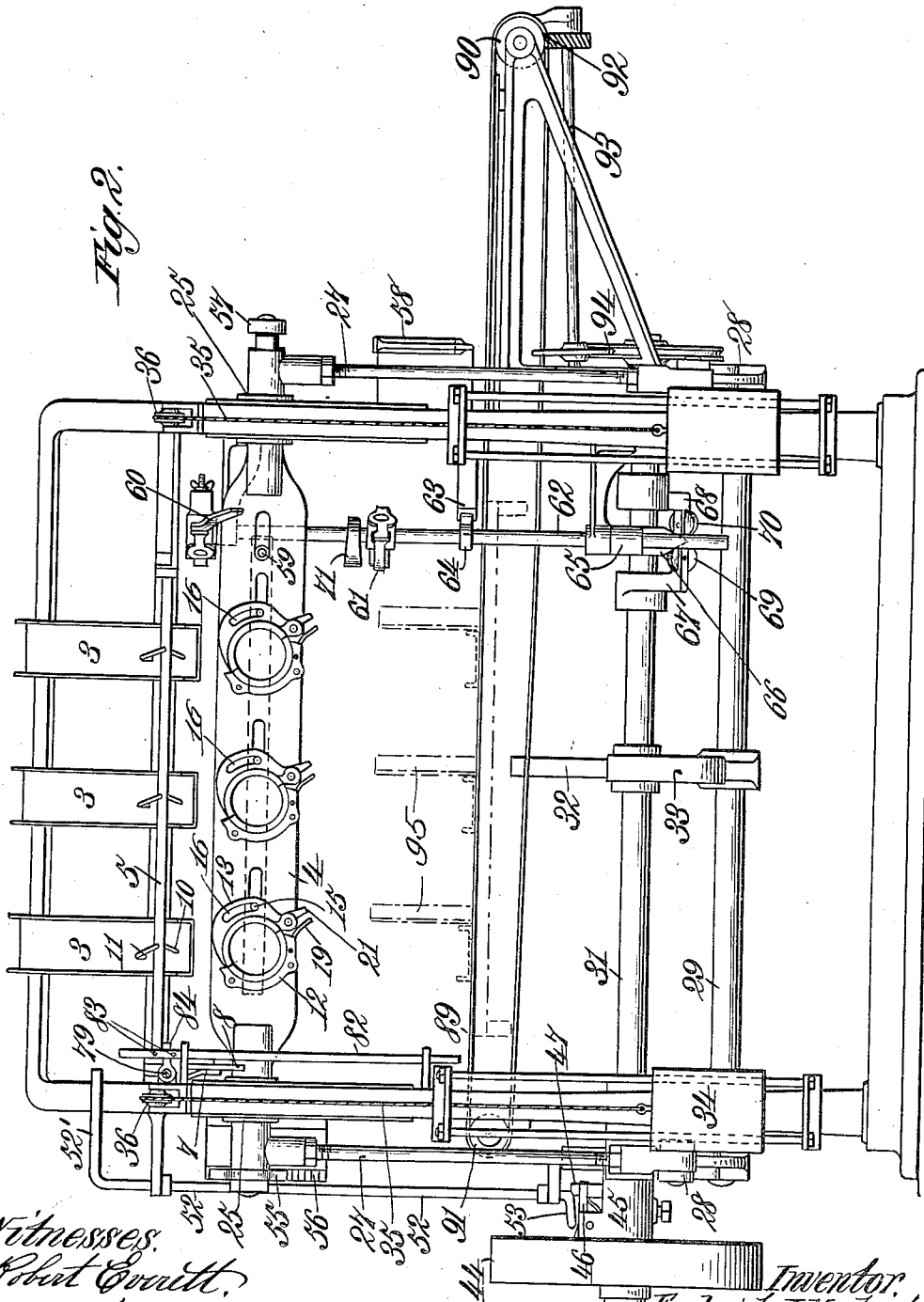




F. J. HEYBACH.  
CAN CAPPING MACHINE.  
APPLICATION FILED SEPT. 11, 1906.

935,505.

Patented Sept. 28, 1909.  
6 SHEETS—SHEET 2.



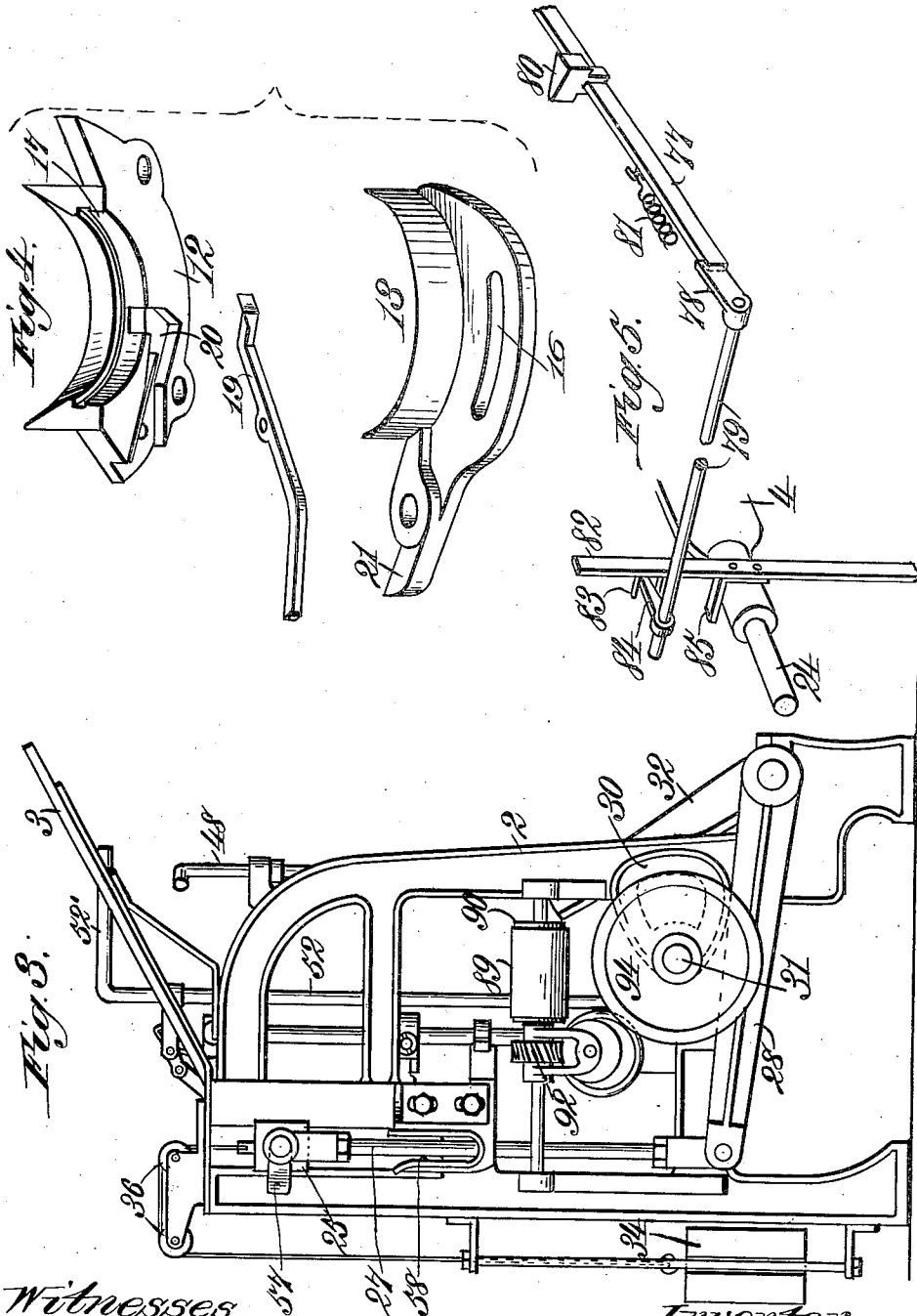
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6 SHEETS—SHEET 3.



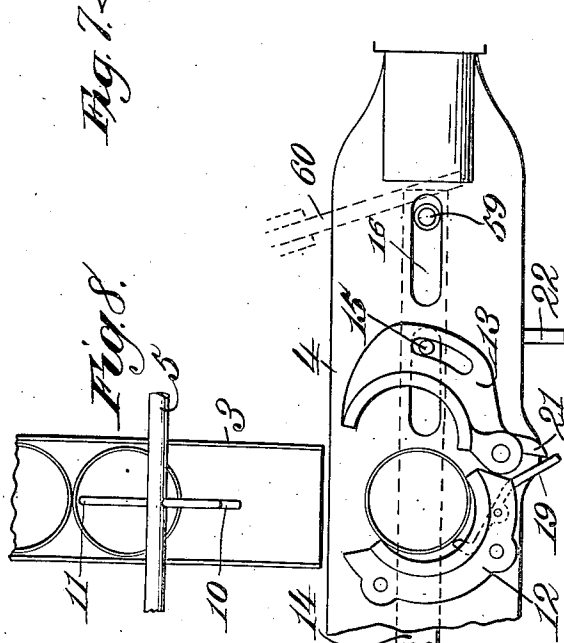
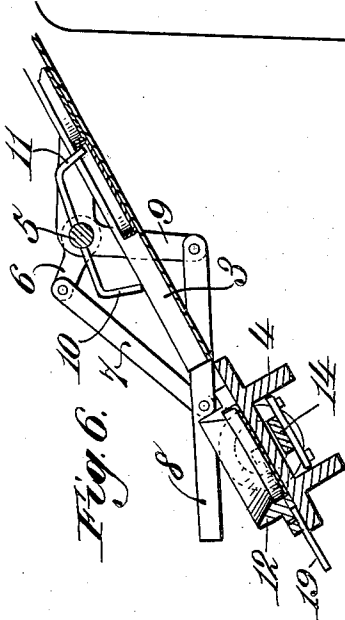
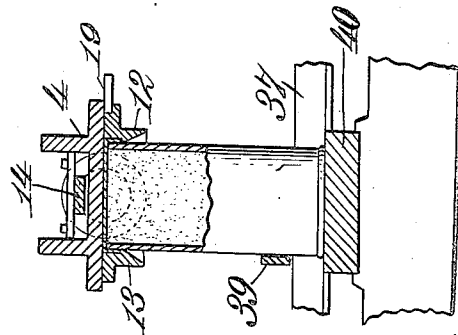
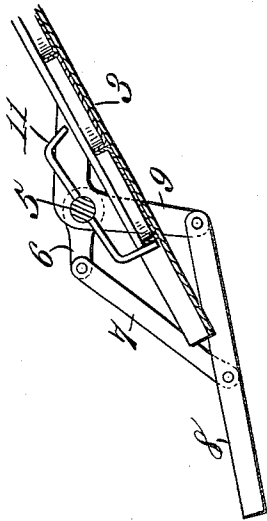
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935,505.

Patented Sept. 28, 1909.  
6 SHEETS—SHEET 4.



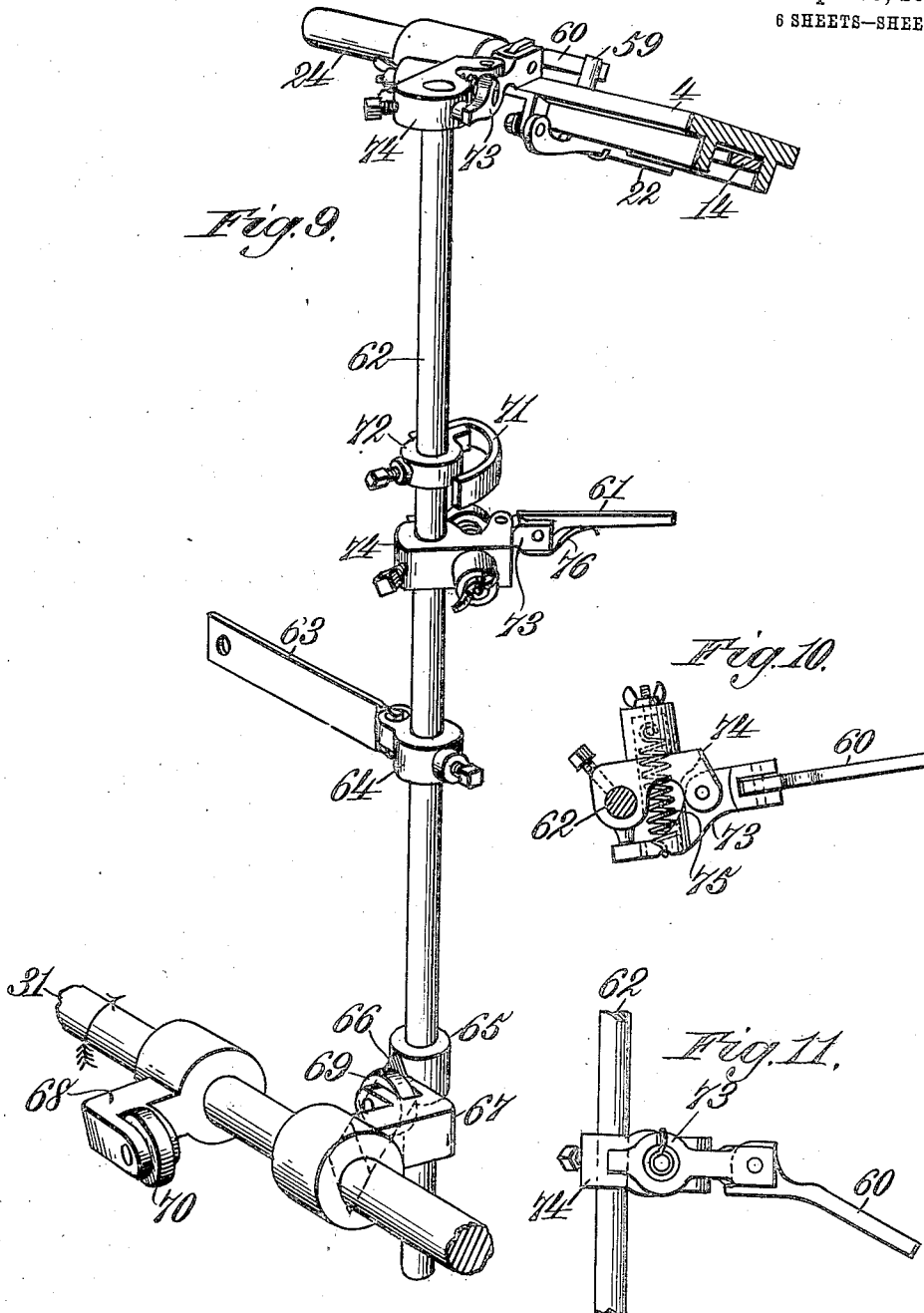
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935,505.

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APPLICATION FILED SEPT. 11, 1906.

Patented Sept. 28, 1909.  
6 SHEETS—SHEET 5.



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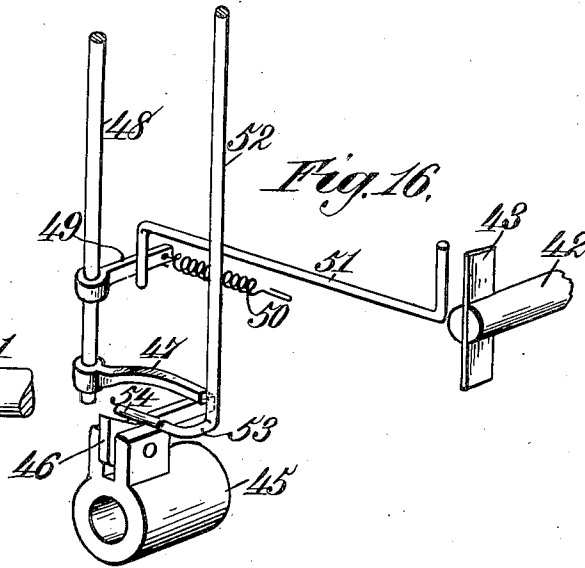
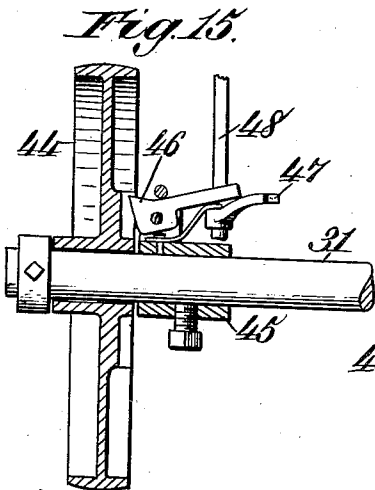
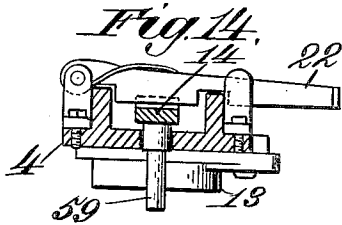
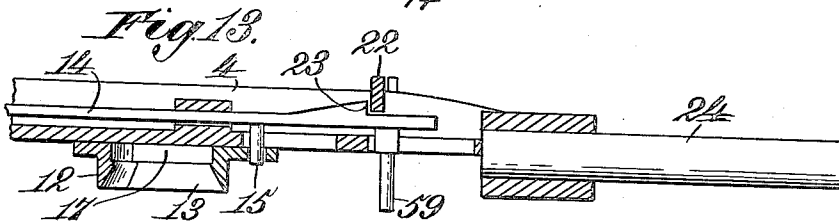
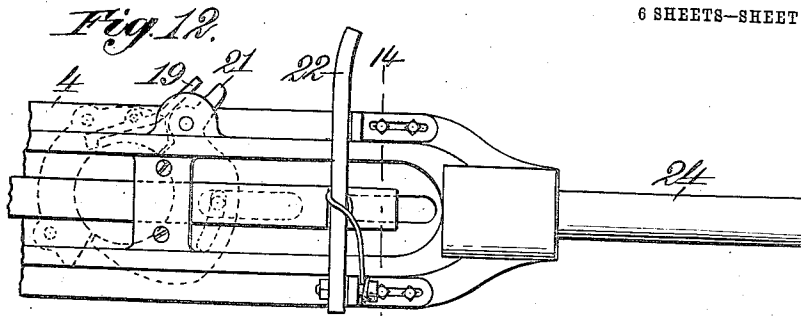
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F. J. HEYBACH.  
CAN CAPPING MACHINE.  
APPLICATION FILED SEPT. 11, 1906.

935,505.

Patented Sept. 28, 1909.

6 SHEETS—SHEET 6.



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# UNITED STATES PATENT OFFICE.

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## CAN-CAPPING MACHINE.

935,505.

Specification of Letters Patent. Patented Sept. 28, 1909.

Application filed September 11, 1906. Serial No. 334,179.

*To all whom it may concern:*

Be it known that I, FREDERICK J. HEYBACH, a citizen of the United States, residing at Savannah, in the county of Chatham and State of Georgia, have invented new and useful Improvements in Can-Capping Machines, of which the following is a specification.

This invention relates to can capping machines. I use this title as a convenient one and for the reason that I show a machine adapted particularly for applying caps or tops to cans. The machine may be used with equal advantage for putting covers onto receptacles other than cans, and therefore where I hereinafter use the designation can, I do so in a broad sense to include other receptacles, the same applying to the term cap which is intended to include other covers.

A machine involving my invention is effective, rapid and accurate in action and in the present case is wholly automatic, although some of the operations may be accomplished by hand. For example, where I illustrate means for positively supplying cans into positions to receive caps, such cans may be put in such positions by an operator. In combination with the capping apparatus I employ means for supplying charges to the cans, and such means may consist of weighing apparatus such as that disclosed in Letters-Patent No. 791,342 granted to me on May 30, 1905, and to which reference may be had.

In the drawings accompanying and forming a part of this specification I show in detail a simple form of embodiment of apparatus embracing my invention, which to enable those skilled in the art to practice the invention, will be fully set forth in the following description, while the novelty of said invention will be included in the claims succeeding said description. Various modifications in structure may be adopted within the scope of my said claims.

Referring to the drawings, Figure 1 is a side elevation of said apparatus. This figure also shows in dotted lines means for supplying cans to the capping apparatus, and means for delivering charges of material to the cans. Fig. 2 is an elevation of the capping apparatus looking in the direction of the arrow in Fig. 1. Fig. 3 is a side elevation of said apparatus from the

side opposite that appearing in Fig. 1. Fig. 4 is a detail perspective view of a cap clamp. Fig. 5 is a similar view of controlling mechanism for the charging apparatus. Fig. 6 is a sectional view of escapement means and top carrier, the latter being in position to receive a top. Fig. 7 is a similar view, the escapement means and cap carrier being in different positions, and the cap carrier being in the act of applying a cap to a can which with its support and certain adjunctive devices are also shown in said figure. Fig. 8 is a top plan view of the parts shown in Fig. 6 and in positions corresponding therewith. Fig. 9 is a perspective view of an oscillatory shaft or spindle, cap carrier, means for turning said spindle and certain other parts coöperative with the spindle. Fig. 10 is a top plan view of the upper finger shown in Fig. 9, and Fig. 11 is a side elevation of the same. Fig. 12 is a bottom plan view of one end of the cap carrier. Fig. 13 is a longitudinal sectional view of the same. Fig. 14 is a transverse sectional view on the line 14-14 of Fig. 12. Fig. 15 is a detail view in perspective of certain clutch mechanism, and Fig. 16 is a similar view of controlling and actuating means for said clutch mechanism.

Certain of the figures are on an enlarged scale.

Like characters indicate corresponding parts throughout the several figures.

The framework for supporting the different parts of the capping apparatus as well as the can charging apparatus may be of any desirable character. The framework for such purpose shown in the drawings is designated in a general way by 2 and consists of a base or bed from which rise at intervals transversely connected uprights or posts.

In Fig. 2 of the drawings I have shown three inclined chutes or ways 3 which as shown in Figs. 1, 3, 6 and 7 are inclined. These ways are for the travel of the caps or tops which are to be applied to the cans, the caps or tops passing from said chutes or ways 3 onto a cap carrier as 4. This carrier as will hereinafter appear is in the present case bodily movably mounted by virtue of which it can apply the caps to a series of cans, for which reason the part 4 constitutes really a cap carrying and applying device

or a cap transferring and applying member. I have shown as stated three of these chutes, and it therefore follows that the cap carrying and transferring device 4 has provision for positively holding as by clamping means a corresponding number of caps. The number of chutes, however, may be varied; in fact, I need to employ but one of them. The caps are put into the upper ends of the chutes 3 by the attendant of the machine and gravitate along the same, the delivery of caps to the cap transferring and applying device being controlled by escapement means shown in detail in Figs. 6 and 7. Referring now particularly to these two figures, the numeral 5 represents a rock-shaft supported by the framework of the machine, and to which is fastened a rock-arm 6 extending toward the front of the machine. To the forward end of this rock-arm 6 is shown pivoted the upper end of a link 7, the opposite end of said link being represented as likewise jointed to a lever 8 between the ends of said lever. The rear end of said lever is fulcrumed upon a bracket 9 forming part of the framing of the machine.

I will now describe in detail the construction of one of the escapement means.

There are represented as extending oppositely from the shaft 5 the detents 10 and 11 represented as consisting of angularly disposed arms, the downwardly deflected or bent branches of which constitute the effective portions of said detents or arms. In Fig. 7 the detent 10 is represented as occupying its effective position while the detent 11 is represented as being in an inoperative relation. With the two detents or arms in this position the downwardly bent or hooked portion of the detent or arm 10 will be in front of the foremost cap of a series of caps in the cooperating chute 3, so as to prevent the caps from descending along said chute, the cap carrying and transferring device 4 at this time being down. When the cap carrying and transferring device 4 rises, as will hereinafter appear, it will when its upward motion is practically completed strike against the lever 8 so that on the completion of said upward motion, the lever 8 will be lifted to carry the detent 10 out of engagement with or out of the path of the foremost cap in said chute and to simultaneously cause the detent 11 to enter the second cap in said chute. The instant that the first cap is released by the detent 10, and this occurs when the part 4 is in its cap receiving position, said first cap will be free to travel down the chute and enter upon said part 4. What was the second cap will then be the first cap, although said second cap will still be upheld by the detent 11, as shown in Fig. 6. When the cap transferring and applying device 4 descends it moves away from

the lever 8 thereby permitting said lever to drop, this operation on the part of the lever being an automatic one, so as to cause the detents 10 and 11 to move into the position shown in Fig. 7, whereby what was at the start the second cap can travel down to the position occupied by what I have described as the first cap. The operation of the detent or escapement mechanism is wholly automatic and said mechanism effectively controls the delivery of caps to the cap transferring and applying member 4. There are three of the detents 10 and three of the detents 11 on the shaft 5 and they operate together; that is, all three detents 10 approach their effective positions simultaneously and recede therefrom simultaneously, while the same applies to the three detents 11.

The cap transferring and applying member 4 is shown as composed of an elongated body having on what might be considered its upper side, as that part thereof is normally up in Fig. 6, three clamping devices for caps, each in the present case comprising a fixed or stationary jaw 12 and a movable jaw 13, the movable jaws 13 being represented as pivoted to the said part 4 and as simultaneously operable by a slide as 14. This slide 14 is represented as having three pins 15 movable in longitudinal slots in the part 4 and adapted to enter arcuate slots as 16 in the several movable jaws 13. In Fig. 8 I have shown the jaw 13 as open and a top or cap in position to be clamped between the jaws. When the slide 14 is moved toward the left in Fig. 8 the jaw 13 will be closed so that it can with the cooperating jaw clamp the cap therebetween. The jaws 12 and 13 are rabbeted as at 17 so that when closed there will be an annular space in which the cap may fit, as clearly shown in Fig. 3. There will naturally be formed a shoulder which supports the cap when the part 4 is inverted, as will hereinafter appear. A cap kicking device 19, see for example Figs. 4 and 8, is pivotally supported between its ends in a notch as 20 in the under side of the stationary jaw 12. I deem it expedient to state at this point that I am describing in detail one clamping means. The movable jaw 13 is provided with an extension 21 which when said movable jaw is open presses against the tail of the cap kicking device 19, so as to hold the same in the position shown in Fig. 8. When the jaw 13 is closed the extension 21 will be out of contact with the tail of the cap kicking member 19, so that the inner end of said member 19 can occupy a position flush or substantially flush with the vertical part of the rabbet 17 in said jaw 12, by reason of which the cap can be properly seated in the registering rabbets 17 when the jaw 13 is closed. When the jaw 13 is opened the extension 21 will

strike against the tail of the cap kicking or ejecting device 19 and will cause the inner end of said part 19 to free the cap from the stationary or fixed jaw 12, whereby the cap carrying and applying member can freely return to its normal position or that shown in Fig. 6.

The rabbeting of a can clamping device as previously set forth produces a shoulder or seat upon which a cap may rest. The jaws of the can clamping device are outwardly flared as at 13'. The flared portions when the two jaws are closed together mate to present a conical guide portion which is adapted to receive the upper end of a can body when the cap carrying and transferring device is down, or is in its cap applying position, by reason of which said can body can be properly or accurately centered with respect to the cap. From this it will be understood that I provide a suitable member having a pair of top receiving jaws provided with complementary top supporting seats, and an outwardly flared mouth leading from the seat and arranged to receive the end of a can, said outwardly flared mouth constituting one effective means for centering said can body.

The slide 14 is suitably guided on the under side of the cap carrying and transferring device 4 and when the same is in an advanced position or that to which it has moved for shutting simultaneously the three jaws 13 it will be held positively in such position, for example, by means of a spring actuated latch as 22 (see Figs. 12 and 13) pivotally carried upon the under side of said part 4 and adapted when in its operative position to engage behind a shoulder as 23 on said slide. Just before the cap carrying and transferring device 4 reaches its extreme shifted or downward position, the latch 22 is tripped as will hereinafter appear in order to release the slide 14 and permit the latter to be retracted, during which motion the jaws 13 are simultaneously opened. The cap carrying and transferring device 4 is provided at its opposite ends with trunnions 24 supported for rocking motion by bearing blocks as 25 mounted for reciprocatory and sliding motion in guide slots as 26 formed in the framework of the machine. To these trunnions are connected rods as 27, the lower ends of which are connected with the rear ends of arms as 28 carried by the rock shaft 29 fulcrumed upon the framework of the machine. Each of the arms 28 is engageable by a cam as 30 on the intermittently rotating shaft 31 supported by suitable bearings upon the frame of the machine. The cams 30 are of duplicate construction and by acting against the two arms 28 serve to swing said arms downward in order to lower, through the intermediate parts, the cap carrying and trans-

ferring device 4, the latter during such downward motion being turned to invert the same or bring it into its cap applying position. The shaft 29 carries a third arm as 32 engageable by a cam as 33, when the cams 30 have served their function of lowering the arms 28. The cam 33 by acting against the arm 32 serves through the intermediate parts to elevate the cap carrying and transferring device 4, during which motion the latter is turned over so that when the upward motion is completed said device will be in proper position to receive a series of caps. It might be remarked that the two cams 30 and the cam 33 are at rest in Fig. 1, and all are fixed to the shaft 31.

The cap carrying and transferring device 4 has counterbalancing means connected therewith as suitably guided weights 34, from which extend upward cords as 35 connected with the cap carrying and transferring device 4 and passing respectively between the ends thereof over antifriction rollers as 36 on the framework of the machine. These weights 34 aid the cam 33 in lifting the cap carrying and transferring device 4.

The cans are moved along suitable ways as 37 by means of an endless apron as 38 provided with slats as 39 for such purpose. The can feeding means composed of the apron 38 and its slats 39 conduct the cans to a place where caps may be applied thereto and after the said cans have been filled. When the cans are being capped they rest upon a cross piece as 40 (see Fig. 7) which takes up the strain put upon the cans when the caps are being applied thereto. I have shown the forward end of the apron 38 as extended around a drum as 41, the shaft 42 being provided with means such as the wings 43 for causing a clutch hereinafter described to operate. This feed apron 38 does not of itself form any part of the present invention, but is disclosed substantially in certain other applications filed by me, one of which was filed January 23, 1905, Serial No. 242,376, and another of which was filed April 11, 1906, Serial No. 311,157. The apron 38 like the corresponding part set forth in the applications just referred to is given a step-by-step movement and on each step thereof one of the wings 43 is adapted, through intermediate parts, to effect the release of said clutch mechanism.

The shaft 31 to which I have hereinbefore referred carries some suitable type of continuously operable member as the pulley 44 which runs loose on the shaft, but which is adapted to be intermittently clutched thereto, as will now appear. On the shaft 31 adjacent to the pulley 44 is fastened a collar 45 which pivotally carries a spring actuated pawl as 46, the spring of which serves to move the operative end of the pawl into en-

gagement with the pulley 44 so as to clutch said pulley to the shaft 31 and cause the rotation of the latter. The pawl 46 is normally held in its inoperative relation by a detent as 47 fastened to the lower end of the vertically disposed spindle 48 supported by suitable brackets on the framing of the machine. To this spindle is attached a rock arm 49 to which is connected one end of a spring 50, the opposite end of said spring being connected to the framework of the machine. Coöperative with this arm 49 is a push member as 51 for transferring alternately the effect of the wings 43 to the arm 49. The normal relation of the parts just described is illustrated in Fig. 16, the pawl 46 being out of engagement with the pulley 44 and being thus held by the detent 47. It will be assumed that the upper wing 43 is in the act of thrusting the push rod 51 toward the left in said figure, the shaft 42 at this time turning. As the rod 51 thus moves the detent 47 is caused by the rod 51 striking against the arm 49 to pass free of the pawl 46 so that the latter by the power of its spring can be caused to engage the pulley 44 for clutching said pulley to the shaft 31, at which time the shaft is caused to rotate. The instant that the wing 43 passes out of contact with the rod 51 the rod, arm 49 and detent 47 are returned to their original positions by means of the spring 50, whereby when the pulley has made practically one full turn the tail of the pawl 46 will be carried under the detent 47 so that the latter can trip the pawl and disengage it from the pulley 44, when the latter has made one complete turn by reason of which further movement of the pulley is prevented until the same is connected with said pawl 46 through the primary action of a wing 43, as previously described. The spindle 48 has a suitable handle as 48' at its upper end, whereby the same and consequently the detent 47 can be manually operated. In addition to the spindle 48 there is a second spindle 52 provided at its base with an off-turned foot 53 equipped with a lateral projection 54 which during the normal operation of the machine lies perpendicularly above the center of motion of the pawl 46. This spindle 52 provides a means for throwing the shaft 31 out of action, for the spindle 52 can be turned to carry the lateral extension 54 over the tail of the pawl 46 so as to prevent said pawl from being thrust into engagement with the pulley 44 by the power of its spring when said pawl is released by the detent 47. The spindle 52 is illustrated as provided at its upper end with a handle 52', by which it can be readily turned. When, therefore, the shaft 31 is rotated or given one complete turn the cap carrying and transferring device 4 is moved from its upper to its lower position and is then returned to said upper

position by the action of the two cams 30 and the single cam 33, as hereinbefore described. During the downward motion of the said cap carrying and transferring device 4 the same is turned from the position in which it is represented as occupying in Fig. 6 to that shown in Fig. 7, so as to bring it in proper relation to apply the several caps clamped thereon to the row of cans resting upon the beam or strip 40, and I will now describe the means shown for this purpose. One of the trunnions 24, or that which is represented in the foreground in Fig. 1, has fastened there-to a toothed segment 55, the teeth of which are adapted to mesh with the teeth of a rack-bar as 56 fastened upon the frame of the machine.

When the cap carrying and transferring device is drawn down the same is, through the mesh of the parts 55 and 56, given the necessary turn, the inversion of the said part 4 being concluded when the segment 55 passes out of engagement with the rack bar 56. The cap carrying and transferring device, however, has a further downward movement beyond this point and during this downward movement means such as those now to be described are provided for preventing accidental turning motion of the part 4. Upon the trunnion 24 shown in the foreground in Fig. 3 is a polygonal extension 57 shown as rectangular and which is adapted to enter the upper open end of the slot or aperture 58 in the framework of the machine just at the time the segment 55 passes out of engagement with the rack bar 56. The extension 57 is shown as horizontally disposed in Fig. 3, the part 4 at this time being nearly up. When said part 4, however, is turned the extension 57 will hang down in a vertical position so that it can enter the slot 58 and then ride down the same, the upper end of said slot being laterally widened to facilitate the entrance of the extension 57 thereinto. On the upward movement of the part 4 and when a certain distance has been traversed the extension 57 will pass out of the slot 58 and the teeth of the segment or sector 55 will engage the teeth of the rack bar 56 to reverse the position of the cap carrying and transferring device, the reversal of movement being completed when said part 4 reaches its extreme upper position.

After the several caps are delivered onto the cap carrying and transferring device 4, the jaws 13 thereof are closed and following this the lowering of said cap carrying and transferring device takes place and just before the downward movement of the device 4 is completed said jaws 13 are released so that they can be opened and the advantageous means shown in the drawings for securing these functions will now be set forth. The jaws 13 are opened and closed by the

movement of the slide 14 which has a pin 59 extending through a longitudinal slot in the cap carrying and transferring device 4 and which is alternately engageable by the fingers 60 and 61 yieldingly connected with the vertically disposed shaft 62 as will hereinafter appear. This shaft 62 has opposite movements from the central or intermediate position which it is shown as occupying in Fig. 9. This normal relation of the shaft 62 is represented as maintained by a flat spring as 63 connected at one end with the framing of the machine, and the other end thereof fitting a notch or recess in the collar 64 fastened to said shaft which is sustained for oscillation by suitable bearings on the framework. The shaft 62 is represented as provided with a second collar 65 below the first collar 64. The collar 65 has an extension or projection 66 of diamond form in cross section and operable alternately by arms as 67 and 68 fastened to the shaft 31, said arms being shown as equipped with anti-friction rollers 69 and 70 respectively for directly engaging the periphery of said diamond-shaped projection 66.

It will be assumed that the cap carrying and transferring device 4 is in the position shown in Fig. 6, that three caps have been supplied thereto, and that the shaft 31 has been thrown in operation. On the initial movement of the shaft 31 the anti-friction roller 69 will be caused to ride successively along the two inclined faces on one side of the diamond-shaped projection 66. As the anti-friction roller 69 travels down the upper of said faces the shaft 62 is given a turn so as to cause the finger 60 to operate the pin 59 in a direction to move the slide 14 for simultaneously closing the three jaws 13 for the purpose of clamping the caps as hereinbefore described. When the jaws are closed the latch 22 will automatically engage behind the shoulder 23 to prevent accidental opening of the jaws. When the roller 69 rides down the second or lower inclined face on one side of the diamond-shaped projection 66 the result is that the shaft 62 is released and can be returned to its central position by the power of the spring 63 which, as will be understood, was tensioned on the initial movement of said shaft 62. After the jaws 13 are locked closed the cams 30 become effective for lowering the cap carrying and transferring device 4 as hereinbefore described. Just before the cap carrying and transferring device 4 reaches the limit of its downward movement, the same having in the meantime been inverted, the tail or free portion of the latch 22 strikes against the trip device 71 for the purpose of disengaging said latch from the slide 14, the disengagement being effected when the part 4 has completed its downward movement, by reason of which the jaws 13 can be opened

by the operation of the finger 61 against the pin 59. The trip device 71 is shown as a curved strip fastened to the collar 72 suitably fixed to the shaft 62. After the latch 22 has been disengaged from the slide 14, the shaft 31 at this time being in rotation, the anti-friction roller 70 is caused to ride against the upper left inclined face of the projection 66 (see Fig. 9) so as to turn the shaft 62 in the direction to carry the finger 61 against the pin 59 for retracting the slide 14 and thereby, as will be understood, opening the three jaws 13, the caps at this time having been applied to the three cans, owing to the fact that the device 4 has completed its downward movement. The caps are wholly freed from the jaws, as hereinbefore described, as soon as the jaws 13 are opened. When the anti-friction roller rides down the lower left face of the projection 66 the shaft 62 can be returned to its original or central position by the power of the spring 63.

The two fingers 60 and 61 have a yielding motion in a direction opposite that in which their effect is applied to the pin 59, so that in case any obstruction is encountered by the slide 14 and jaws 13 no injury can result, and the mounting for this purpose is shown in detail in Figs. 10 and 11, wherein the upper one of the two fingers 60 and 61 is shown. The other finger is similarly mounted. The finger 60 is pivoted to a part 73 which in turn is pivoted to a block 74 fastened suitably to the shaft 62. A spring 75 is interposed between the pivoted member 73 and the block or collar 74, such spring 75 serving to conveniently hold the finger 60 yieldingly in its operative position. The detailed description of the finger 60 and its immediate adjuncts applies to the lower finger 61, for which reason corresponding characters will be used to designate similar parts in the two. In addition to the spring 75 I may as a further precaution provide springs as 76 for holding the fingers 60 and 61 yieldingly in place, the springs 76 acting transversely to the springs 75, and their presence avoiding injury by the fingers striking the part 4.

In application No. 311,157 is disclosed an endwise movable clutch controlling member and I have shown in the drawings such an endwise movable clutch controlling member, the same being designated by 77 and being shown clearly in Fig. 5. This clutch controlling member 77 forms in itself no part of the present invention, for which reason it is unnecessary to describe in detail the operation of the same and the parts in practice that immediately cooperate therewith for these are fully brought out in the application to which I have last referred. This clutch controller 77 is normally held against movement by a detent as 78 on one end of the shaft 79 carried for rocking motion by

bearings upon the framing of the machine. In the application last referred to, the clutch controller has a wedge thereon, this wedge being shown in the drawings and being denoted by 80. This wedge in the application last referred to is engaged by another wedge on a power operated member, the construction being such that when the wedge on the clutch controlling device is released by the wedge on the power operated member the clutch controlling device can be given its advancing stroke such as by a spring, which spring I illustrate in the drawings and designate by 81. On the advancing stroke of the clutch controlling member a clutch is thrown in action for setting in operation tapping mechanism and can feeding means as well as means for returning said power operated member to its original position for repeating the weighing operations. By governing the operation of the member 77 I govern also as will be apparent the action of the weighing apparatus which I use for charging the empty cans. When the detent 78 is disengaged from the clutch controlling device 77, the latter may be given its advancing movement by the power of its spring 81 to throw into action a clutch, as fully brought out in the application to which I have last referred.

Upon the framework of the machine is suitably guided for vertical movement a rod 82 having on one side thereof parallel pins as 83 to freely receive between them an arm as 84 carried by the rock shaft 79 in line with the detent or arm 78. On this rod 82 below the pins 83 is a projection 85 in position for engagement by the cap carrying and transferring device 4, the parts being so related that when the cap carrying and transferring device has practically completed its upward movement it strikes against the projection 85 and thrusts the rod 82 upward moving the arm 84 in a corresponding direction and through the shaft 79 lifting the detent 78 clear of the clutch controlling member 77 so that the latter can be given its advancing stroke by the power of the spring 81. In dotted lines in Fig. 1 of the drawings the charging apparatus for the cans may consist of weighing apparatus such as that disclosed in Letters-Patent to which I have hereinbefore referred, the bucket of one of which is shown in Fig. 1 and is denoted by 86. These buckets deliver their charges into hoppers as 87, which direct them into the empty cans movable step-by-step along ways as 37, the substance when in the cans being solidified therein by tapping mechanism, one element of which appears in dotted lines in said Fig. 1 and is a mutilated toothed wheel 88.

The filling machine forms no part of the present invention as claimed, but it has been diagrammatically illustrated and briefly de-

scribed in order that a more intelligent understanding of the construction and operation of the complete machine may be had.

Filled and capped cans are delivered by the step-by-step moving apron 38 onto an endless belt as 89 passed around pulleys as 90 and 91 on the framework of the machine (see Fig. 2), the shaft of the pulley 90 being connected by worm gearing denoted in a general way by 92 with a shaft 93 which in turn is connected by friction gearing denoted in a general way by 94 with the intermittently rotative shaft 31 by which it will be apparent that the movement of the belt 89 is a step-by-step one. Between the transversely movable apron 38 and endless belt 89 are several curved and vertically disposed plates as 95, the purpose of which is to positively sweep the filled and capped cans from out of the range of action of the apron 38.

Briefly set forth the operation of the capping apparatus is as follows: In Figs. 1, 3, 6 and 8 the parts are represented as occupying their normal positions and it will be assumed that at this time there is a row of filled cans on the supporting means, strip or beam 40. The cap carrying and transferring device 4 will therefore contain three caps. When the shaft 31 is thrown into action, as hereinbefore set forth, the three jaws 13 are moved to their closed positions and against the stationary jaws 12, after which the cap carrying and transferring device is lowered. During the downward movement of the cap carrying and transferring device the same is inverted so that as shown in Fig. 7 it can properly apply the caps to the filled cans. When the caps have been applied the jaws 13 are opened and the caps are positively freed from their seats in the stationary jaws, all as previously set forth. Following this, the cap carrying and transferring device is elevated to repeat the operation and to permit the entrance therinto of a series of caps when said cap carrying and transferring device has reached its extreme upper positions, as hereinbefore set forth.

What I claim is:

1. In an apparatus of the class described, a cap carrying and transferring device and mechanism for bodily reciprocating said cap carrying and transferring device and for turning the same independently of and during the said reciprocatory movement.

2. In an apparatus of the class described, a cap carrying and transferring device bodily movable from an upper to a lower position and also capable of turning movement independently of said other movement.

3. In an apparatus of the class described, a cap carrying and transferring device, mechanism for bodily moving the cap carrying and transferring device from an upper to a lower position and for then returning the same, and independent means for turn-

ing said cap carrying and transferring device.

4. In an apparatus of the class described, a cap carrying and transferring device, mechanism for moving the same from an upper to a lower position and then returning the same, a gear member connected with the cap carrying device, and an independent gear member meshing with the other gear member and serving to turn the cap carrying and transferring device during the downward motion thereof.

5. In an apparatus of the class described, a cap carrying and transferring device, mechanism for moving the same from an upper to a lower position and then returning the same, a gear member connected with the cap carrying device, an independent gear member meshing with the other gear member and serving to turn the cap carrying and transferring device during the downward motion thereof, the first gear member being adapted to pass out of mesh with the second gear member at a predetermined point in the descent of the cap carrying and transferring device, and means for preventing accidental turning movement of the cap carrying and transferring device when the first gear member is out of mesh with the second gear member.

6. In an apparatus of the class described, a cap carrying and transferring device, mechanism for moving the cap carrying and transferring device from an upper to a lower position and for then returning the same, a toothed segment connected with the cap carrying and transferring device, and a stationary rack bar, the teeth of which mesh with those of the segment for turning the cap carrying and transferring device on the downward movement thereof, the framework having a slot, and the cap carrying device having a member to enter said slot for preventing turning motion of the cap carrying and transferring device when the segment passes out of mesh with the rack bar.

7. In an apparatus of the class described, a cap carrying and transferring device, vertically slidable bearings, the cap carrying and transferring device having trunnions supported for turning motion by said bearings, a toothed segment fixed to one of the trunnions, a stationary rack bar, the teeth of which are adapted to mesh with those of the segment for turning the cap carrying and transferring device on the downward movement thereof, a polygonal projection connected with the cap carrying and transferring device, the framework having a slot to receive said projection when the segment passes out of mesh with the rack bar to thereby prevent accidental movement of the cap carrying and transferring device, and means for moving the cap carrying and

transferring device downward and then upward.

8. In an apparatus of the class described, a counterbalanced cap carrying and transferring device, mechanism for moving the same downward and then upward, and means for positively turning said cap carrying and transferring device during its downward movement.

9. In an apparatus of the class described, a cap carrying and transferring device, counterweight means connected with the said cap carrying and transferring device and tending normally to elevate the same, cam mechanism for moving the cap carrying and transferring device downward and then upward, and means for turning the cap carrying and transferring device during the downward motion thereof.

10. In an apparatus of the class described, a cap carrying and transferring device capable of applying caps to receptacles, mechanism for bodily moving the cap carrying and transferring device from a cap receiving to a cap applying position, means for supplying caps to said cap carrying and transferring device when the same is in its cap receiving position, and means operable by the cap carrying and transferring device for controlling the feed of caps thereto.

11. In an apparatus of the class described, a cap carrying and transferring device capable of directly applying caps to receptacles, mechanism for bodily moving the same from a cap receiving to a cap applying position, a chute to supply caps to the cap carrying and transferring device, two detents controlling the feed of the caps along the chute, and means operable by the cap carrying and transferring device to move one of the detents into an effective or cap arresting position and the other into an ineffective or cap releasing position.

12. In an apparatus of the class described, a cap carrying and transferring device, mechanism for moving the same from a cap receiving to a cap applying position and then returning the same to said cap receiving position, a chute for supplying caps to the cap carrying and transferring device, a shaft, oppositely disposed detents connected with the shaft for controlling the feed of the caps along said chute, an arm on the shaft, a lever, and a link extending between said lever and arm, the cap carrying and transferring device as it moves toward its upper position serving to operate the lever and thereby, through the intermediate connections, said shaft to move one of the detents into an operative position and the other into an inoperative position.

13. In an apparatus of the class described, the combination of a cap-supplying device, means for supporting a can in upright position, and a reciprocatory cap-transferring

device capable of movement between said cap-supplying device and can support and having means for inverting its position while reciprocating between the cap-supplying device to a can on the can support.

14. In an apparatus of the class described, an inclined cap-supplying chute, means for supporting a receptacle in cap-receiving position, a device for transferring caps from said chute and applying them to the receptacle, said device being provided with jaws capable of being operated to provide a lateral opening to receive a cap from said chute and constituting when closed a cap clamp, means for bodily moving said device from a cap-receiving to a cap-applying position, means for inverting the position of said device while moving from a cap-receiving to a cap-applying position, and means for opening said jaws to receive a cap from said chute.

15. In an apparatus of the class described, a cap carrying and transferring device provided with a clamp comprising jaws, jaw operating means to cause the clamp to clamp and then unclamp a cap, mechanism for reciprocating the cap carrying and transferring device, and independent means for turning the same during reciprocation.

16. In an apparatus of the class described, a cap carrying and transferring device having can clamping means comprising a movable jaw, means for reciprocating and for also inverting said cap carrying and transferring device, and means for operating said movable jaw to clamp a cap before the cap carrying and transferring device is inverted and for operating said movable jaw after said cap carrying and transferring device is inverted to unclamp said cap.

17. In an apparatus of the class described, a cap carrying means provided with a cap clamp comprising a movable jaw, a shaft having fingers for operating said movable jaw in opposite directions, and means for positively turning the shaft oppositely from a central position.

18. In an apparatus of the class described, a cap carrying means provided with a cap clamp comprising a movable jaw, a shaft having fingers for operating said movable jaw in opposite directions, means for oppositely turning the shaft alternately from a central position, and yieldable means for holding said shaft positively in said central position.

19. In an apparatus of the class described, a cap carrying means having a cap clamp comprising a movable jaw, a shaft having fingers for moving said jaw in opposite directions alternately to clamp and unclamp a cap, a rotary shaft provided with a projection having faces inclined toward each other, an arm on said second shaft to engage one of said inclined faces to move the

first mentioned shaft in one direction from a central position, a second arm on said shaft for engaging another of said inclined faces for moving said shaft in an opposite direction from said central position.

20. In an apparatus of the class described, cap carrying means provided with a cap clamp comprising a movable jaw, yieldably mounted fingers for alternately operating said movable jaw to clamp and unclamp a cap, a shaft to which said fingers are connected, means for operating the shaft alternately in opposite directions from a central position, and means for positively holding said shaft normally in said central position.

21. In an apparatus of the class described, a cap carrying and transferring device provided with a cap clamp comprising a movable jaw, mechanism for moving the cap carrying and transferring device from an upper to a lower position and for also inverting said cap carrying and transferring device during its downward motion, a shaft provided with means for operating the jaw to move the same into cap clamping and cap releasing positions in succession, a latch on the cap carrying and transferring device for holding said jaw in cap clamping relation, and a trip device on said shaft for operating said latch to release said movable jaw when the cap carrying and transferring device has substantially reached its lowest position.

22. In an apparatus of the class described, a cap carrying and transferring device provided with a clamp consisting of a fixed and a pivoted jaw, means for moving said pivoted jaw toward and from the fixed jaw to successively clamp and unclamp a cap, and mechanism for bodily moving said cap-carrying and transferring device after a cap is gripped by the clamp held thereby.

23. In an apparatus of the class described, a cap carrying and transferring device provided with a cap clamping member having a stationary and a pivoted jaw provided with rabbets which mate to form a cap seat when the pivoted jaw is closed against the stationary jaw, means for moving the pivoted jaw toward and from the stationary jaw to successively clamp and unclamp the cap, and mechanism for bodily moving said cap-carrying and transferring device after a cap has been clamped by said clamping member and a kicker carried by the stationary jaw, the pivoted jaw having means for operating said kicker to cause the latter to disengage the cap from the stationary jaw when the pivoted jaw is opened.

24. In an apparatus of the class described, a cap carrying and transferring device movable from an upper to a lower position, mechanism for reciprocating the said cap carrying and transferring device, a clutch controller, a detent for normally holding the clutch controller against action, means for

positively actuating the clutch controller when the same is released by said detent, and means operable by the said cap carrying and transferring device for operating the detent in a direction to release the clutch controller when said cap carrying device reaches its uppermost position.

25. An apparatus of the class described comprising a cap-feeding chute, a can support, a device reciprocable between said chute and the can support and capable of receiving a cap from the chute and transferring and applying it to a can on said support, and means for automatically inverting the position of said device while moving from a cap-receiving to a cap-applying position.

26. An apparatus of the class described comprising a cap-supplying device, means for supporting a filled can in upright position to receive a cap, a vertically reciprocable device capable of receiving a cap from the cap-supplying device and transferring and applying it to the filled can on said support, and means for automatically inverting the position of said device while moving from a cap-receiving to a cap-applying position.

27. An apparatus of the class described comprising a can support, a cap-supplying chute, and a cap-transferring and applying device reciprocable between the chute and can support, said device carrying jaws capable of opening at one side to receive a cap from the chute, and means for holding said jaws in closed position while said device is moving from a cap-receiving to a cap-applying position.

28. An apparatus of the class described comprising a cap-supplying chute, a can support, a cap-transferring and applying device bodily reciprocable between the chute and can support, means for inverting said device while moving from a cap-receiving to a cap-applying position, and means operative automatically to hold a cap on said device during its inversion.

29. A capping machine comprising an inclined cap-supplying chute, a support for a can or receptacle, a cap-transferring and applying device reciprocable vertically between said chute and can support, means for bodily inverting said device while moving from a cap-receiving to a cap-applying position, and means operative by the cap-transferring and applying device for controlling the supply of caps thereto from said chute.

30. A capping machine comprising an inclined cap-supplying chute, a support for a can or receptacle, and a device capable of transferring a cap from said chute and applying it to a can or receptacle on said support, said device having means for positioning it in alinement with the discharge end

of the chute to receive a cap and for moving it into a position to apply such cap to the can or receptacle on said support.

31. In an apparatus of the class described, the combination of capping mechanism, means for operating the capping mechanism including a one revolution clutch, can feeding mechanism, and means operated from the can feeding mechanism for throwing said clutch into action.

32. In an apparatus of the class described, the combination of cap applying mechanism, driving mechanism for the cap applying mechanism including a one-revolution clutch provided with a pawl, can feeding mechanism, and means operable by the can feeding mechanism for actuating said pawl to cause the operation of the capping mechanism.

33. In an apparatus of the class described, the combination of can capping mechanism, a power operated member, can feeding mechanism, and mechanism thrown in action by the can feeding mechanism for throwing the capping mechanism in working relation with said power operated member to cause the action of said capping mechanism.

34. In an apparatus of the class described, the combination of can capping mechanism, feeding mechanism for the cans, driving mechanism for the can capping mechanism including a clutch, and means operable by the can feeding mechanism to throw said clutch into action to cause the operation of said capping mechanism.

35. In an apparatus of the class described, a cap-carrying and transferring device, means for supporting a can in upright position, the cap-carrying and transferring device and the can support being relatively movable toward and from one another, and means for supplying a cap to said cap-carrying and transferring device when the same is in its cap-receiving position, mechanism for bodily inverting the cap-carrying and transferring device as the latter moves from a cap-receiving to a cap-applying position.

36. In an apparatus of the class described, the combination of an inclined cap-supplying chute, means for supporting a can in upright position, and a cap-carrying and transferring device movable between said chute and said can supporting means and embodying mechanism for bodily inverting its position after it has received a cap from said chute and while it moves into a position to apply such cap to the upright can.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

FREDERICK J. HEYBACH.

Witnesses:

HEATH SUTHERLAND,  
ROBERT EVERETT.