July 18, 1933.

H. A. HARDER

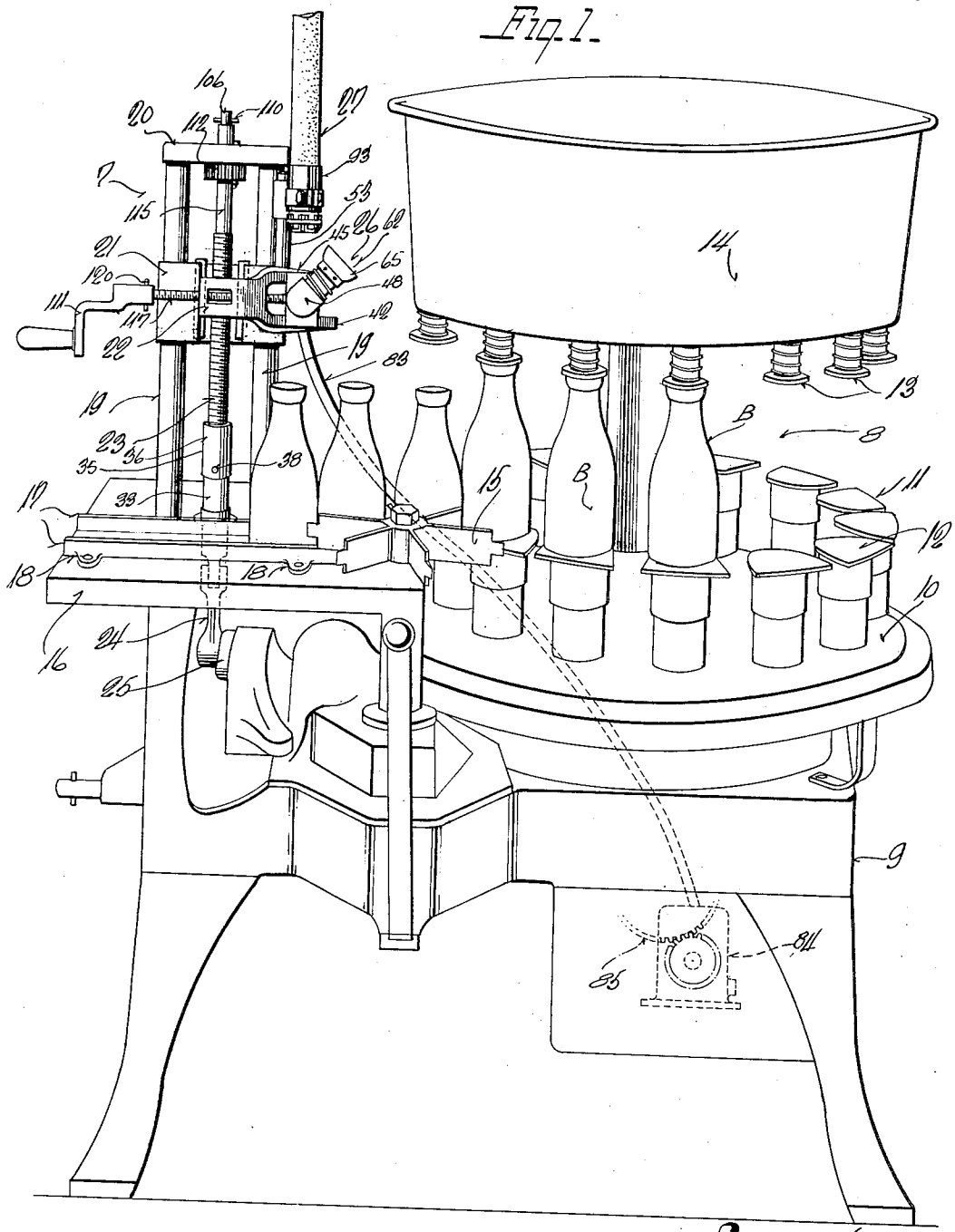
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BOTTLE CAPPING MACHINE

Filed Sept. 2, 1930

5 Sheets-Sheet 1

Fig. 1.



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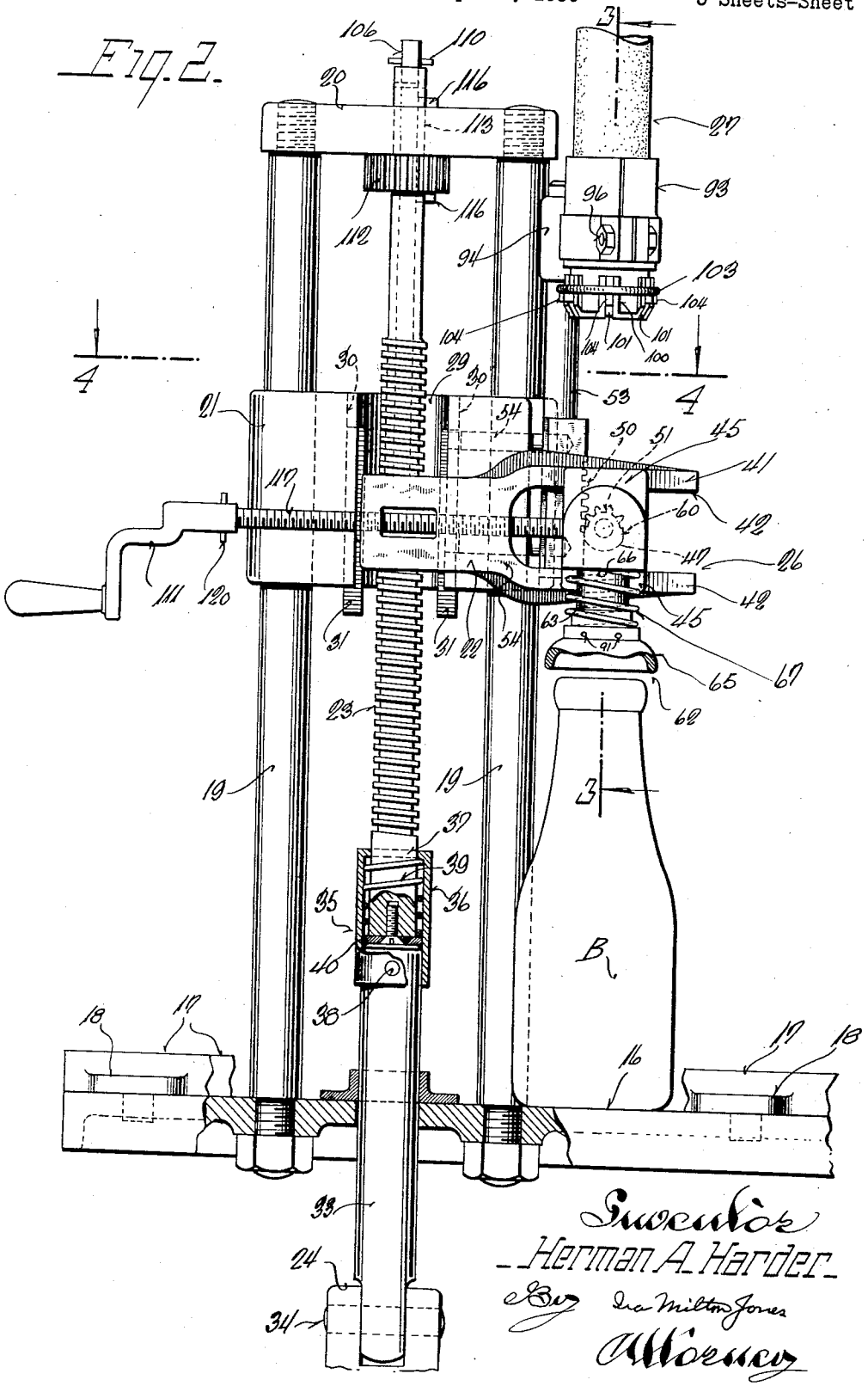
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BOTTLE CAPPING MACHINE

Filed Sept. 2, 1930 5 Sheets-Sheet 2

Fig. 2.



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BOTTLE CAPPING MACHINE

Filed Sept. 2, 1930 5 Sheets-Sheet 3

Fig. 3

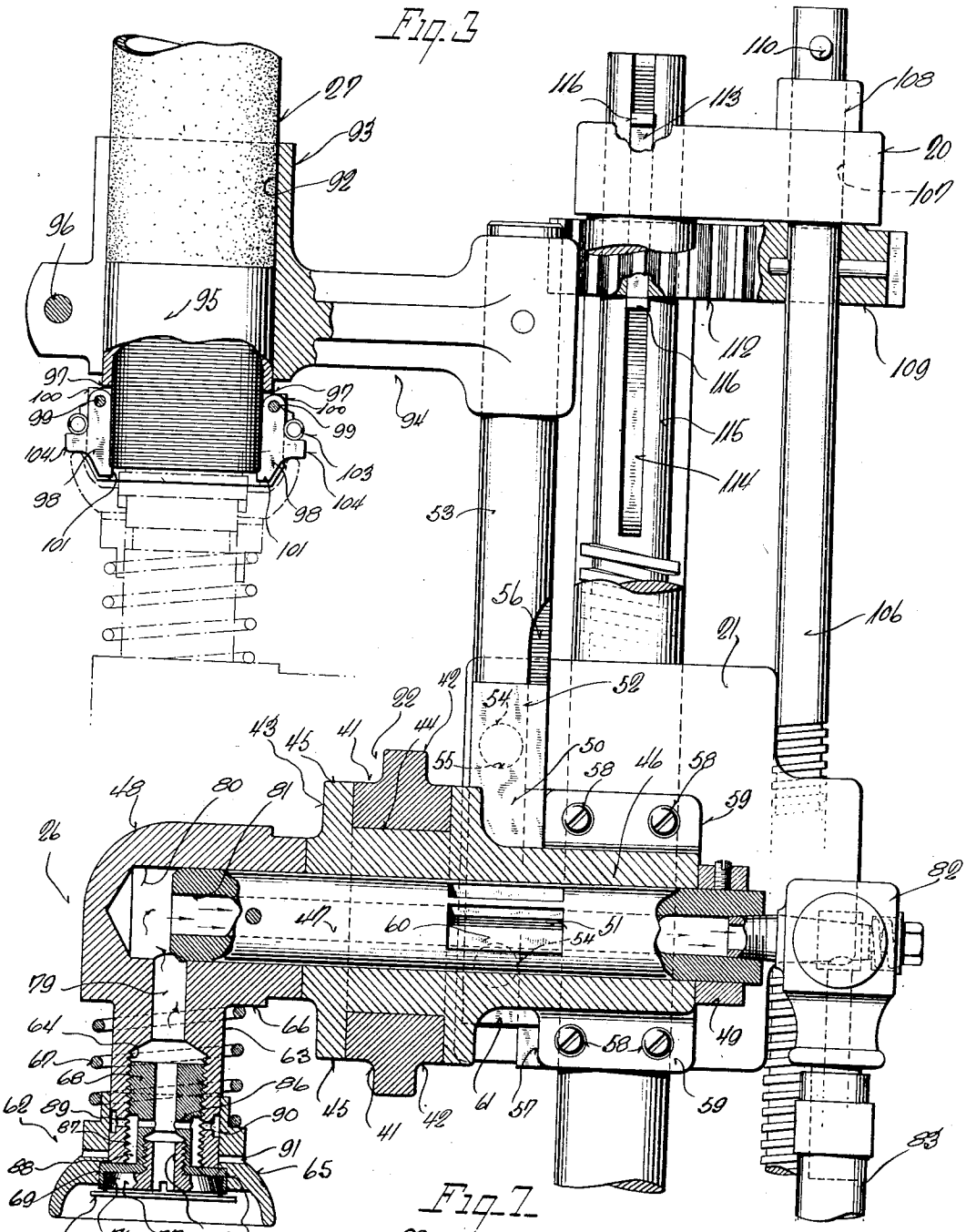
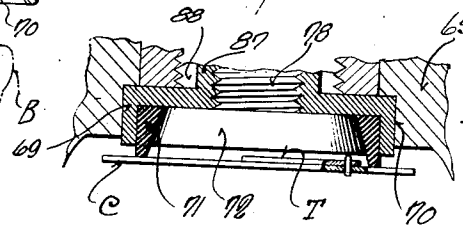


Fig. 7



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BOTTLE CAPPING MACHINE

Filed Sept. 2, 1930 5 Sheets-Sheet 4

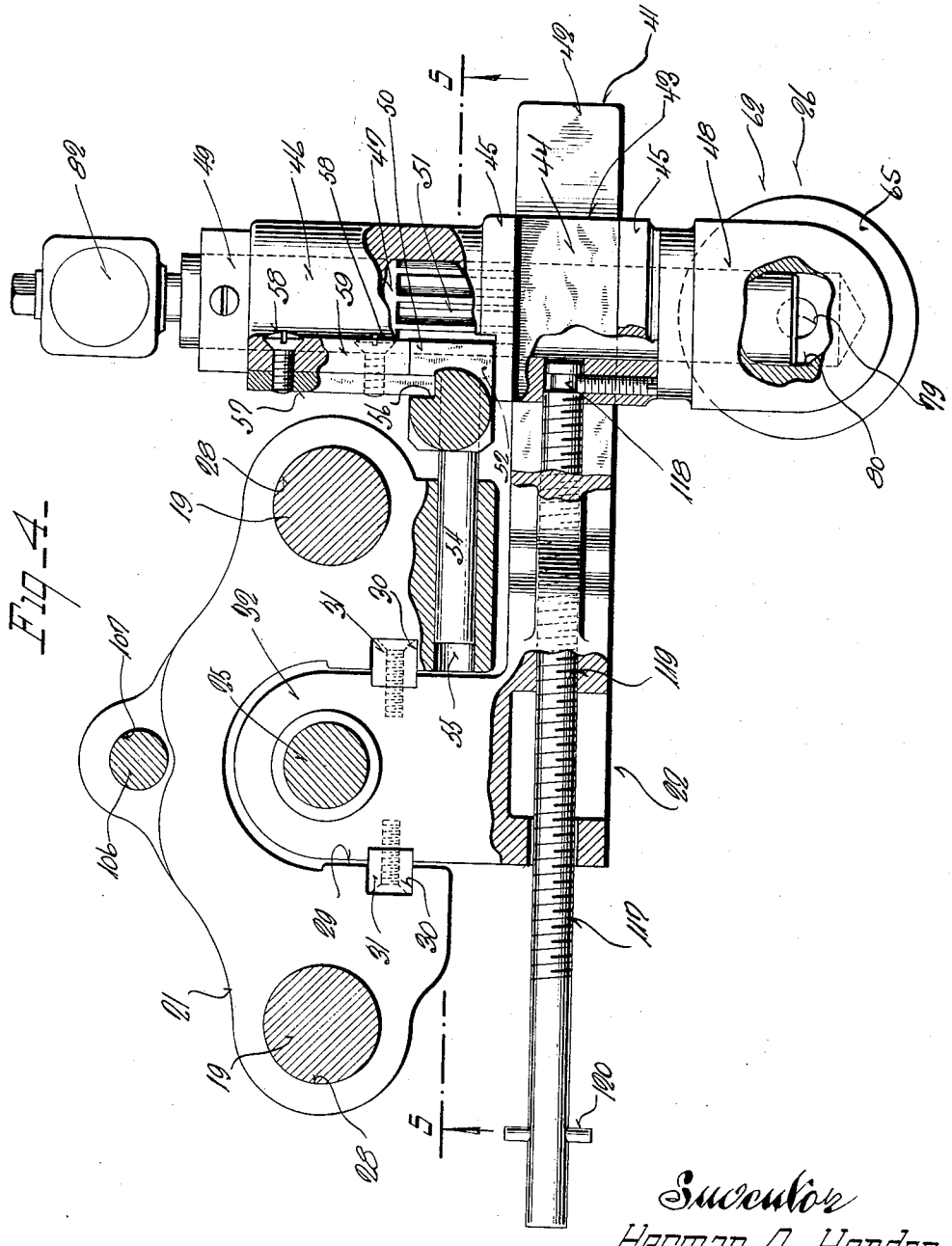


Fig. 4.

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BOTTLE CAPPING MACHINE

Filed Sept. 2, 1930 5 Sheets-Sheet 5

Fig. 5.

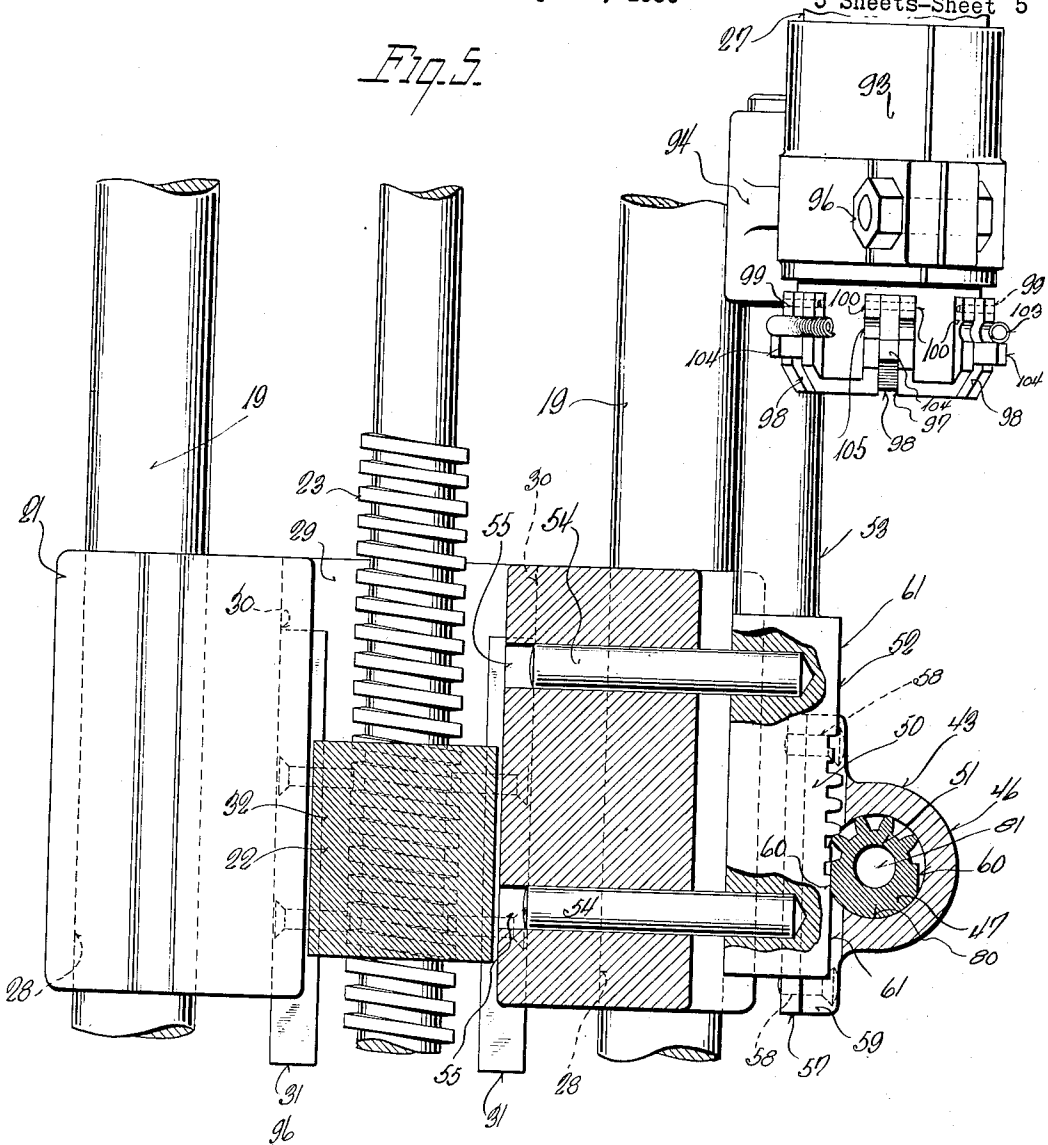
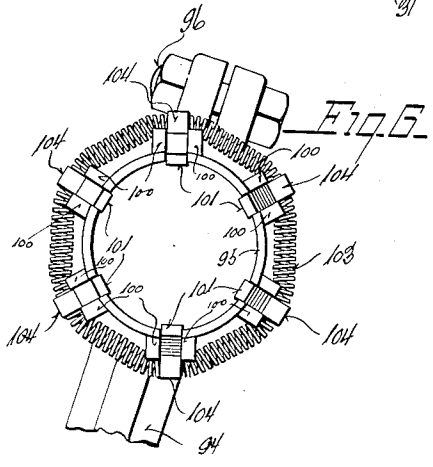


Fig. 6.



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Patented July 18, 1933 1,919,060

UNITED STATES PATENT OFFICE

HERMAN A. HARDER, OF MILWAUKEE, WISCONSIN

BOTTLE CAPPING MACHINE

Application filed September 2, 1930. Serial No. 479,274.

This invention relates to certain new and useful improvements in bottle capping machines and refers more particularly to machines for applying cardboard caps to milk bottles.

Recently milk bottle caps have been provided with small tabs to facilitate their removal from the bottles. Many methods of attaching these tabs to the caps may be employed, but obviously the cheapest and most desirable type of fastening is one in which the tab is attached to the top surface of the cap, as it permits the cap to maintain its full thickness throughout and places the tab in an easily grasped position.

However, as all capping machines heretofore in use necessitated that the caps be of uniform thickness, it has been necessary to sink the tabs beneath the surface of the cap. This requirement not only greatly increased the cost of the caps, but also materially weakened the caps.

It is, therefore, an object of this invention to obviate the necessity for sinking the tabs of milk bottle caps down into the material of the cap, by providing an improved capping machine for handling caps of varying thickness.

Another object of this invention resides in the provision of a novel capping machine in which pneumatic means are employed to transfer the caps from a supply magazine to the tops of the bottles.

Another object of this invention is to provide simple and efficient means for adjusting the capping device to accommodate different sized bottles.

And a further object of this invention is to provide a ruggedly constructed machine which will easily withstand the hard and constant use to which machines of this type are subjected.

With the above and other objects in view which will appear as the description proceeds, my invention resides in the novel construction, combination and arrangement of parts substantially as hereinafter described and more particularly defined by the appended claims, it being understood that such changes in the precise embodiment of the herein disclosed invention may be made as come within the scope of the claims.

In the accompanying drawings, I have illustrated one complete example of the physical embodiment of my invention constructed according to the best mode I have so far devised for the practical application of the principles thereof, and in which:

Figure 1 is a perspective view illustrating my improved capping device as used in conjunction with a bottle filling machine;

Figure 2 is an enlarged front elevational view of the capping device with parts broken away to illustrate structural details;

Figure 3 is a view partly in section and partly in elevation taken on the plane of the line 3—3 of Figure 2;

Figure 4 is a cross sectional view taken through Figure 2 on the plane of the line 4—4;

Figure 5 is a sectional view taken through Figure 4 on the plane of the line 5—5;

Figure 6 is a fragmentary detail view of the bottom of the cap supply magazine, and

Figure 7 is an enlarged detail view illustrating the manner in which the cap carrying means engages the cap so as to accommodate a tab projecting from the cap surface.

Referring now more particularly to the accompanying drawings in which like numerals designate like parts throughout the several views, the numeral 7 indicates generally a bottle capping device constructed in accordance with my invention and illustrated, in the present instance, as operating in conjunction with a bottle filling machine 8. As the particular construction of the bottle filling machine forms no part of this invention, and the capping device may be used independently thereof or with any other type of bottle conveying means, a detailed description of the filling machine is unnecessary.

Briefly the filling machine consists of a frame 9 in which the motor and other driving elements, not shown, are mounted and upon which a rotatable table 10 carrying a plurality of circumferentially arranged bottle supports 11, operates. The bottle supports 11 have vertically reciprocable ele-

ments 12 which are in their lowermost positions during a portion of their circumferential travel with the table 10, to receive the empty bottles B. After the bottles are properly positioned, the elements 12 are raised until the open mouths of the bottles engage the downwardly projecting valved discharge ports 13 projecting from the bottom of a supply tank 14, to be filled as they are carried along by the rotation of the table 10, the tank 14 obviously rotating in unison with the table.

The speed of rotation of the table 10 is so co-related with the rate of discharge, that the bottles are filled during less than a complete revolution of the table, and at a point adjacent the front of the machine the bottle supporting elements 12 are lowered and the filled bottles are moved therefrom by a paddle wheel or spider 15 which is driven from the mechanism of the machine, not shown.

The paddle wheel 15 pushes the filled bottles onto a table 16 between a pair of tracks 17 for movement forwardly to the capping device 7. The tracks 17 are adjustable on the table 16 to permit them to be moved toward and away from each other to accommodate bottles of different diameters, and while any desired means may be employed for adjustably securing the tracks in position, they are at present illustrated as having ears 18 from which pins project to be received in suitable holes drilled in the table 16 at the proper locations.

It is noted that the bottles are spaced from each other throughout their travel with the table 10 during the time in which they are filled, and after the bottles reach the table 16 they are pushed along by engagement with each other. The space between the bottles thus provides a period of dwell for the bottle in line with the capping device which is sufficiently long to permit the capping operation. In this manner a more even conveyance of the filled bottles is obtained and consequently milk which otherwise is lost by being splashed out of the bottles, is saved.

The capping device per se, consists of a stationary support provided by a pair of spaced up-right posts 19 anchored to the table 16 at their lower ends and connected by a cross piece 20 at their upper ends. This stationary support mounts a vertically adjustable head 21 in which an auxiliary head 22 is vertically reciprocable by means of a shaft 23 having its lower end connected with a crank arm 25 through a connecting rod 24. The crank 25 is drivingly connected with the mechanism of the filling machine in any desired manner and, as illustrated in Figure 1, the connecting rod 24 is disposed beneath the table 16.

The auxiliary head 22 carries a cap transferring and applying mechanism 26 which is operated by the vertical reciprocation of the head 22 to individually transfer caps from a supply magazine 27 to the mouths of the bottles B as they are aligned with the capping device, the mechanism being so timed, that the cap transferring mechanism 26 is in its bottle engaging position just at the time the bottle is aligned therewith.

The head 21 which may be considered the main supporting element or head of the transferring mechanism, is substantially U-shaped and has vertical bores 28 in its outer ends in which the posts 19 are slidably received, and the inner sides of its central opening 29 have opposed longitudinal guide-ways 30 in which slide members or guides 31, secured to the opposite sides of a rearward projection 32 on the auxiliary head 22 are slidably received to guide the head 22 for vertical reciprocation.

As hereinbefore stated, vertical reciprocation of the head 22 is affected by the crank 25 and the connecting rod 24 which is connected with the head through the medium of the shaft 23, the shaft 23 being threadedly connected with the rearward extension 32 of the head 22, and the threaded engagement accommodating bodily adjustment of the entire structure carried by the main head 21 vertically along the posts 19, as will be hereinafter more fully described.

Interposed between the lower end of the shaft 23 and the connecting rod 24 is a shaft extension 33, which is slidable in a bushed opening in the table 16 with its lower end attached to the connecting rod by a pin 34 and its upper end connected with the shaft 23 through a yielding connection 35. The yielding connection 35 is best illustrated in Figure 2, and comprises a cup-shaped sleeve 36 having its closed end apertured, as at 37, to receive the adjacent end of the shaft 23 and its open end passed over the shaft extension 33 and pinned thereto, as at 38. An expansive spring 39 is confined between the bottom of the sleeve 36 and a disc 40 secured to the end of the shaft 23, so that a yielding connection is offered only when tension is applied to the connection, but a positive drive is offered when the crank acts to place the shaft in compression. This yielding connection between the crank 25, which has a positive distance of travel, and the screw threaded shaft 23, accommodates an excess motion on the part of the crank to provide a spring tension for the capping mechanism, as will be later described.

Projected from one side of the auxiliary head 22 is a forked extension 41 between the arms 42 of which a tubular supporting member 43 is horizontally slidably mounted. The tubular member 43 serves as a support for the cap transferring mechanism per se,

and comprises a medial portion 44 having parallel top and bottom walls to slidably engage the inner surfaces of the arms 42, and having upwardly and downwardly extending flanges 45 arranged to engage the sides of the arms 42 to maintain the member 43 properly assembled with the extension 41.

A rearward extension 46 on the member 43 provides a bearing for a rotatably mounted shaft 47 which projects beyond the ends of the member 43 and has an elbowed member 48 fixed to its outer end, the inner face of which engages the adjacent front surface of the member 43, and a collar 49 secured to its opposite end, the collar cooperating with the elbowed member 48 to secure the shaft 47 against axial movement.

The member 43 which mounts the cap transferring mechanism per se being positioned between the forked ends of the auxiliary head 22 is vertically reciprocable therewith and this vertical motion is employed to effect a rocking movement on the part of the shaft 47 carrying the elbowed member 48 to alternately align the same with the cap supply magazine 27 and the mouths of the filled bottles. The oscillation of the shaft 47 extends throughout 180 degrees and is brought about by the inter-engagement of a rack 50 with gear teeth 51 cut in the shaft 47 at a medial portion thereof.

The rack 50 is formed in a rectangular enlargement 52 on a stud 53, the upper portion of which serves as a support for the cap supply magazine. The stud 53 is mounted from the main head 21 by a pair of pins or dowels 54 fixed in the rectangular stud portion and slidably received in suitable bores 55 in the head 21. In this manner the stud 53 is horizontally adjustable with the supporting member 43, and to maintain the rack 50 in proper cooperative relation to the segmental gear 51 on the shaft 47, a longitudinal groove 56 is cut into the rectangular portion 52 of the stud to receive one edge portion of a plate 57 secured to the rearward extension 56 of the member 43 by screws 58 passed through upwardly and downwardly directed flanges 59 on the extension 46 and threaded in the plate. The stud 53 is thus secured against lateral movement with respect to the member 43, but vertical reciprocation of the member 43 with respect to the stud is accommodated.

As best illustrated in Figure 5, the gear teeth 51 do not extend around the entire circumference of the shaft, but only through 180 degrees and the sides of the shaft at the ends of the segmental series of teeth are flattened as at 60, to engage the flat surface 61 of the rectangular portion 52 above and beneath the rack 50, at each end of the 180 degrees rotation of the shaft, to hold the shaft against rotation; also the diameter of the gear teeth 51 is such that the full 180 degrees of rotation of the shaft 47 requires less vertical movement of the member 43 than the total vertical reciprocation of the auxiliary head 22, and the rack teeth 50 are so located with respect to the vertical travel of the member 43 that the shaft rotates during the medial portion of its vertical travel and is held against rotation at both the upper and lower extremities of its travel. This action on the part of the shaft 47 imparts to the cap carrying mechanism indicated generally by the numeral 62 and carried by the elbowed member 48, the desired movement as will now be described.

The elbowed member 48 has a tubular extension 63 which is disposed vertically at the ends of the aforementioned vertical reciprocation, and which has a large internally threaded bore 64 in its outer end. Embracing the extension 63 at its outer end is a bottle engaging bell 65 between the upper end of which and a shoulder 66 at the base of the extension 63, an expansive spring 67 is confined to at all times yieldably urge the bell 65 outwardly.

The action of the spring 67 is opposed and the bell 65 is maintained on the extension 63, by a stud 68 threaded in the bore 64 and provided with an annular flange 69 at its lower end which is received in a counter-bore 70 in the bottom of the bell 65. The flange 69 has its outer face counter-bored to receive an annular rubber gasket 71 which is maintained assembled with the flange 69 by a disc 72 having a central exteriorly threaded projection 78 threaded in a central aperture in the member 68.

An air passage 79 formed jointly by central bores in the disc member 72, the stud 68 and the elbowed member 48 extends from the outer face of the disc member 72 to the bore 80 in the elbowed member in which the end of the shaft 47 is received, and as the shaft terminates short of the passage 79, communication is afforded from the atmosphere through said passage 79 to a bore 81 extending longitudinally through the shaft 47.

The end of the bore 81 in the shaft 47 opposite the elbowed member 48, is communicated by means of a fitting 82 and a flexible tube 83, with a suitable air suction pump 84 which in the present instance is illustrated as being mounted within the machine 8 and driven from one of its gears 85, so that a partial vacuum may be created at the outer end of the air passage-way 79 to hold a cap C against the periphery of the rubber washer 71. In this manner a cap is taken from the supply magazine and transferred to the mouth of a bottle, and in Figures 2 and 3 the cap carrying mechanism is illustrated in its position preparatory to placing the cap over the mouth of a bottle. In the position illustrated in these views the rocking movement of the shaft and consequently the elbowed member has just been completed and further

movement on the part of the auxiliary head lowers the cap carrying mechanism onto the mouth of the bottle.

As the cap carrying mechanism approaches the bottle the bell 65 first engages the same to insure its proper alignment with the cap and as the downward movement continues, the bell, due to its engagement over the mouth of the bottle, remains stationary compressing the spring 67. The cap carrying mechanism, per se, however, continues its downward movement until the cap engages the mouth of the bottle. To insure proper application of the cap over the bottle mouth, a degree of pressure is required, consequently the mechanism is so adjusted vertically with respect to the height of the bottle, that after the cap is engaged with the bottle, downward vertical movement on the part of the connecting rod 24 still continues, the excess motion of the rod 24 and consequently the shaft extension 33 being taken up by the spring 39, as hereinbefore brought out, and the desired pressure is thus imposed upon the cap. The degree of pressure exerted is obviously controlled by the vertical adjustment of the carrying head 21 with respect to the height of the bottle.

After the cap is positioned on the bottle it is, of course, desirable that the suction holding the same to the disc 72 during its transfer from the magazine to the bottle, be relieved, to prevent withdrawing the cap as the mechanism 62 begins its upward movement. To this end a valve arrangement is provided which comprises a plurality of radially drilled apertures 86 in a reduced portion 87 of the stud 68 which communicate the air passageway 79 with an annular passage or chamber 88 formed between the wall of the internally threaded bore 64 and the reduced portion 87 of the stud. A second set of radial apertures 89 drilled in the extension 63 communicates the annular chamber 88 with a second annular chamber 90 formed between the bell 65 and the extension 63.

Normally, however, the bore of the bell 65 in which the extension 63 is received closes the annular channel 90 and prevents leakage of the vacuum, but as, during the application of the cap to the bottle, relative axial movement takes place between the bell 65 and the extension 62, a plurality of ports 91 drilled in the bell 65 become aligned with the chamber 90 and thus relieve the vacuum.

It is noted that the peripheral edge of the rubber gasket 71 which engages the cap, projects beyond the outer face of the disc 72 so that a space is left between the disc and the cap. This space, as illustrated in Figure 7, accommodates the tab T secured to and projecting above the top of the cap as will be readily apparent.

After the cap is applied to the bottle, the continued operation of the device raises the cap carrying mechanism 62 away from the bottle in an axially vertical direction until the bell 65 clears the top of the bottle at which time the gear teeth 51 of the shaft 47 will have aligned with the lowermost of the rack teeth 50 whereupon rotation of the shaft 47 in a counterclockwise direction with respect to Figures 2 and 5 begins to take place, swinging the elbowed member 48 and the cap carrying mechanism 62 carried thereby through 180 degrees until the bell 65 points directly upward. At this time the segmental gear 51 will be turned to its position engaging one of the flat surfaces 60 of the shaft with the upper flat surface 61 of the rectangular portion 52 and during the remaining upward movement of the structure the cap carrying mechanism will maintain its axial alignment with the magazine 27.

The magazine 27 comprises a paper tube mounted in a bore 92 formed in the outer cylindrical end 93 of an arm 94, secured to the upper end of the stud 53, and a sleeve 95 vertically adjustably received in the bore 92, the tube and the sleeve 95 being clamped against axial movement in the bore 92 by a clamping bolt 96 which draws the split ends of the cylindrical portion 93 together.

The sleeve 95 has a plurality of radial slots 97 in its lower end in which cap retaining fingers 98 are pivotally mounted by pins 99 passed through the upper ends of the fingers and through spaced ears 100 formed on the outer surface of the sleeve 95. As best illustrated in Figure 3, the inner surfaces of the fingers 98 form substantially continuations of the inner wall of the sleeve 95 at the extreme lower ends of the fingers inner projections 101 extend into the interior of the sleeve to engage beneath the lowermost of the caps to support the entire stack, as will be readily apparent.

The inwardly directed projections 101, however, are comparatively small so that a slight outward movement of the fingers releases the lowermost cap for removal from the sleeve, and to hold the fingers in their normal cap supporting positions a spring ring 103 formed of a coil spring encircles the fingers. Each finger has an outwardly extending lug 104 above which the spring ring 103 is disposed and the ears 100 between which the fingers are mounted are notched, as at 105, to receive the spring ring and hold the same against vertical movement.

The lugs 104 which extend outwardly from the fingers are so located that the outer periphery of the bell 65 of the cap transferring mechanism engages them and swings the fingers outwardly as the cap transferring mechanism moves upwardly; and as the uppermost limit of vertical reciprocation of the auxiliary head 22 is fixed, the sleeve 95 is so adjusted that the bell 65 moves the fingers 98 outwardly sufficiently far to release the

lowermost cap which is drawn toward and held to the disc 72 by the continual suction at its outer face. The movement of the fingers 98 and their return to normal position is sufficiently rapid that only the lowermost cap is released.

To accommodate bottles of different sizes it is obvious that the various elements must be adjustable, and the manner in which the various adjustments are made will now be described. As already mentioned, the main carrying head 21 is slidably mounted on the vertical posts 19 and to move the same up or down and hold it at any desired position of vertical adjustment, an adjusting screw 106 is provided. The upper end of the screw 106 passes through a bore 107 in the cross piece 20 and is held against axial movement therein by a collar 108 engaging the top of the cross piece 20 and a spur gear 109 secured to the adjusting screw beneath the cross piece 20. A pin 110 in the outer end of the adjusting screw provides means for non-rotatably connecting a crank handle 111 therewith so that rotation may be imparted to the screw to raise or lower the head 21.

Vertical adjustment of the head 21, however, also necessitates relative movement between the shaft 23 and the auxiliary head 22, and for this reason the shaft 23 is screw threaded oppositely to the threads of the adjusting screw 106 and rotation is imparted to the shaft 23 through the gear 109 and a second gear 112 non-rotatably but slidably splined by means of a key 113 and a key-way 114 to the upper unthreaded end 115 of the shaft 23.

The key 113 has outwardly extending lugs 116 at its ends and is sufficiently long to extend, through the gear 112, and also through the thickness of the cross piece 20 so that the key not only provides a slidable but non-rotatable connection between the gear 112 and the shaft 115, but also serves to maintain the gear against axial movement away from the bottom of the cross piece 20. To permit rotation of the shaft end 115 and the key 113 non-rotatably disposed therein, that portion of the key within the cross piece 20 is cut away so as not to project beyond the cylindrical surface of the shaft end.

Rotation of the adjusting screw 106 thus imparts vertical adjustment to the entire mechanism so that any of the conventional bottle heights may be accommodated, and to accommodate different diameters of bottles the member 43 which carries the cap applying mechanism per se is horizontally adjustable. Horizontal adjustment is necessary as bottles of different diameters reach the capping mechanism at different times, and this adjustment of the member 43 is obtained by means of a screw 117 having its inner end freely rotatably, but non-longitudinally connected with the member 43, as at 118, and its medial portion threaded in an internally threaded bore 119 in the auxiliary head 22.

The outer end of the screw has a cross pin 120 similar to the pin 110 for engagement by the crank 111. Rotation of the screw 117 thus moves the member 43 and with it the stud 53 carrying the cap magazine toward and away from the up-right posts 19 and as hereinbefore brought out, such horizontal movement is guided jointly by the sliding engagement of the portion 44 of the member 43 with the spaced arms 42 of the auxiliary head and the dowel pins 54 slidably received in the bore 55 formed in the head 21.

From the foregoing description taken in connection with the accompanying drawings it will be readily apparent to those skilled in the art to which an invention of the character described appertains that I provide a novel bottle capping machine which does not require a uniform thickness of caps and permits the usual tabs provided to facilitate removal of the caps from the bottles to be attached to and project above the outer surface of the caps. It is also readily apparent that capping machines constructed in accordance with this invention are universally adjustable to different sizes of bottles and that rapid operation of the machine is possible.

What I claim as my invention is:

1. In a bottle capping machine, a magazine for holding a supply of caps including a substantially vertical tubular member in which the caps are stacked to drop by gravity, means engageable with the lowermost cap to hold the stack in the tubular member, means for individually transferring caps from said magazine to bottles to be capped, means for moving said last named means alternately into operative relation with the magazine and the bottles to be capped, a bell carried by the transferring means to engage over the bottle top and center the bottle during the capping thereof, and means on said cap engaging means engageable by the edge of the bell to move said cap engaging means and release the lowermost cap.

2. In a bottle capping machine having means to support a bottle to be capped and a magazine for holding a supply of caps, mechanism to transfer a cap from said magazine to the bottle and to apply the cap to the bottle comprising, a tubular shaft mounted for vertical movement and for turning movement about its own axis, a cap carrier mounted from said tubular shaft and having an air passage in communication with the bore of the tubular shaft, a cap engaging member on the carrier at the mouth of its air passage, means connected with said tubular shaft to create a partial vacuum therein to hold a cap to said cap engaging member, means to turn the shaft to alternately align the cap carrier with the magazine and with the bottle, means to move the shaft vertically to engage the

cap carrier with a cap at the magazine and to apply the cap to the bottle, and means operable upon application of the cap to the bottle to relieve the vacuum in said carrier and release the cap.

3. In a bottle capping machine, means for holding a supply of caps, mechanism for transferring a cap from said supply means to a bottle to be capped, means for reciprocating the transfer mechanism for alternate engagement with the cap supply means and the bottle top, and means on said transfer mechanism cooperating with means on said supply means and on said transfer mechanism to effect release of the caps from the supply means and the transfer mechanism when said means on the transfer mechanism engages the supply means and the bottle top, respectively.

4. In a bottle capping machine, mechanism for transferring a cap from a source of supply and applying it to a bottle to be capped comprising, a tubular member having a cap engaging outer end portion, means for producing a partial vacuum in said tubular member to hold the cap at its outer end portion, an outer element carried by said tubular member and adapted to engage the bottle to be capped, means mounting the said outer element for relative movement with respect to said tubular member, said tubular member having a port for relieving the partial vacuum therein, relief of the vacuum releasing the cap from the cap transfer mechanism, and said port being normally closed by said outer element and being uncovered as the cap is engaged with the bottle and said tubular member moves with respect thereto.

5. In a bottle capping machine, mechanism for carrying a cap to and applying it onto a bottle to be capped comprising, a tubular member movable toward the bottle, said tubular member having a port therein, annular cap engaging means carried by said member and adapted to engage the cap adjacent its peripheral edge portion, means for creating a partial vacuum in said tubular member to hold the cap against said annular means, and yieldable means covering said port and engageable with the top of the bottle whereby further movement of said cap engaging means uncovers said port to relieve the partial vacuum in said tubular member as the cap is engaged with the bottle.

6. In a bottle capping machine, mechanism for carrying a cap to and applying it onto a bottle to be capped, comprising a tubular member movable toward and away from the bottle, said tubular member having a port therein, an annular member of yieldable material for engaging one surface of a cap adjacent its peripheral edge, means for creating a partial vacuum in said tubular member to hold the cap against said annular member, the engagement of the annular yieldable member with the cap providing a space between the tubular member and the cap to accommodate projections extended above the cap surface at its central portion, and means normally covering said port and engageable with the top of the bottle to uncover the port to relieve the partial vacuum in said tubular element and release the cap as it is engaged with the bottle.

7. In a bottle capping machine, means for carrying a cap from a source of supply and applying it to a bottle to be capped, comprising a tubular element movable toward and away from the bottle, an annular member projecting beyond the open end of the tubular element to engage one surface of a cap adjacent its peripheral edge, means for creating a partial vacuum in said tubular element to hold the cap against said annular member, an outer bottle engaging bell member movably mounted on said tubular element and engageable with the bottle as the element is moved toward the same to center the bottle with respect to said element, said tubular element continuing its movement toward the bottle after the engagement of the bell with the bottle to press the cap onto the bottle, said tubular element having a port to relieve the partial vacuum therein and release the cap, and said port being normally covered by the bottle engaging bell member and being uncovered as the cap is pressed onto the bottle.

8. In a bottle capping machine, means for holding a supply of caps including a tubular sleeve in which the caps are stacked to freely move therethrough by gravity, means for normally supporting the stack of caps in said tubular sleeve comprising fingers having portions extending into the interior of the tubular sleeve to engage beneath the lowermost cap and support the stack thereabove, spring means for holding the fingers in their active positions, cap transferring mechanism for carrying the caps from said means of supply to bottles to be capped, a bell carried by said transferring mechanism to engage the bottle top and center the bottle during capping thereof and engageable with said fingers to move the same and release a cap.

9. In a bottle capping machine having means for holding a supply of caps, a member mounted for substantially vertical movement, a tubular shaft rotatably mounted in said member, mechanism connected with said tubular shaft for transferring caps from said means of supply to bottles to be capped, said mechanism having an air passage communicating with the passage provided by the tubular shaft, means connected with the shaft for creating a partial vacuum therein to hold caps to the transferring mechanism, a stud member stationary with respect to the vertical movement of the supporting member and having a portion disposed adjacent the shaft, and cooperating means carried by

the shaft and the stud member for holding the shaft and the cap transferring mechanism in alignment with the cap supply means and the bottles to be capped during the end portions of its vertical travel, and for rocking the shaft to alternately align the cap transferring mechanism with the cap holding means and the bottles to be capped during the medial portion of its vertical travel.

10. In a bottle capping machine including a magazine for holding a supply of caps, mechanism for transferring caps from said magazine to bottles to be capped and for applying the caps to the bottles, means for imparting substantially vertical and rocking movements to said mechanism to effect said transfer and application of caps, drive means for said means for imparting substantially vertical and rocking movement to the transfer mechanism, and means for adjusting the transfer mechanism and the cap supply magazine vertically and horizontally to accommodate bottles of different sizes while maintaining an operative connection between the drive means and the means for imparting substantially vertical and rocking movement to said transfer mechanism.

11. In a bottle capping machine including a magazine for holding a supply of caps, mechanism for transferring caps from the magazine to bottles to be capped and for applying the caps to the bottles, means for imparting substantially vertical and rocking movements to the mechanism to effect said transfer and application of caps, drive means for said means for imparting substantially vertical and rocking movements to the transfer mechanism, and means for adjusting the transfer mechanism and the cap supply magazine vertically and horizontally to accommodate bottles of different sizes while maintaining an operative connection between the drive means and the means for imparting substantially vertical and rocking movement to said transfer mechanism, comprising a supporting member for said transferring mechanism, a screw threaded shaft engageable with said supporting member, a carrying head in which the supporting member is slidably mounted, an adjusting screw for moving the carrying head, and a gear connection between the adjusting screw and said screw threaded shaft, the threads of said adjusting screw and screw threaded shaft being opposite, whereby the screw threaded shaft moves in said supporting member to maintain a predetermined relative position therein as the adjusting screw is actuated.

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