J. BRENZINGER.

BOTTLE CAPPING MACHINE.

APPLICATION FILED MAY 5, 1917.

1,290,706.

Patented Jan. 7, 1919.

7 SHEETS—SHEET 1.

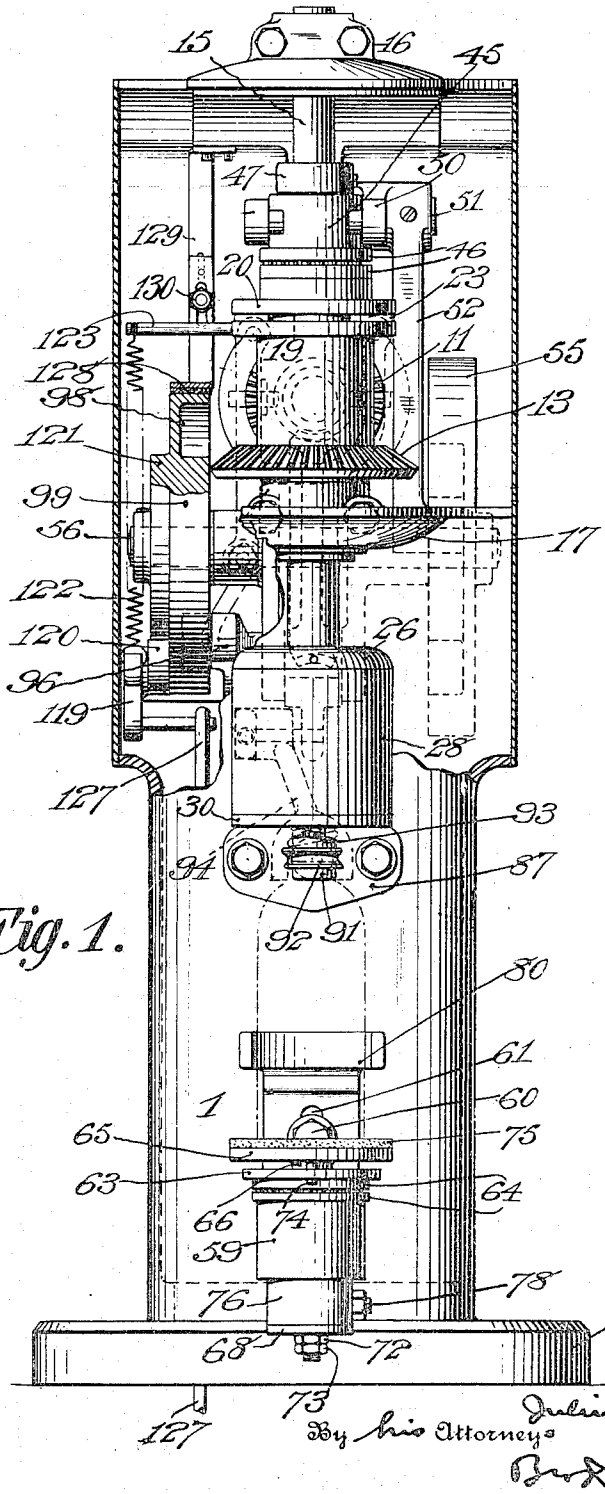


Fig. 1.

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7 SHEETS—SHEET 2.

Fig. 2.

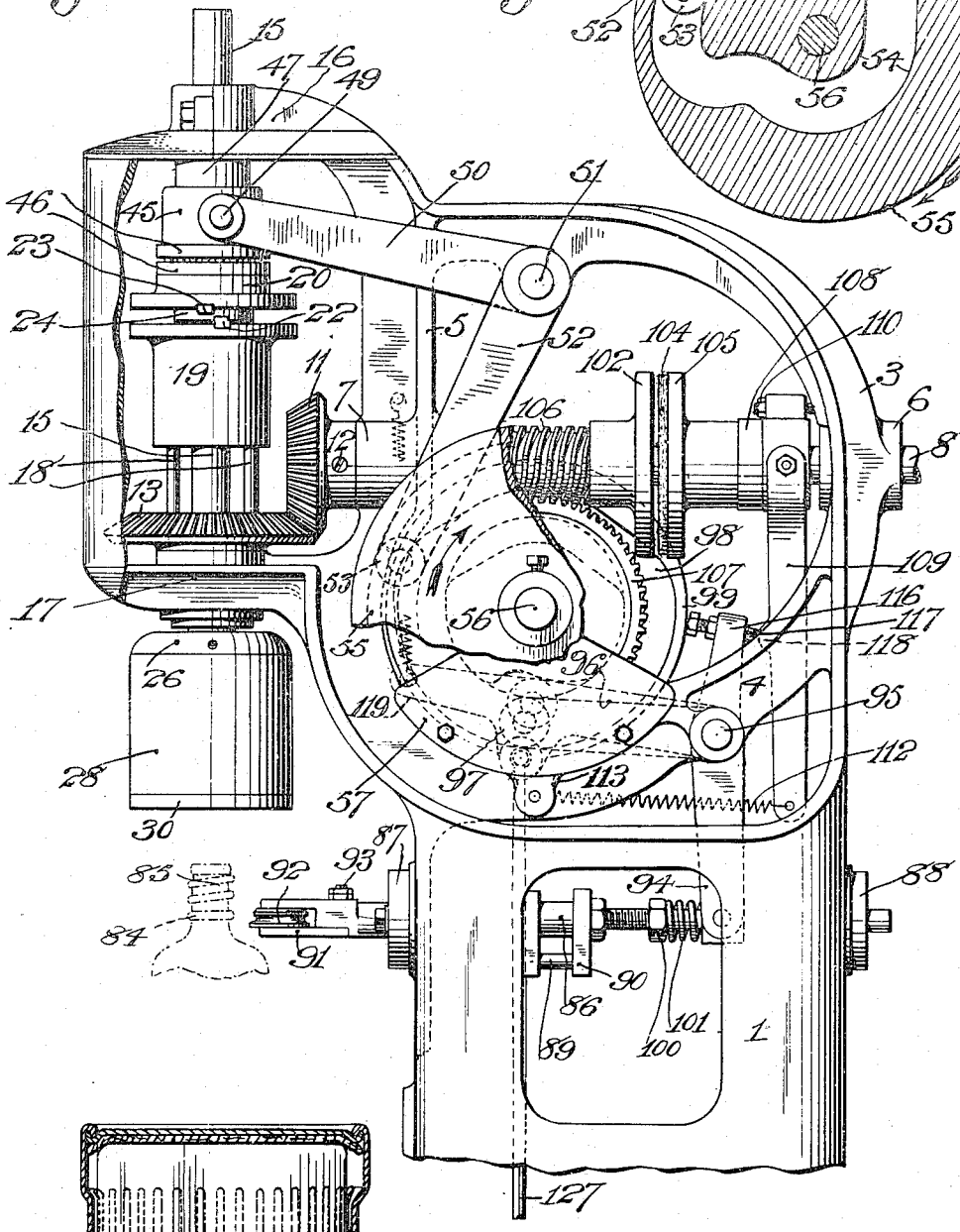


Fig. 15.

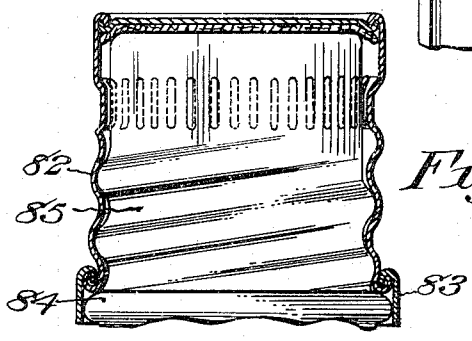


Fig. 14.

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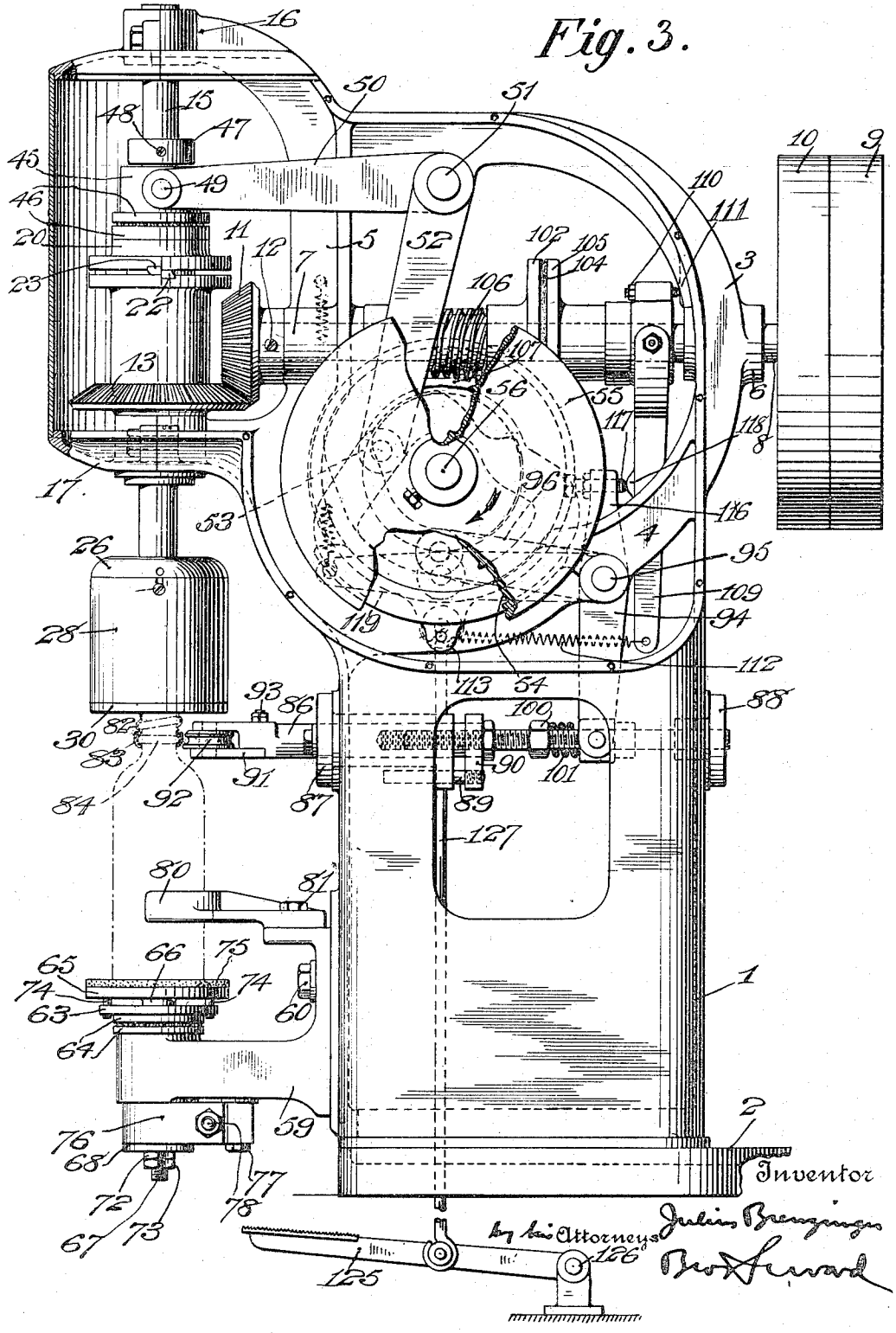
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Fig. 3.



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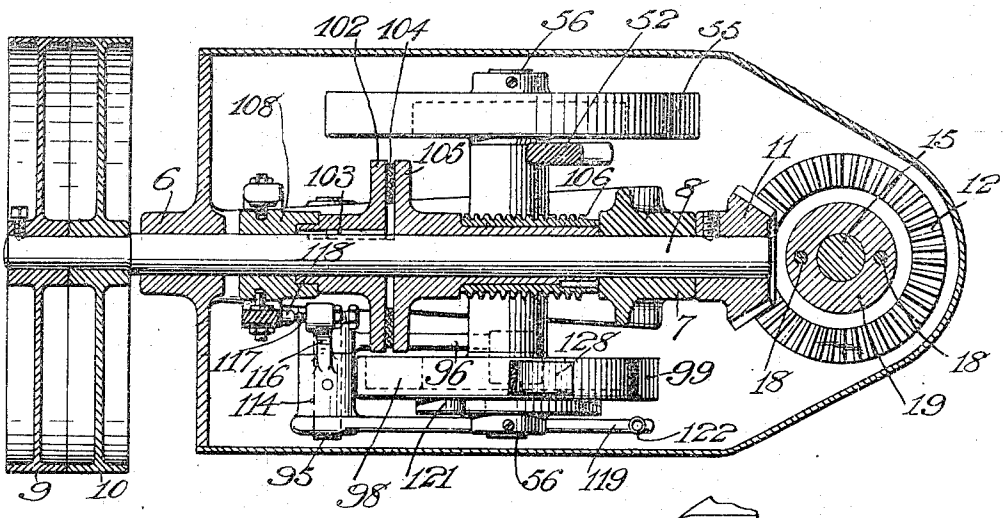
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Fig. 4.



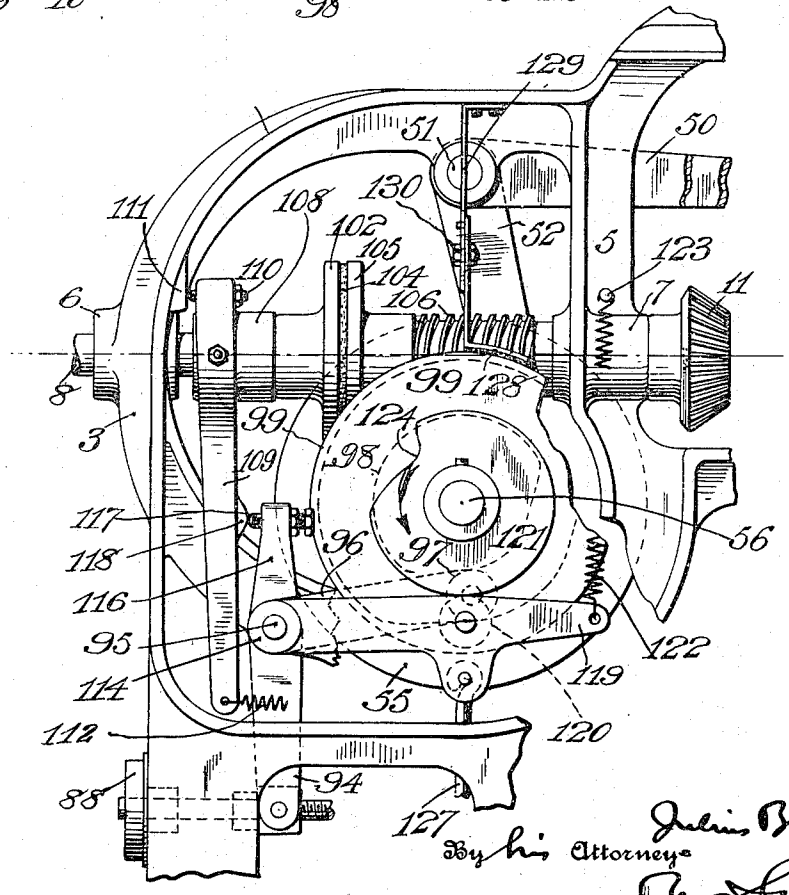


Fig. 5.

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7 SHEETS—SHEET 5.

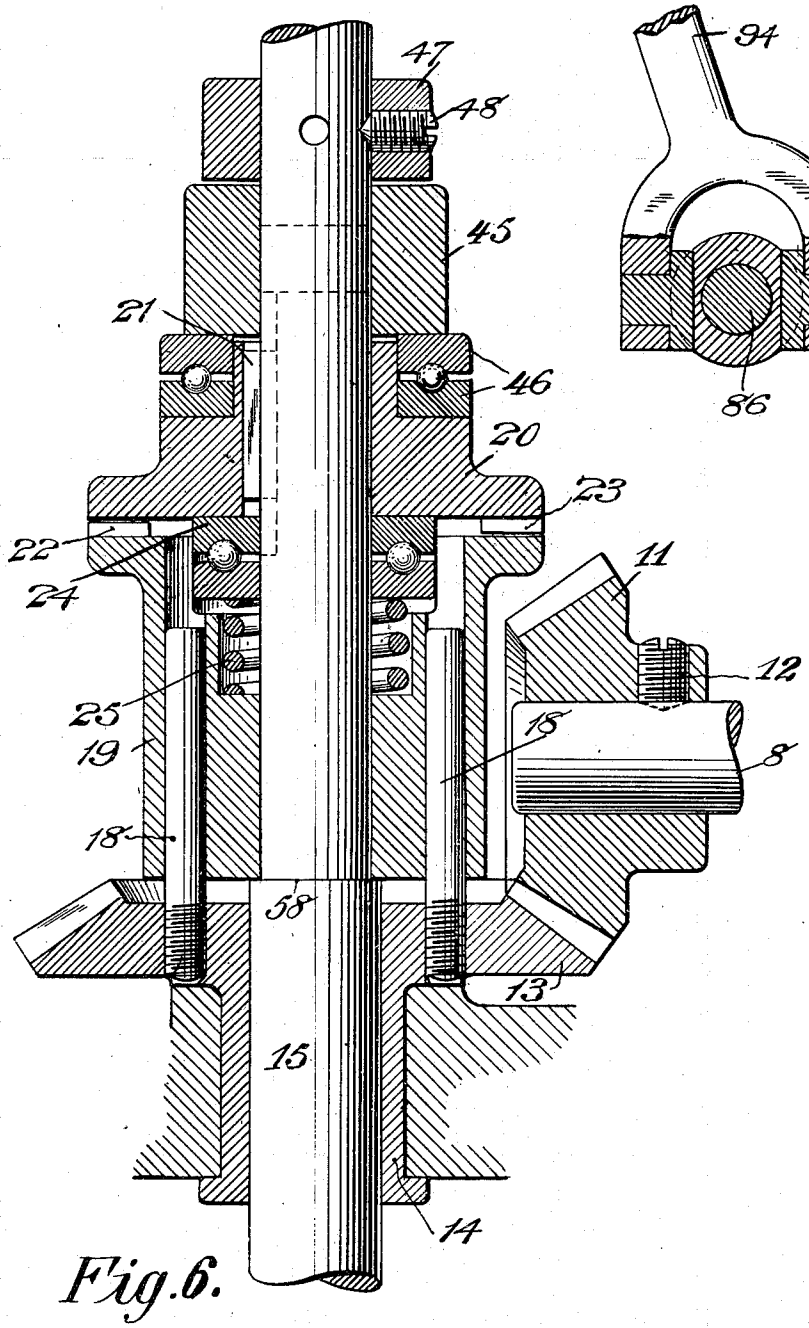


Fig. 6.

Fig. 13.

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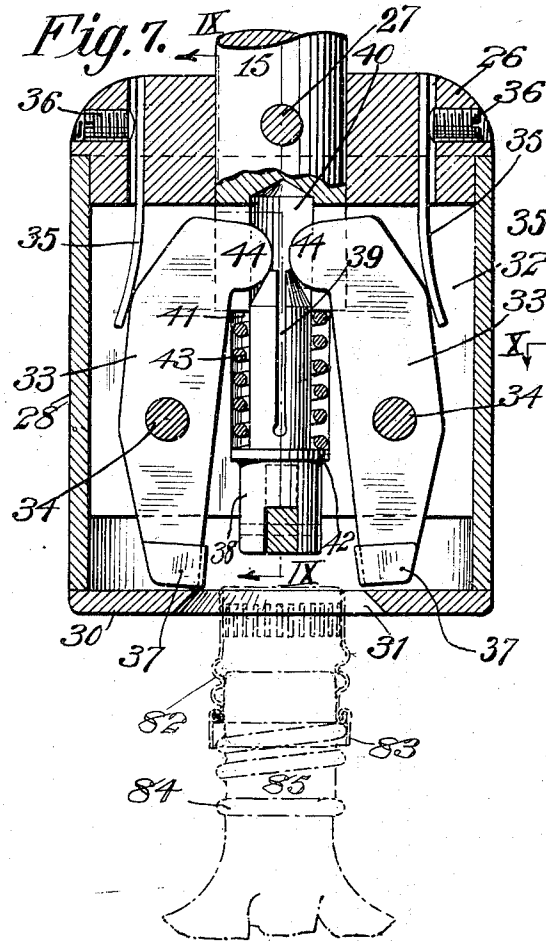
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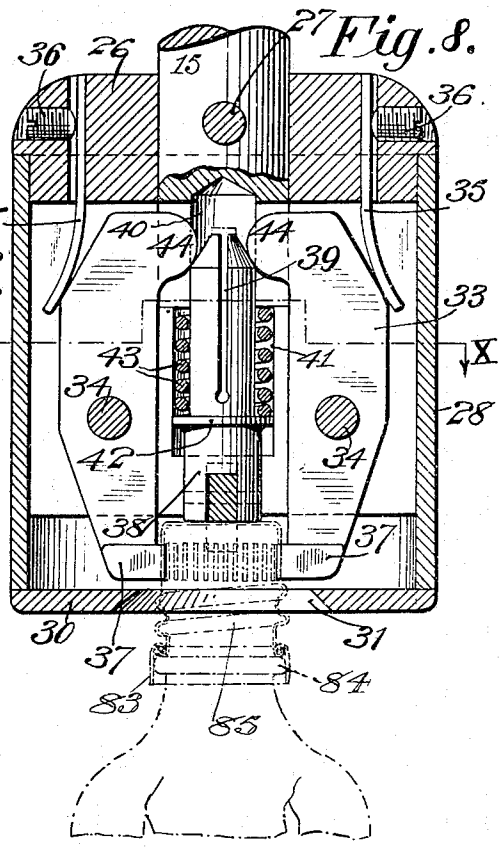
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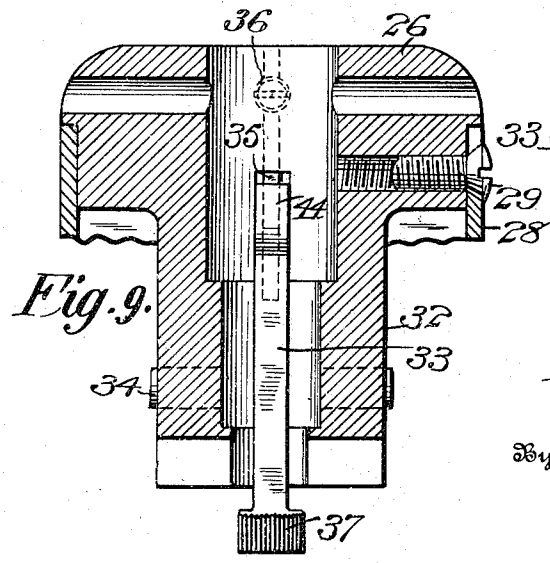
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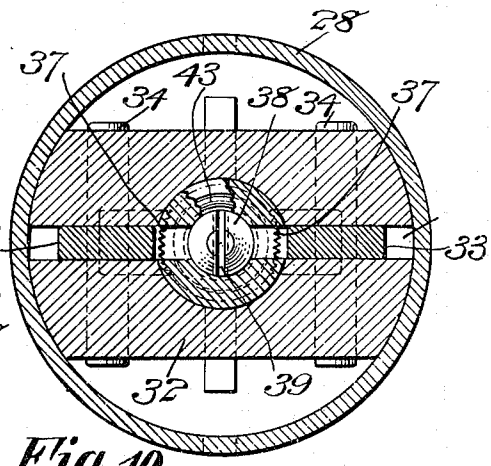
Patented Jan. 7, 1919.

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BOTTLE CAPPING MACHINE.

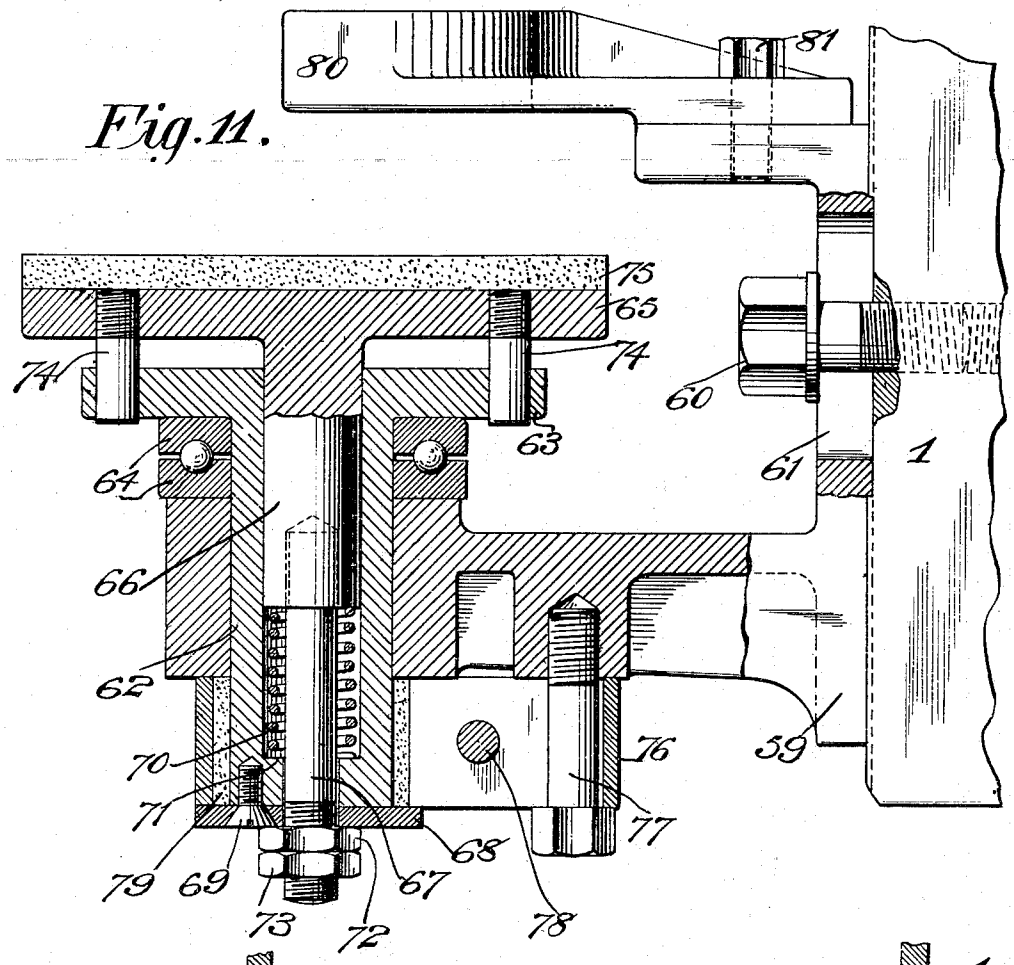
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1,290,706.

Patented Jan. 7, 1919.

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Fig. 11.



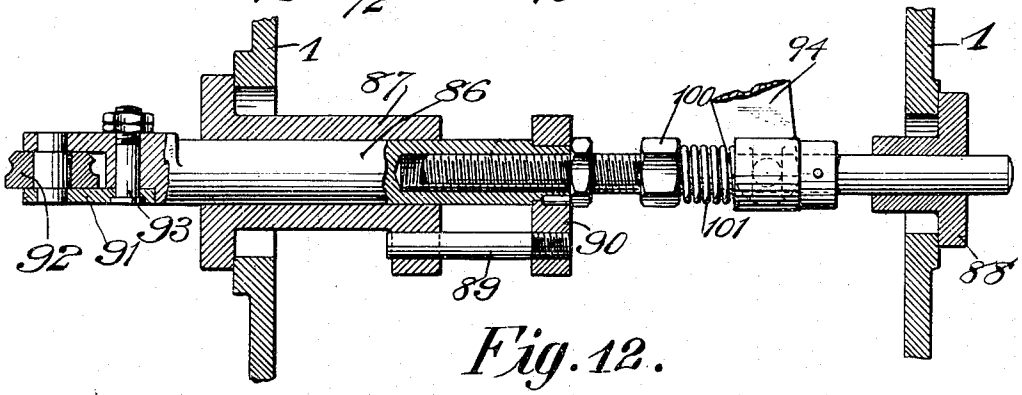


Fig. 12.

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UNITED STATES PATENT OFFICE.

JULIUS BRENZINGER, OF MOUNT VERNON, NEW YORK, ASSIGNOR TO PARAGON METAL CAP COMPANY, INC., OF BROOKLYN, NEW YORK, A CORPORATION OF NEW YORK.

BOTTLE-CAPPING MACHINE.

1,290,706. Specification of Letters Patent. Patented Jan. 7, 1919.

Application filed May 5, 1917. Serial No. 166,599.

To all whom it may concern:

Be it known that I, JULIUS BRENZINGER, a citizen of the United States, and resident of Mount Vernon, in the county of Westchester and State of New York, have invented new and useful Improvements in Bottle-Capping Machines, of which the following is a specification.

This invention relates to a machine for applying closures to receptacles and more particularly to a machine for applying screw caps to bottles.

An object is to provide a machine of this character which is substantially automatic in action, which performs its work with great rapidity, and which applies the caps without injury to them or to the bottles.

Another object is to provide a machine of this character which has means for firmly applying the caps to the bottles with a predetermined pressure and for locking the caps in such position.

A further object consists in providing certain improvements in the form, construction and arrangement of the several parts whereby the above mentioned and other objects may be effectively attained.

A practical embodiment of my invention is represented in the accompanying drawings in which,

Figure 1 represents a front elevation of the machine, a portion of the casing being removed so as to expose the interior mechanism.

Fig. 2 represents a side elevation of the machine with parts of the casing removed, parts of the mechanism being broken away so as to expose other parts; and a portion of a bottle being shown in dotted lines.

Fig. 3 represents a view similar to Fig. 2, with the parts in different positions, a portion of a bottle and cap thereon being shown in dotted lines.

Fig. 4 represents a horizontal section through the machine substantially in the plane of the main drive shaft, looking downwardly.

Fig. 5 represents a detail side elevation of part of the mechanism, the view being taken from the side opposite to that shown in Figs. 2 and 3.

Fig. 6 represents an enlarged detail sectional view of part of the plunger actuating mechanism.

Fig. 7 represents an enlarged detail section showing the clutch mechanism with the jaws in open position, a portion of the bottle and cap being represented in dotted lines.

Fig. 8 represents a view similar to Fig. 7, with the jaws in closed position against the bottle cap.

Fig. 9 represents a vertical detail section taken in the plane of the line IX—IX of Fig. 7, looking in the direction of the arrows.

Fig. 10 represents a horizontal section taken in the plane of the line X—X of Fig. 8, looking in the direction of the arrows.

Fig. 11 represents an enlarged detail view, partly in side elevation and partly in section, showing the bottle supporting mechanism.

Fig. 12 represents an enlarged detail view, partly in section and partly in side elevation, showing the means for locking the cap to the bottle.

Fig. 13 represents an enlarged detail view, partly in section and partly in elevation, of the means which operates the mechanism shown in Fig. 12.

Fig. 14 represents an enlarged detail view, partly in section and partly in side elevation, showing the bottle neck and cap thereon, in position to be operated upon by the locking mechanism, and

Fig. 15 represents a detail transverse section showing the contour of one of the cams for actuating certain of the mechanism.

The machine comprises a casing, denoted by 1, which may be composed of appropriate material such as cast iron, and which is fitted to be mounted on a suitable table or support 2 for convenient operation.

The upper part of the casing is developed into an open framework which consists of an upwardly curving portion 3, a downwardly curving portion 4, and a vertical portion 5. This framework 3, 4, 5 has oppositely disposed journals 6, 7, which are adapted to rotatably support the main power drive shaft 8. The outer end of the said shaft is provided with the usual fixed and loose pulleys 9, 10, in order to adapt the machine for a belt drive from any suitable source of power.

The opposite end of the shaft 8 has a bevel pinion 11 fixedly secured thereto by a set screw 12, which pinion is in constant mesh with a bevel gear 13 that is integral with a sleeve 14 (see Fig. 6), rotatably and slidably mounted upon the plunger shaft 15. The plunger shaft is vertically journaled in upper and lower brackets 16, 17,

which project laterally from the upright part 5 of the open framework 3, 4, 5.

A pair of guide pins 18 are threaded into the gear 13 and stand upwardly therefrom for sliding engagement with suitable openings fashioned in a lower clutch member 19 which is slidably and rotatably mounted upon the shaft 15. Thus the clutch member 19 is fixed to rotate with the gear 13, but is free to have a vertical sliding movement independently of the said gear.

An upper clutch member 20, which is adapted to mate with the clutch member 19, is fixed against rotation on the shaft 15, by means of a spline 21, which latter, however, does not prevent the clutch member 20 from enjoying a limited sliding movement with respect to the said shaft. The opposite contact faces of the clutch members 19, 20, have suitable lugs 22, 23, thereon for engagement when the clutch is in operative position. The two parts of the clutch are normally held out of mutual engagement by means of a ball bearing 24 seated in the upper part of the clutch member 19, and normally urged upwardly against the under face of the member 20 by an expansion spring 25 housed in the member 19 beneath the said bearing.

As a result of the arrangement just described, it will be noted that the gear 13 and the clutch member 19 are constantly rotating under the impulse of the pinion 11, while the upper clutch member 20 is normally at rest.

The plunger shaft 15 carries at its lower extremity the gripping mechanism for seizing the cap and screwing it on the bottle. Attention is directed to Figs. 7 to 10 inclusive. This gripping mechanism consists of a head piece 26 which is fixed to the shaft 15, by a pin 27. A cylindrical shell 28 is secured to the head piece 26 by a screw 29, to the bottom of which shell is fastened (as by brazing) a plate 30 which has a centrally disposed orifice 31.

The head piece 26 is projected downwardly in the form of a bifurcated block 32. A pair of grippers 33 are vertically arranged in the slot between the bifurcations of the block 32 (see Fig. 10), and are pivoted therein by means of horizontal pins 34. The upper extensions of the grippers 33 are yieldingly forced toward each other by means of leaf springs 35 which are fixed in the head piece 26 by means of set screws 36; which action normally holds the serrated jaws 37 of the grippers apart in inoperative position.

The block 32 also houses a plunger 38 which is centrally disposed therein and has an upward extension which is slotted, as shown at 39. This upward extension of the plunger 38 is calculated to traverse a central bore in the block 32, which bore has an upper reduced portion 40 and a lower enlarged portion 41. The plunger 38 also has an annular flange 42 which seats against a shoulder at the bottom of the enlarged portion 41 of the said bore, and an expansion spring 43 is arranged in the said enlarged portion 41, surrounding the upward extension of the plunger 38, which spring bears against the flange 42 and the upper end of the said portion 41 of the bore, so as to yieldingly hold the plunger 38 at the limit of its downward movement.

The upper extremity of the plunger 38 is adapted, as clearly shown in Figs. 7 and 8, for engagement with noses 44 on the upper inner part of the grippers 33, whereby any rising movement of the plunger 38 in the block 32 will force the upper ends of the grippers apart so as to bring the jaws 37 toward each other and into gripping engagement with the bottle cap, (see Fig. 8).

Means for actuating the plunger shaft 15 and parts carried thereby will now be described. Attention is directed to Figs. 2, 3 and 6. A collar 45 is slidably mounted upon the shaft 15 above the clutch member 20; and a ball bearing 46 serves to provide an antifriction spacing medium between the collar 45 and clutch member 20; while a stop 47, which is fixed to the shaft 15 by a set screw 48, positively limits the upward movement of the collar 45 which is normally urged upwardly by the clutch member 20 since the latter is under the influence of the spring 25, as has been hereinbefore suggested.

The collar 45 has a pair of laterally projecting trunnions 49 which engage a yoke at the end of one arm 50 of a bell crank lever which is pivoted at 51 in the upper part 3 of the framework 3, 4, 5. The lower arm of the bell crank lever is denoted by 52, and projects downwardly. It has at its lower end a roller 53 which is fitted to travel in a cam groove 54, (shown in dotted lines in Figs. 2 and 3 and in full lines in Fig. 15), fashioned in a cam wheel 55. The cam wheel 55 is fixed to rotate upon a shaft 56 which is journaled in a pair of brackets 57 that are secured to the lower part 4 of the framework 3, 4, 5. The means for imparting rotary movement to the shaft 56 will be hereinafter described.

The shape of the cam groove 54 is such that when the plunger shaft 15 is in the raised position shown in Figs. 2 and 7, the lower arm 52 of the bell crank lever will be first drawn rearwardly, then held in its rear position for a period and finally returned to its forward position; and, as will be perfectly clear, the said movements of the arm 52 will cause the outer end of the arm 50 of the bell crank lever to be depressed, held depressed for a period, and then returned to its raised position. The downward move-

ment of the arm 50 forces downwardly the collar 45 which engages, through the medium of the bearing 46, the upper clutch member 20 (see Fig. 6), thus imparting a downward movement to it. The latter, in turn, through the spring 25, tends to depress the lower clutch member 19, which, by reason of its contact with the shoulder 58 on the shaft 15, forces the said shaft and gripping mechanism carried thereby downwardly. During this initial movement, the spring 25 holds the clutch members 19, 20, out of interlocking engagement. Thus, the said gripping mechanism will be depressed until the plunger 38 engages the cap on the bottle; after which, continued downward movement will at first force the cap, with a certain degree of firmness, against the threads on the bottle, thus bringing to a stop the downward movement of the plunger 38. However, the downward movement of the other parts carried by the shaft 15 continues, and thus the plunger 38 is forced upwardly in the block 32. This movement will cause the taper on the upper end of the plunger 38 to press apart the upper ends of the grippers 33, thus forcing their jaws 37 toward each other and into engagement with the bottle cap, as shown in Fig. 8.

By this time the pressure of the plunger 38 against the bottle cap is so strong that the resistance of the spring 25 is overcome sufficiently to allow the clutch members 19 and 20 to approach each other and bring their lugs 22 and 23 into interlocking engagement. As a result of this engagement the clutch member 20 will be rotated with the constantly rotating member 19, and the former will in turn impart rotation to the shaft 15 which carries the grippers 33. Thus, the cap will be screwed upon the bottle while the shaft 15 is still forced downwardly by the action of the cam groove 54 on the arm 50, as hereinabove described. After the cap has been screwed home, the second segment of the cam groove 54 serves to hold the plunger shaft 15 depressed for a period while the mechanism for locking the cap is operating, as will be hereinafter described. When this step has been completed, the third segment of the cam groove 54 causes a reverse action of the bell crank 50, 52, thereby raising the shaft 15 and reversing all the actions described in connection with the downward travel of the said shaft.

I will now proceed to describe the means for supporting the bottle in position to have the cap applied thereto. Attention is directed to Figs. 3 and 11.

A bracket 59 is secured to the side of the casing 1, below the plunger shaft 15, by means of a bolt 60 which traverses a slot 61 for permitting vertical adjustment of the bracket 59. The outer end of the bracket 59 has a vertical bore which is adapted to rotatably receive a sleeve 62 that has a laterally projecting annular flange 63 at its outer end. This flange rests upon a ball bearing 64 which is seated on the upper part of the bracket 59, and thereby limits the downward movement of the sleeve therein.

The table or support for the bottle is denoted by 65, and has a downwardly extending spindle 66, in the lower part of which is threaded a bolt 67 which passes through the lower end of the sleeve 62 and a plate 68 which is secured to the latter by a screw 69. An expansion spring 70 is housed within the sleeve 62 around the bolt 67, and abuts the lower end of the spindle 66 and a shoulder 71 at the bottom of the said sleeve. Thus, the spring 70 normally urges the spindle 66, and table 65 carried thereby, upwardly in the sleeve 62. The limit of this upward movement is determined by means of an adjusting nut 72 which is threaded upon the lower end of the bolt 67 and engages the plate 68. A suitable lock nut 73 may be provided if desired. While the table 65 and sleeve 62 enjoy relative vertical movement with respect to each other, they are fixed against relative rotary movement by means of pins 74 which are threaded into the table 65 and engage apertures in the flange 63 of the sleeve 62, as clearly shown in Fig. 11. The upper face of the table 65 may have a suitable pad 75, composed of felt or other desired material.

Means is provided for retarding the rotation of the sleeve 62 in the bracket 59, which consists of a brake band 76, one end of which is anchored to the bracket 59 by a cap screw 77, while the remainder surrounds the lower part of the sleeve 62 and is adjustably fastened upon itself by a bolt 78. Suitable friction material, such as a ring of leather 79, is interposed between the sleeve 62 and the brake band 76. It will be obvious that, by adjusting the bolt 78, the degree of pressure with which the brake band 76 grips the sleeve 62 may be varied at will.

The bottle supporting means also includes a clamp or rest 80 which is secured to the bracket 59 by a cap screw 81, and projects over the table 65. The outer end of the rest 80 may be of such configuration as to conform to the contour of the bottle. In the present instance, it is indicated as half-round, so as to nicely fit a circular bottle. It will be understood that the location of the support 65 and rest 80 is such that when a bottle is set upon the former and pushed into contact with the latter, it will be in axial alinement with the plunger shaft 15, which carries the mechanism for screwing the cap on to the bottle as hereinbefore described. Thus, I have provided a vertically yielding rotatable support for the bottle with means for retarding or breaking the permitted rotary movement.

It will be noted that the bottle cap (see Fig. 14), that is indicated by 82, has a depending apron 83, which is designed to be crimped or spun about the beading 84 upon the neck of the bottle 85. The machine includes mechanism for performing this step, which will now be described, attention being directed to Figs. 2, 3 and 12.

A rod 86 is mounted for reciprocation in bearings 87, 88, in the casing 1, below the part 4 of the open framework 3, 4, 5, as will be clearly seen by an examination of Fig. 12. This rod 86 is composed of two parts, one threaded into the other, so as to provide adjustability as to its length. A pin 89 is screwed into a lug 90 which is keyed to the rod 86, the free end of which pin enters a hole in the bearing 87 so as to guide the rod 86 in its reciprocatory movement and prevent it from turning.

The outer or forward end of the rod 86 is bifurcated, and one of the bifurcations 91 is removed so as to permit the insertion of a spinning roller 92. The bifurcation 91 and roller 92 may be firmly clamped to the rod 86 by means of a bolt 93.

The mechanism for actuating the rod 86 consists of a bell crank lever, the depending arm 94 of which has a yoke and pin engagement (see Fig. 13) with the rod 86. The said bell crank is fulcrumed on a pivot 95 mounted in the part 4 of the open framework 3, 4, 5, and its other arm 96 carries a roller 97, which travels in a cam groove 98 fashioned in the cam wheel 99 fixed to rotate with the shaft 56. The contour of the cam groove 98 is such that when the cam wheel 99 is rotated, the bell crank 94, 96, will at first advance the rod 86, hold it in its advanced position for a short period, and then retract it. This occurs during one revolution of the cam wheel 99. It will be noted that an arrangement is provided for causing the forwardly moving action of the bell crank upon the rod 86 to be a yielding or cushioned one, which arrangement comprises a nut 100 threaded upon the rod 86, and a spring 101 which is interposed between the nut 100 and the depending arm 94 of the bell crank.

Thus, in operation, the rod 86 is urged forwardly until the spinning roller 92 engages the apron 83, in which position the parts are yieldingly held while the roller spins down the apron about the beading 84 on the bottle. This spinning action is effected by the rotation of the bottle as will be hereinafter described. When the spinning or crimping of the apron 83 has been completed, the rod 86 is withdrawn as already indicated.

The shaft 56 which carries the cam wheels 55 and 99, is, as above stated, mounted for rotation, and the means for imparting this movement to the shaft 56 will now be described, reference being had to Figs. 2, 3, 4 and 5.

The power shaft 8 (see Fig. 4) has a clutch member 102 fixed to rotate with it by means of a key 103. This clutch member has a friction device, such as a leather disk 104, secured to its face, for engagement with a clutch member 105 which is rotatably mounted upon the power shaft 8. This clutch member 105 has a worm 106 fixed thereto, which worm engages a worm wheel 107, (see Fig. 2), fast upon the shaft 56.

The means for actuating the clutch just described consists of a sleeve 108 which is slidably and rotatably mounted on the power shaft 8, and adapted for abutting engagement with the clutch member 102. This sleeve 108 engages, by a pin and yoke engagement (see Figs. 4 and 5), a depending lever 109. The uppermost part of the lever 109 has a contact pin 110 projecting laterally therefrom for engagement with an abutment 111 upon the inner part of the portion 3 of the open framework 3, 4, 5; while the lower end of the lever 109 is connected to a retractile coil spring 112, which is secured to a lug 113 (see Figs. 2 and 3) formed on the lower part 4 of the framework 3, 4, 5. Thus, the lower part of the lever 109 is normally urged inwardly so as to tend to force the sleeve 108 against the clutch member 102, and bring the latter into engagement with the other clutch member 105.

This normal action of the lever 109 is controlled by a bell crank (see Figs. 4 and 5), which has a hub 114 mounted on the pivot 95, heretofore mentioned, that projects laterally from the lower part 4 of the open framework. One arm of the bell crank, denoted by 116, projects upwardly and carries a contact screw 117 which is adapted for engagement with a nose 118 formed upon the lever 109. The other arm of the bell crank, which is laterally extending, is indicated by 119, and is provided with a roller 120 adapted for engagement with a cam 121 fixed upon the shaft 56 adjacent the cam wheel 99. A retractile coil spring 122, which is anchored to a stud 123 on the part 5 of the open framework, engages the free end of the arm 119 and yieldingly draws it upward so as to maintain the roller 120 continuously in contact with the cam 121.

The cam 121 is circular in the main, but has a dwell 124, as clearly shown in Fig. 5. When the roller 120 is resting in the dwell 124, it will be understood that the arm 119 is at the limit of its upward movement, and hence the arm 116 has forced the lever 109 to the rear so as to draw the sleeve 108 out of engagement with the clutch member 102, thereby disengaging the latter from the clutch member 105 so as to disconnect and incapacitate the drive for the shaft 56. When, on the contrary, the roller 120 is riding upon the circular portion of the cam

121, the parts just named are in the reverse position, so as to engage the clutch 102, 105, thereby driving the worm 106 and hence the shaft 56.

It is this position of the roller 120 with respect to the cam 121, therefore, that determines the operation of the machine; for, as already described, it is the cam wheels 55 and 99 which primarily determine the operation of the plunger shaft 15 and mechanism carried thereby for screwing the cap onto the bottle, as well as the rod 86 and mechanism carried by it for locking the cap onto the bottle by spinning down the apron.

The action of the arm 119, which carries the roller 120, is designed to be under the control of the operator and, to this end, a treadle 125 (see Fig. 3) is pivoted at 126, to the floor, which treadle is connected to the arm 119 by a rod 127.

While it is thought that the operation of the machine will be apparent to one skilled in the art, from the foregoing description, it may be briefly set forth as follows.

The bottle, with the cap resting thereon, is placed upon the table 65 and in engagement with the rest 80. At this time the roller 120 on the bell crank arm 119 is resting in the dwell 124 fashioned in the cam 121. The operator now depresses the treadle 125 thus drawing downwardly the arm 119. This procedure causes the clutch members 102, 105, to be engaged, in the manner just described. The engagement of the said clutch mechanism serves to rotate the worm 106 which is in engagement with the wheel 107, thereby imparting rotary movement, in the direction indicated by the arrows on Figs. 3 and 5, to the shaft 56 and cam arrangements carried thereby. As soon as this movement of the shaft 56 has moved the dwell 124 in the cam 121 out of register with the roller 120, the operator permits the treadle to rise so that the said roller rests upon the circular periphery of the cam 121, in which position the shaft 56 is still under the influence of the mechanism imparting rotary movement thereto.

The movement of the said shaft 56 will now actuate the bell crank 50, 52, so as to depress the plunger shaft 15, and cause it to force the cap firmly against the threads on the bottle, its gripping mechanism to grip the cap, and finally, the said mechanism to be rotated so as to screw the cap home upon the bottle; all as hereinbefore described.

When the cap has been screwed home, the continued rotary movement of the gripping mechanism serves to rotate the bottle and the support which carries it. At this juncture the bell crank lever 94, 96, is operated by the cam wheel 99 so as to thrust the rod 86 forwardly and bring the spinning roller 92 into engagement with the apron 83 on the bottle cap, in order to spin the apron down about the beading 84, which spinning is effected by the continued rotation of the bottle.

The mechanism is so timed that these operations all occur during one rotation of the shaft 56 and while the roller 120 on the arm 119 is riding upon the circular periphery of the cam 121; and, when the roller 120 again snaps into the dwell 124 in the said cam, the operation of pressing and screwing the cap upon the bottle, as well as the spinning down of the apron thereon, has been completed.

It will be understood that this entry of the roller 120 into the dwell 124 serves to disengage the clutch 102, 105, and throw out of operation the mechanism for rotating the shaft 56, thus stopping the machine in so far as the performance of its functions are concerned. It is intended that the dwell 124 in the cam 121 shall be of such form as to prevent the momentum of the parts of the machine from carrying the roller 120 behind it and out on to the circular periphery of the cam 121; which occurrence, if it were not prevented, would again actuate the operating parts of the machine. However, in order to insure the prevention of such an incident, I provide a brake 128 (see Fig. 5) which is curved to conform to the periphery of the cam wheel 99, and has a suitable antifriction face, such as a strip of leather, for engagement with the said cam wheel. The brake 128 is carried by a bracket 129 which is secured to the upper part 3 of the open framework. The said bracket 129 is divided, and its two parts have a pin and slot engagement with each other in order to provide take-up for wear. A bolt and nut, indicated at 130, may be provided for securing the parts in suitable adjustment.

From the foregoing it will be understood that I provide a machine for performing the designated functions, which is substantially automatic in its operation, as it is only necessary for the operator to depress the treadle 125 each time a bottle and cap are placed in position in the machine. Furthermore, the degree of tightness with which the cap is to be screwed home upon the bottle may be predetermined by adjusting the brake band 76 which serves to resist the turning of the table 65 that supports the bottle. Again, the degree of pressure with which the clutch members 102, 105, engage each other, may be varied by adjusting the contact screw 110 at the top of the lever 109; thereby regulating the force with which the mechanism for applying the cap is actuated.

In case the kind of caps desired to be used

are plain screw caps without any aprons, the parts which actuate the rod 86 may be easily disengaged.

I desire it to be understood that various changes may be resorted to in the form, construction and arrangement of the several parts without departing from the spirit and scope of my invention, and hence I do not intend to be limited to the details herein shown and described except as they may be specifically including in the claims.

What I claim is:

1. A machine of the class described, comprising means for pressing the cap upon the receptacle, means for actuating said pressing means including mechanism provided with a clutch adapted to slip when the exertion of power by the said pressing means has reached a predetermined point, means for screwing the cap home, positively driven mechanism for actuating said screwing means, and mechanism for timing the operation of the said several means.

2. A machine of the class described, comprising means for pressing the cap upon the receptacle, means for actuating said pressing means including mechanism provided with a clutch adapted to slip when the exertion of power by the said pressing means has reach a predetermined point, means for screwing the cap home, positively driven mechanism for actuating said screwing means, both said pressing and screwing means being arranged to operate simultaneously, and mechanism for timing the operation of the said several means.

3. A machine of the class described, comprising a rotatable support for the receptacle, means for screwing the cap home upon the receptacle, and means for retarding the rotary movement of the support.

4. A machine of the class described, comprising a yielding, rotatable support for the receptacle, means for pressing the cap upon the receptacle, means for screwing the cap home, and means for retarding the rotary movement of the support.

5. A machine of the class described, comprising a yielding, rotatable support for the receptacle, yielding means for pressing the cap upon the receptacle, means for screwing the cap home, and means for retarding the rotary movement of the support.

6. A machine of the class described, comprising a yielding, rotatable support for the receptacle, yieldingly driven means for pressing the cap upon the receptacle, positively driven means for screwing the cap home, and means for retarding the rotary movement of the support.

7. A machine of the class described, comprising means for screwing an aproned cap upon the receptacle, and spinning means for bending the apron about a beading on the receptacle.

8. A machine of the class described, comprising means for screwing an aproned cap upon the receptacle, spinning means for bending the apron about a beading on the receptacle, and mechanism for timing the operation of the said several means.

9. A machine of the class described, comprising a power shaft, a cam yieldingly driven by said power shaft, means actuated by said cam for pressing the cap upon the receptacle, and means positively driven from said shaft for screwing the cap home.

10. A machine of the class described, comprising a power shaft, a pair of cams yieldingly driven by said power shaft, means actuated by one of said cams for pressing the cap upon the receptacle, means positively driven from said shaft for screwing the cap home, and means actuated by the other of said cams for bending a portion of said cap into locking engagement with the receptacle.

11. A machine of the class described, comprising a power shaft, a pair of cams yieldingly driven by said power shaft, means actuated by one of said cams for pressing the cap upon the receptacle, means positively driven from said shaft for screwing the cap home, a plunger provided with spinning mechanism, means actuated by the other of said cams for bringing said spinning mechanism into contact with a portion of said cap, and means for causing relative rotary movement between the receptacle and the spinning mechanism for bending said portion of the cap into locking engagement with the receptacle.

12. In a machine of the class described, means for pressing the cap upon the receptacle and for screwing the cap home, said means including a plunger having side walls yieldingly inwardly toward its axis, said plunger being adapted to be forced into engagement with the top of the cap and having a tapered upper end, a head having a plurality of jaws pivoted therein, said jaws having inwardly projecting noses at their upper ends and the said upper ends being normally spring-pressed toward the plunger, means for causing relative longitudinal movement between the plunger on the one hand and the jaws on the other to bring the tapered end of the plunger into contact with the noses on the jaws for causing the jaws to grip the cap, and means for rotating the head.

In testimony that I claim the foregoing as my invention, I have signed my name this 3rd day of May, 1917.

JULIUS BRENZINGER.