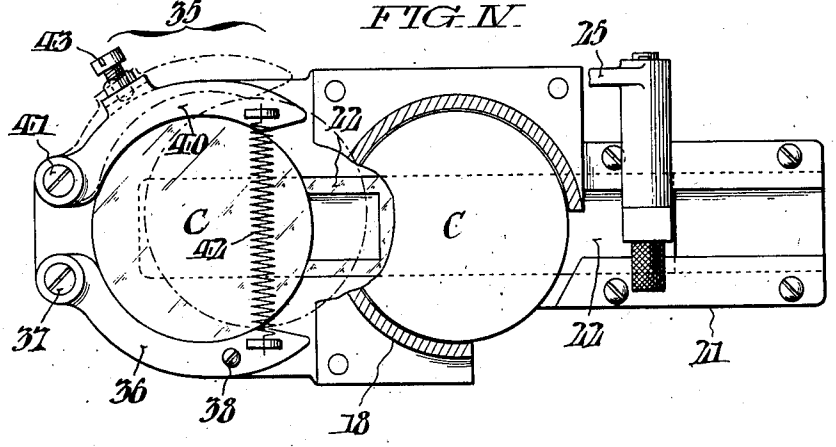


FIG. V.

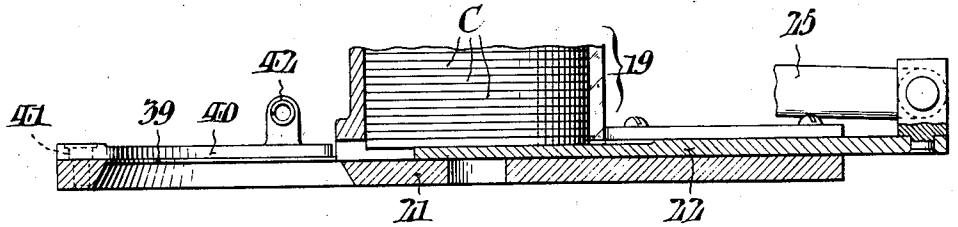
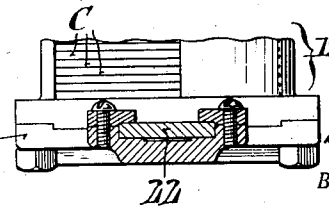


FIG. VI.



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CAPPING MECHANISM

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FIG. IX.

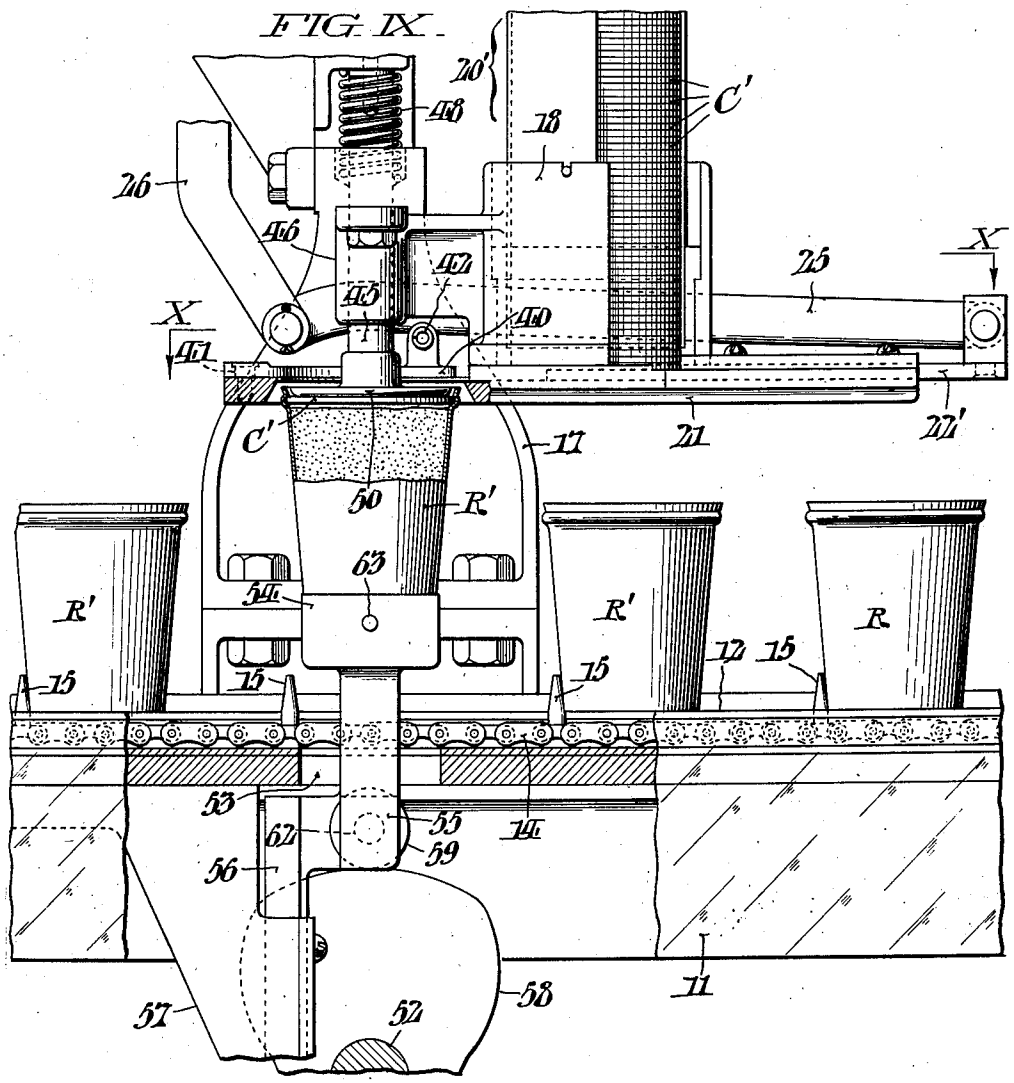
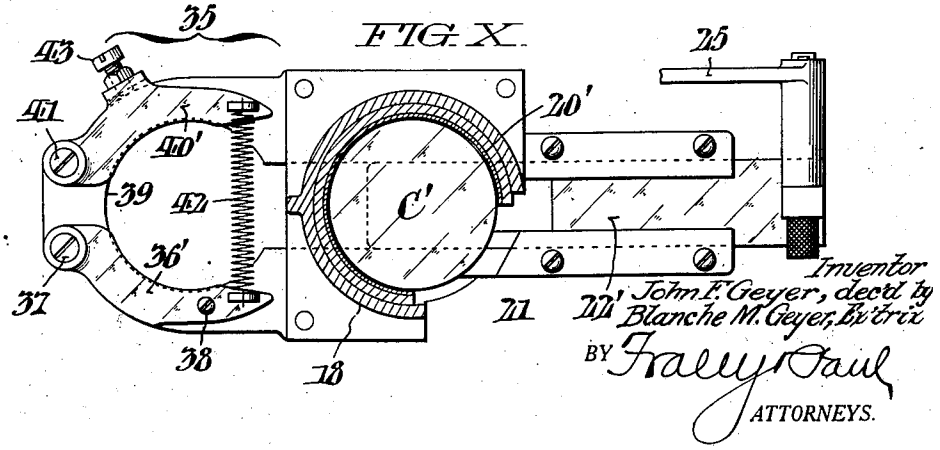


FIG. X.



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UNITED STATES PATENT OFFICE

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CAPPING MECHANISM

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Application April 15, 1932, Serial No. 605,428

4 Claims. (Cl. 226—92)

This invention relates to mechanism for applying covers or caps to receptacles. More specifically, it has reference to capping mechanism designed for incorporation in filling machines such as are used in packing ice cream and like products into paper or glass containers of a type having circumferential grooves internally of their tops for seating the edges of discous paper caps.

In the main, the invention is directed toward provision of a simple mechanism of the kind referred to which is capable of individually removing the discous caps from a supply magazine and applying them to receptacles successively presented incident to intermittent progression along the table of the filling machine; and which is adaptable to capping of receptacles of different heights.

Other objects and attendant advantages of this invention will be manifest from the detailed description following in connection with the attached drawings, wherein Fig. I is a view partly in side elevation and partly in broken away section of a portion of a receptacle filling machine fitted with the improved capping mechanism.

Fig. II is a vertical sectional view taken as indicated by the arrows II—II in Fig. I.

Fig. III is a detail plan section taken as indicated by the arrows III—III in Figs. I and II.

Fig. IV is a view like Fig. III with the parts differently positioned.

Fig. V is a fragmentary longitudinal sectional view taken as indicated by the arrows V—V in Fig. III.

Fig. VI is a detail cross sectional view taken as indicated by the arrows VI—VI in Fig. III.

Fig. VII is a detail perspective view of a slide by which the caps are individually removed from the supply magazine.

Fig. VIII is a detail sectional view corresponding to Fig. II showing certain parts in a different position.

Fig. IX is a fragmentary view corresponding to Fig. I showing the mechanism adapted for capping receptacles of lesser height and diameter; and

Fig. X is a plan sectional view taken as indicated by the arrows X—X in Fig. IX.

With more detailed reference to these illustrations, 11 indicates the table of the filling machine, whereon is mounted a track 12 along which the receptacles R are intermittently progressed in the direction of the arrow in Fig. I from a filling mechanism, not shown, to the capping mechanism with which the present invention is concerned, the said capping mechanism being generally designated by the numeral 13. The means for progressing the receptacles R as aforesaid is shown in the present instance as having the form of a sprocket chain 14 with equi-spaced upstanding pins 15 to engage the individual cups from behind, the said pins projecting upwardly through the longitudinal slot 16 in the track 12, see Fig. II.

The novel capping mechanism, it will be noted, comprises an upright bracket 17 which is bolted to the top of the table 11 adjacent the rear edge thereof. Secured in turn to this upright bracket 17 at a level above the table 11 is a lateral bracket 18 which supports a columnar gravity-feed stack magazine 19 for the caps C which are to be applied to the receptacles R. The tubular upper portion 20 of the magazine is made removable for a purpose later on explained. To the bottom of the magazine 19 is bolted a horizontal plate 21 which is aligned centrally over the conveyor 14 and which affords a guideway for a reciprocating slide 22. As shown in Figs. IV and V, the slide 22 is formed with shoulders 23 of a height corresponding substantially to the thickness of the individual caps C, as well as with a tongue 24 forwardly of said shoulders whereon the caps normally rest when the slide is retracted as in Fig. V. Reciprocatory movement is imparted to the slide 22 by means including a horizontal link 25, which, at its forward end connects with a rocker arm 26 having fulcrum support at 27 on the bracket 17. From Fig. I it will be noted that the rocker arm 26 is subject to a spring 28, and that the upward extremity thereof carries a roller 30 for cooperation with a rotary cam 31 on a transverse shaft 32 having journal support in a bearing 33 at the top of the bracket 17. Thus during its forward movement (toward the left in Fig. I) the slide advances the lowermost cap C in the pile within the magazine 19 horizontally to a yielding temporary holder means generally designated by the numeral 35 at the forward end of the plate 21. As shown in Figs. III and IV, this temporary holder means 35 consists of a pair of oppositely curved fingers whereof the one indicated at 36 is fixed, by means of screws 37 and 38, in concentric relation to an opening 39 in the plate 21, while the other finger 40 is pivoted for swinging movement on a screw stud 41 let into said plate. A tension spring 42 tends to draw the swinging finger 40 toward the stationary finger 36, the inward movement of said swinging finger being limited by an adjustable

set screw 43 which engages the edge of the plate 21 at the corresponding side. Obviously, by adjusting the screw 43, it is possible to regulate the clamping effect of the finger 40 upon the caps C. Thus with this arrangement, as the slide 22 moves a cap C forward from the magazine 19, the swinging finger 40 yields to lateral displacement in opposition to the spring 42 until the cap is finally centered over the opening 39 in the plate 21 and there held by the cooperative action of the two fingers 36 and 40.

Adapted to move downward through the opening 39 in the plate 21 is a displacing plunger 45 which is guided for up and down movement in a fixed bearing 46 afforded by the bracket 17. At its upper end the plunger 45 is fitted with a roller 47, which, by means of a compression spring 48 is maintained in operative contact with a rotary cam 49 fast on the shaft 32 which serves the cam 31 whereby the slide 22 is actuated. At its lower end the plunger 45 is fitted with a circular depressing head 50 designed to directly engage the top face of the cap C engaged between the fingers 36, 40 of the holding means 35. It is to be particularly noted from Fig. I that the cams 31 and 49 are so arranged on the shaft 32 that the slide 22 is operated in alternation with the depressing plunger 45 as required. The shaft 32 is continuously rotated through a sprocket chain connection indicated at 51 from a shaft 52 extending crosswise beneath the table 11 in direct line with the said shaft 32. The shaft 52 is in turn driven at a constant speed from the drive shaft (not shown) of the filling machine.

Coaxial with the depressing plunger 45, the table 11 is formed with an opening 53 for up and down passage of an elevator 54 that constitutes a temporary support for the receptacles R which are successively advanced into position beneath the holder means 35 by the intermittently operative conveyor 14. As shown in Figs. I and II, the elevator 54 has a depending portion 55 with a laterally offset slide 56 which is confined to vertical reciprocation in a guide 57 bolted or otherwise secured to the bottom of the table 11. The elevator 54 is actuated by a rotary cam 58 on the shaft 52, which cooperates with a roller 59 on a screw stud 60 that takes into a tapped opening 61 in the depending portion 55 of said elevator. For a purpose, also later on explained, another tapped aperture 62 is provided in the depending portion 55 of the elevator 54 at a lower level. Upon lifting of the receptacle R by the elevator 54 to the position illustrated in Figs. I and II, the cap C temporarily held by the holder means 35 is displaced downward from between the fingers 36 and 40 until its circumferential edge is lodged within the circumferential seating groove G internally of the top of said receptacle. The incidents just described occur during dwell periods of the conveyor 14, which, during each shift, serves to present a new receptacle R to the filling mechanism immediately upon descent of the elevator 54 to the level of the track 12, this position of the elevator being determined through engagement of a lateral lug 63 thereon with the top of the table 11 as shown in Fig. VIII. Obviously, the design of the various parts constituting the improved capping mechanism is such as to favor rapid operation of the filling machine with definite assurance of individual feeding to the plunger and placement of the caps onto the receptacles successively presented by the conveyor.

To adapt the mechanism for capping receptacles of lesser height, for example, receptacles of half pint size (those illustrated in Figs. I and II being pint size) certain of the parts are rearranged, and substitutes made for others in accordance with Figs. IX and X, wherein the smaller receptacles are designated R'. As shown, the screw stud 60 for the roller 59 has been transferred to the lower aperture 62 in the pendant portion 55 of the elevator 54, whereby the latter is moved correspondingly higher by the rotary cam 58 and the top edge of the receptacle R' brought into the same relation with the holder means 35 as was the case with the larger or pint size receptacle R in Figs. I and II. For the accommodation of the smaller caps C' to fit the receptacles R', the tubular extension 20 of the magazine 19 of Figs. I and II has been replaced by the diametrically smaller extension 20' of Fig. IX, and another slide 22' substituted for the one previously used, said substitute slide being properly portioned for operation on the smaller caps. For the holder fingers 36 and 40 of Figs. I–IV, other fingers 36' and 40' have been substituted which are identical with the first mentioned except for having inner edges of smaller radius to correspond with the smaller edge curvature of the caps C' to insure proper centralization of said caps in respect to the plunger opening 39 in the plate 21. The described re-arrangements and substitutions obviously do not in any way effect the operation of the mechanism.

Having thus described the invention, what is claimed is:

1. In capping mechanism, a gravity feed stack magazine; a juxtapositioned yielding holder adapted to receive individual caps from the magazine; means operative at each actuation to advance the lowermost cap in the magazine to the holder; a plunger with a fixed throw for displacing the cap downwardly from the holder means; means to support a receptacle beneath the holder; and actuating means to raise the support for elevation of the receptacle to receive the cap downwardly displaced from the holder by the plunger, the said actuating means including a rotary cam and a cooperating roller adjustable on the support to adapt the mechanism for capping receptacles of different heights.

2. In capping mechanism, a gravity stack magazine for the caps; a juxtapositioned yielding holder means for receiving individual caps edgewise from the magazine comprising a pair of spring-connected oppositely-curved fingers, the one fixed and the other movable toward and away from the first; a set screw on the movable finger to engage a stationary abutment whereby the extent of movement of the movable finger toward the fixed finger may be adjusted and the clamping effect upon the caps regulated; means operative at each actuation to advance the lowermost cap in the magazine horizontally into position between the fingers of the holder means; and means for displacing the cap from between the fingers of the holder means onto the receptacle supported therebeneath.

3. In capping mechanism, a table; a gravity feed stack magazine for the caps supported above the table; a juxtapositioned holder for receiving individual caps from the magazine; means operative at each actuation to advance the lowermost cap in the magazine to the holder; a plunger with a fixed throw for displacing the cap downwardly

from the holder means; a conveyor chain for progressing the receptacles to be capped along the table for successive placement in position beneath the holder; a plunger elevator centrally recessed in its top to clear the conveyor chain incident to raising an individual receptacle to receive the cap downwardly displaced from the holder by the plunger; and a rotary actuating cam cooperating with a roller adjustable on the elevator to adapt the mechanism for capping receptacles of different heights.

4. In capping mechanism, a gravity feed stack magazine for the caps; a juxtapositioned yielding holder means for receiving individual caps edgewise from the magazine, comprising a pair of spring-connected oppositely-curved fingers, one fixed and the other movable toward and away from the first; adjustable means whereby the extent of movement of the movable finger toward the fixed finger may be adjusted and the clamping effect on the caps regulated; means operative at each actuation to advance the lowermost cap in the magazine horizontally into position between the fingers of the holder means; and means for displacing the cap from between the fingers of the holder means onto a receptacle supported therebeneath.

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Executrix of the Estate of John F. Geyer, Deceased.