

1,134,031.

6 SHEETS—SHEET 1.



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BOTTLE CAP ASSEMBLING MACHINE.
APPLICATION FILED AUG. 20, 1913.

1,134,031.

Patented Mar. 30, 1915.

6 SHEETS—SHEET 2.

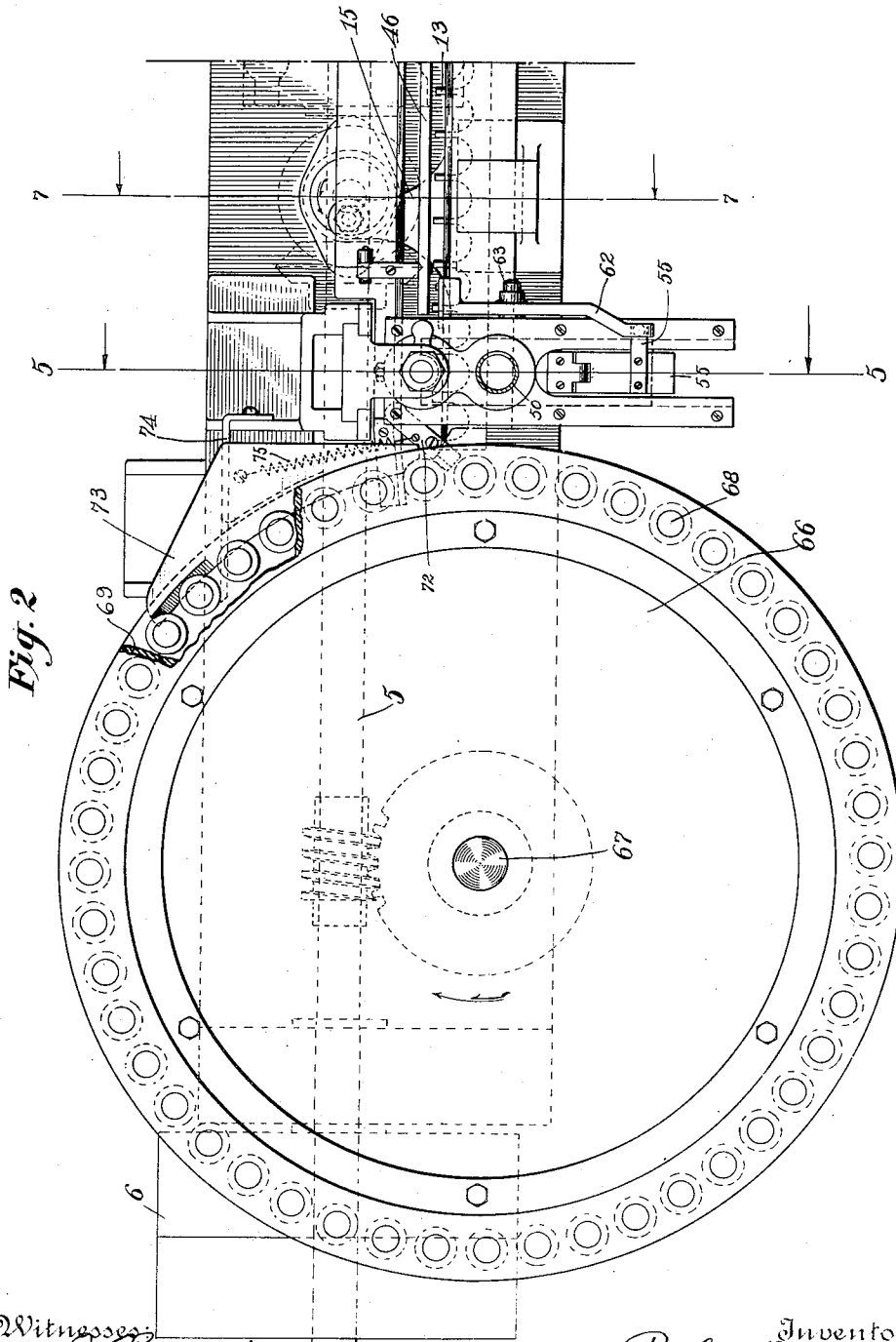


Fig. 2

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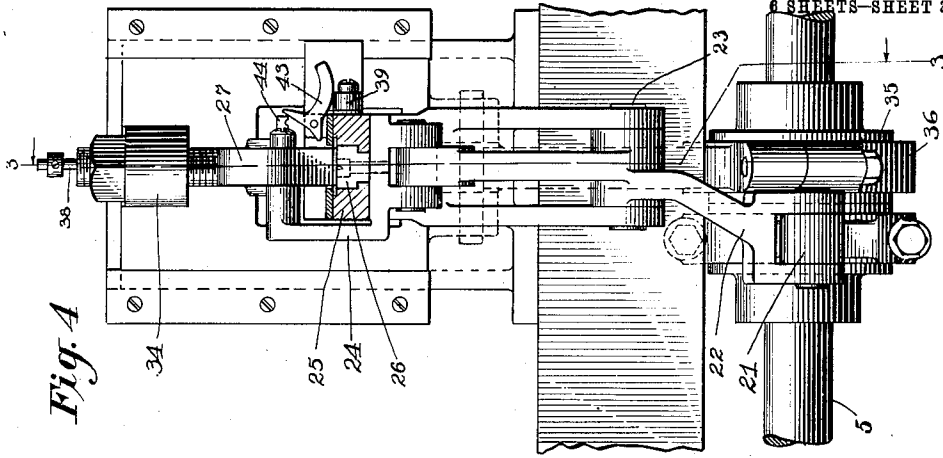


Fig. 4

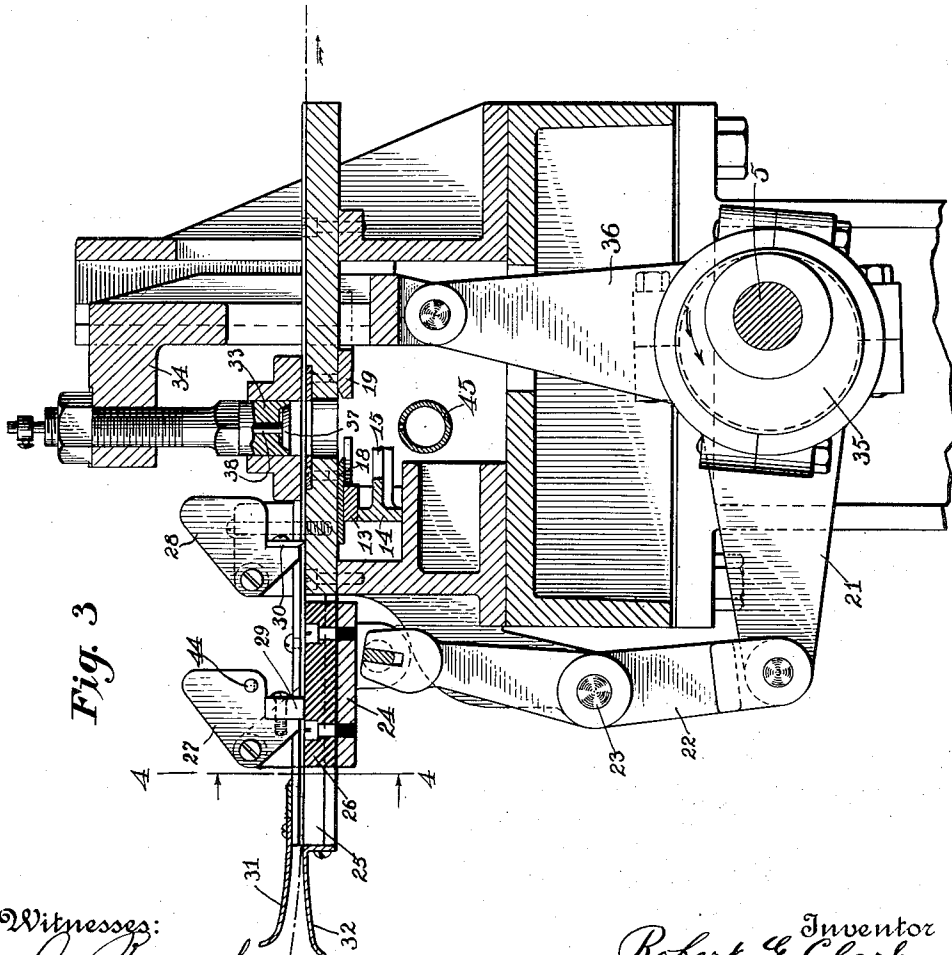


Fig. 3

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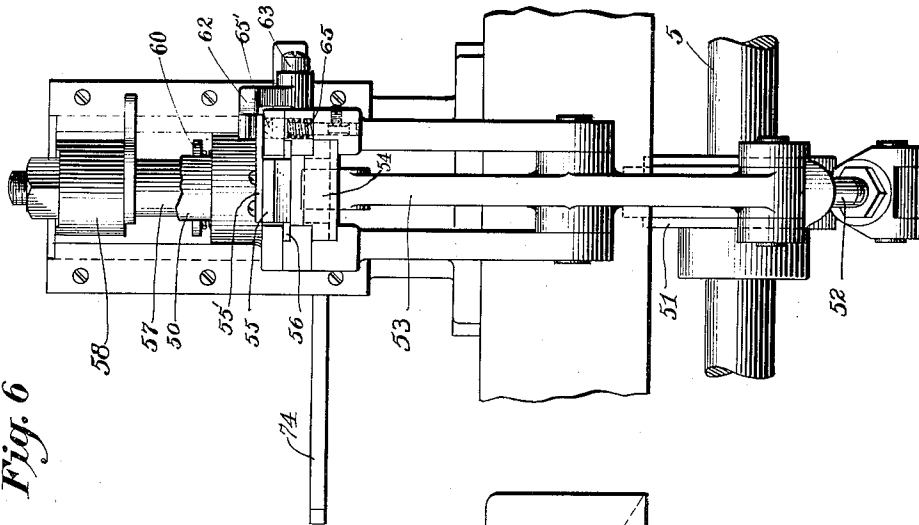


Fig. 6

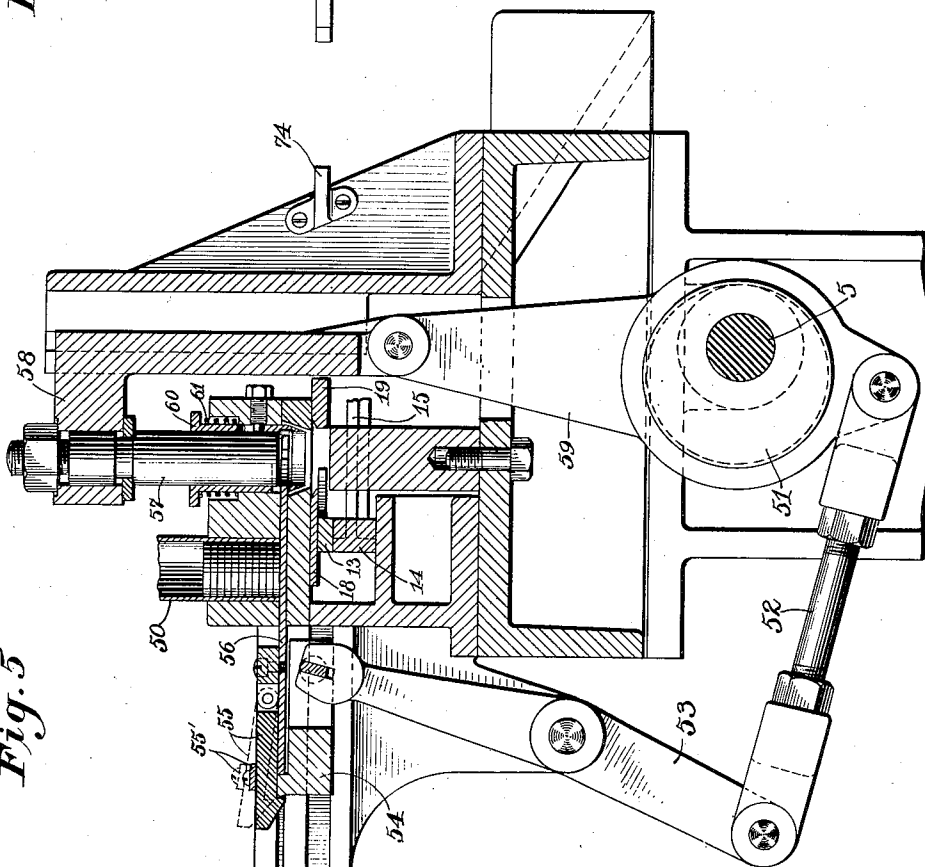


Fig. 5

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6 SHEETS—SHEET 5.

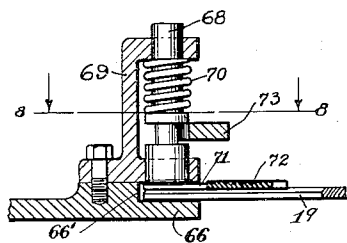


Fig. 9

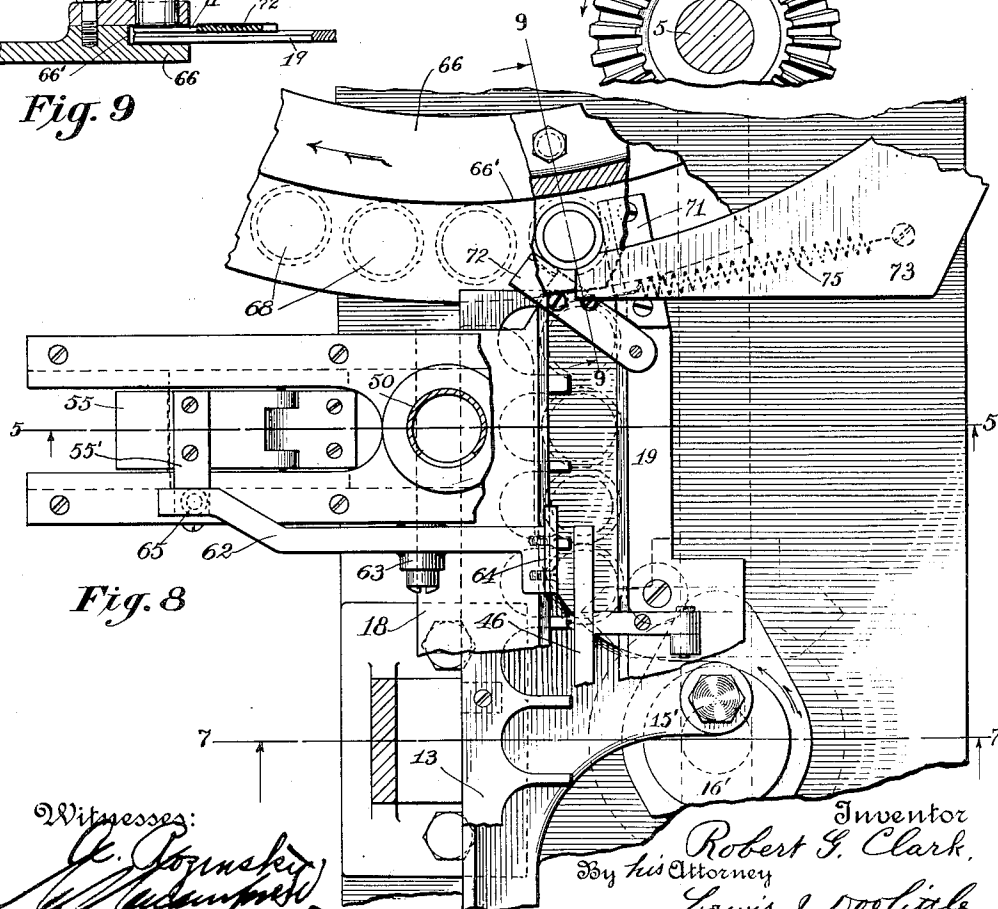


Fig. 8

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6 SHEETS-SHEET 6.

Fig. 10

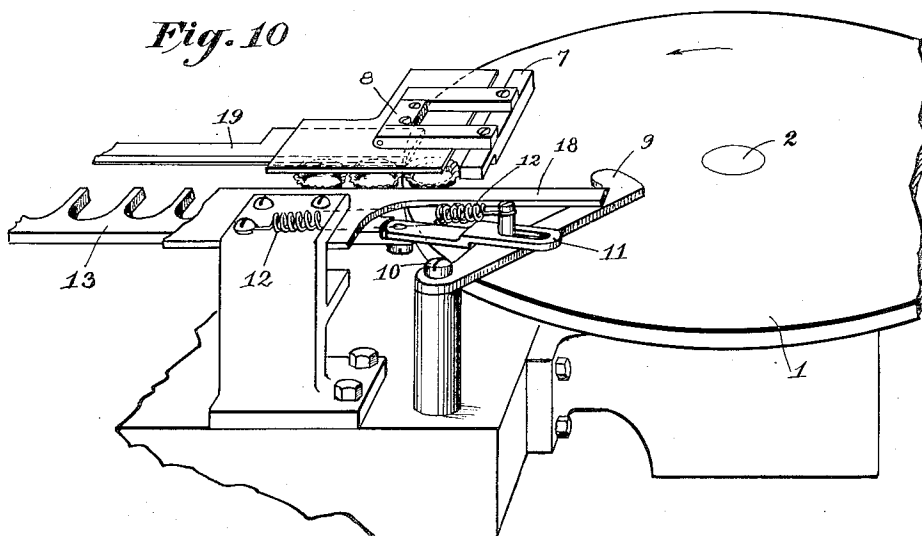


Fig. 11

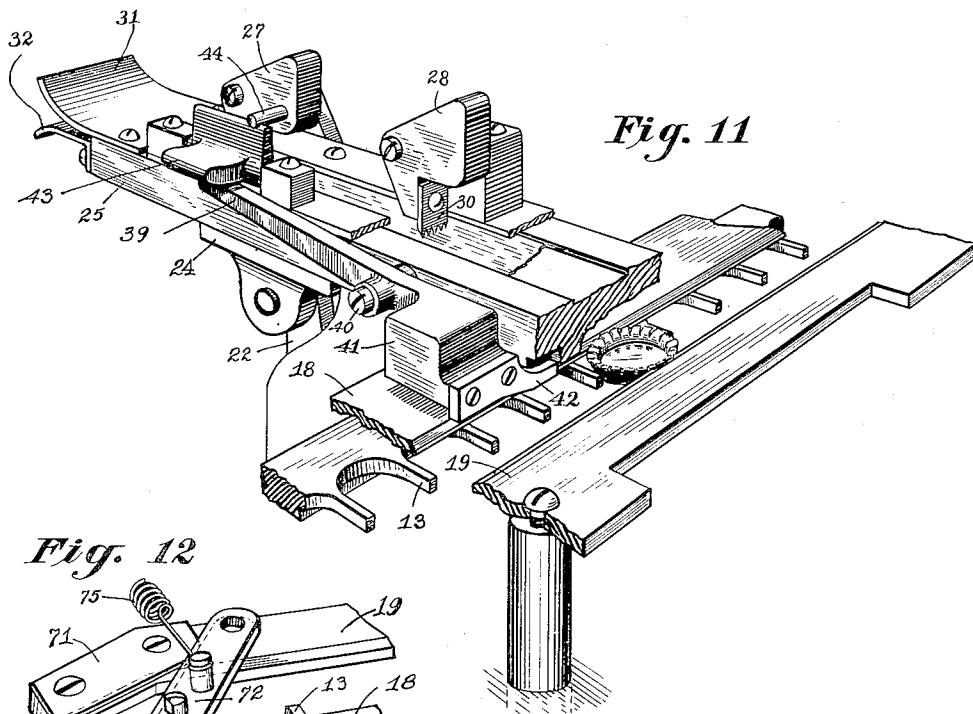
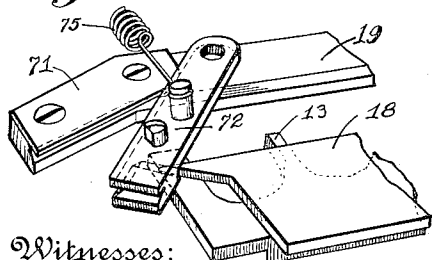


Fig. 12



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UNITED STATES PATENT OFFICE.

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BOTTLE-CAP-ASSEMBLING MACHINE.

1,134,031.

Specification of Letters Patent.

Patented Mar. 30, 1915.

Application filed August 20, 1913. Serial No. 785,637.

To all whom it may concern:

Be it known that I, ROBERT G. CLARK, a citizen of the United States, and resident of the city of New York, borough of Brooklyn, county of Kings, and State of New York, has invented certain new and useful Improvements in Bottle-Cap-Assembling Machines, of which the following is a specification.

10 This invention relates to a machine for assembling bottle caps. These caps consist of a metal cup shaped member having a facing of cork in the form of a flat disk secured to the inner surface of the cap.

15 The object of the invention is to provide a machine for placing these cork facings in position and securing the same in the cap automatically.

20 In the machine embodying the invention as illustrated in the accompanying drawings a flat rotary table receives the metal caps from a hopper, the caps being fed to the table by a chute. These caps are formed with a flaring edge which is utilized as a means for supporting the caps while the same are being advanced through the successive operations thereupon. The caps are carried forward by the rotary table into position to be engaged by a shifter finger, 30 by means of which the same are moved upon a pair of parallel supporting rails upon which the caps are supported by their flaring edges.

35 The feeding mechanism comprises a finger bar of peculiar construction to which is imparted a rotary motion enabling it to engage the caps carried by the supporting rails during a portion of its movement and advance the same successively with an intermittent movement along the supporting rails. This feeding mechanism, while peculiarly adapted for use in this machine, may also be adapted for use in other machines and mechanisms for various purposes where 45 a feeding device is useful.

50 The next step in the operation of assembling is the placing of an adhesive, such as a gummed disk of paper or other suitable material, in the cap for securing the cork disk in position. For this purpose an automatic mechanism is provided which punches the gummed disks from a strip and positions the same in the caps. Means are also provided for preventing the operation of 55 this mechanism except when the caps are

being fed thereto by the feeding mechanism. The caps are next advanced along the supporting rails by the feeding mechanism over burners or other heating means which melts or softens the adhesive material to the 60 proper consistency to hold the cork facing. The cork facings, usually in the form of flat disks, are fed by a suitable mechanism which operates automatically to place the same in position in the cap. Means are also provided in connection with this mechanism 65 which automatically prevent the operation thereof if no caps are being fed thereto by the feeding mechanism. After the cork facings have been placed in the caps the feeding mechanism delivers the same to a rotating table upon which are mounted a series of punches or pressure plungers which press the cork facings against the adhesive material in the caps and hold the same together 75 while cooling and finally release and deliver the assembled caps.

The above and other features of the invention will be described more fully hereinafter in connection with the description of 80 the machine shown in the accompanying drawings as illustrative of one operative embodiment of the same.

In the drawings like parts in the several views have been given the same reference 85 numerals.

Figure 1 is a plan view of one end of the machine. Fig. 2 is a plan view of the opposite end of the same. (Figs. 1 and 2 form one complete plan view of the machine.) 90 Fig. 3 is an enlarged sectional view on the line 3—3 of Figs. 1 and 4. Fig. 4 is an enlarged side elevation, partly in section, on the line 4—4 of Figs. 1 and 3. Fig. 5 is an enlarged sectional view on the line 5—5 of 95 Figs. 2 and 8. Fig. 6 is a side elevation of Fig. 5. Fig. 7 is a sectional view on the line 7—7 of Figs. 2 and 8. Fig. 8 is a plan view of Figs. 5, 6 and 7, partly broken away. Fig. 9 is a detail sectional view on 100 the line 9—9 of Fig. 8. Fig. 10 is a perspective view of the right hand end of Fig. 1. Fig. 11 is a perspective view of a portion of Fig. 3. Fig. 12 is a perspective view of a portion of Figs. 2 and 8. 105

A flat rotary table 1 is rotated in the direction indicated by the arrow in Figs. 1 and 10 by the vertical shaft 2 driven by the bevel gears 3 and 4 from the main driving shaft 5. This shaft is driven by means 110

of suitable pulleys, such as 6, shown in Fig. 2. The caps are fed to the table 1 from a chute, not shown, the caps being indicated by the dotted circles in Fig. 1 and are carried between the horizontal guides 7 and 8 by the movement of the table 1.

The shifter finger 9 is pivoted at 10 and is oscillated by a link 11 acting in conjunction with a spring 12 and successively engages the caps, pushing the same to the left into position to be engaged by the finger bar 13.

The finger bar 13 consists of a long flat bar slidably mounted and provided with a series of projections on one side spaced to receive the caps, allowing a slight clearance. This finger bar 13 is mounted upon a support 14, shown more clearly in Figs. 7 and 8, which is provided with two extensions 15 and 15' connected to the crank members 16 and 16' mounted upon the vertical shafts 17 and 17', respectively. These shafts are driven by bevel gears from the main shaft 5, as shown. It will thus be seen that a rotary reciprocating movement is imparted to the finger bar 13 which causes the projections thereon to successively engage and advance the caps with an intermittent movement, the throw of the crank members 16 and 16' being substantially equal to the diameter of the cap. As the caps are thus advanced the same are received upon and suspended from a pair of parallel supporting rails 18 and 19, which have their upper inner edges beveled to carry the caps suspended from their flaring edges so that the finger bar engages the body of the cap.

The mechanism for placing the adhesive material in the caps is shown in Figs. 3, 4 and partly in Fig. 11. An eccentric 20 is operated from the shaft 5. The eccentric arm 21 is connected to oscillate a lever 22, which is pivotally mounted at 23. The upper end of the lever 22 operates a slide 24 which is slidably mounted in the cross support 25 by the T shaped member 26. The slide 24 is provided with a projection extending upwardly and over the cross support 25 carrying a weighted pawl 27. A similar pawl 28 is pivotally mounted upon the frame of the machine. The pawl 27 carries a flexible member 29, preferably of rubber, at its lower end and the pawl 28 carries an engaging member 30 similarly located. A strip of gummed paper is fed from a roll, not shown, between the guides 31 and 32 over the cross support 25 and under the portions 29 and 30 of the pawls 27 and 28. The slide 24, carrying the pawl 27 is oscillated and moves the strip of gummed paper along the cross support 25, the strip being held against the return movement by the pawl 28 and its engaging portion 30. It will be seen that a wedging action is produced on the forward movement between the flexible

member 29 on the pawl 27 and the paper strip, holding the paper against the member 26 of the slide 24 and a like action is produced by the pawl 28 against the paper upon the return movement, thus causing the paper strip to be advanced by the forward movement and held against the return movement.

A punch 33 is mounted in a vertically sliding carrier 34 and operated by the eccentric 35 on the shaft 5 through the eccentric arm 36. The punch is positioned over the cross support 25 and the strip of gummed paper, from which disks are punched and dropped into the caps as the same are advanced successively thereunder, carried by the supporting rails 18 and 19. In the recess in the bottom of the punch 33 is positioned a small disk 37 mounted upon a stem 38, which extends through a longitudinal opening in the punch and is provided with an adjustable stop at its upper end. The purpose of this is to cause the disk of gummed paper when cut from the strip to fall into the cap beneath, which might otherwise stick to the punch, the weight of the disk 37 and stem 38 being sufficient to push the disk out.

In case no caps are being fed by the finger bar 13 it is desirable to prevent the paper feeding mechanism from operating and for this purpose a weighted lever 39 is pivoted to the frame at 40. This lever is provided at one end with a weight 41 carrying a contact piece 42, which is positioned over the path of the caps and holds the lever 39 up, or in its inoperative position while any caps pass under the same. (See Figs. 1 and 11.) When there are no caps being fed the weighted end of the lever 39 falls and the opposite end is raised and engages a pivoted latch 43, (see Figs. 4 and 11,) swinging the upper end of the same inwardly into the path of a pin 44 on the pawl 27, holding the same out of engagement with the gummed strip of paper and preventing the feeding until released by the raising of the inner end of the lever 39 by the caps again passing under the same. It will thus be seen that the operation of this mechanism is controlled automatically by the presence or absence of the caps which are to receive the adhesive material supplied thereby.

After the adhesive material is placed in the caps, as just described, the same are advanced along the supporting rails 18 and 19 by the finger bar 13 over the flames from a number of gas jets supplied from a perforated pipe 45, shown in Fig. 3, or other suitable heating means. This melts or softens the adhesive material preparatory to receiving the cork facings. During this portion of their travel the caps are held against displacement on the supporting rails 18 and 19 by means of a bar 46, shown in Fig. 1, which

is positioned over the path of the caps and rests lightly thereon and is hinged at one side, as at 47 and 48, to the frame and provided with a weighted handle 49 extending on the opposite side. This construction permits the bar 46 to be raised to provide access to the caps for removing any that may become displaced, etc.

The mechanism for placing the cork facings in the caps is shown in Figs. 5 to 8 inclusive. These facings are in the form of disks of cork cut to size and placed in a vertical tube 50. An eccentric 51 on the shaft 5 is connected by the pitman rod 52 to a pivoted lever 53, which, in turn, is operatively connected to and oscillates a slide 54. On the forward movement a shoulder on the slide 54 engages a cork shifter slide 56, which is provided with a semi-circular recess at one end for engaging the lowermost of the cork disks in the tube 50 and moving the same forward beneath the plunger 57 over one of the caps advanced by the finger bar 13 upon the rails 18-19. On the return movement of the slide 54 the rear end engages a latch 55, which is pivotally attached to the cork shifter slide 56.

The plunger 57 is carried in a sliding head 58 mounted on the frame and operated by an eccentric arm 59 from the eccentric 51. The plunger 57 carries a sleeve 60 which has a tapered lower end and is slidably mounted upon the plunger and supported by a spring 61. The purpose of this sleeve is to locate or center the cap beneath the plunger so that the cork facing will be properly placed or positioned therein. Means are provided for preventing the operation of this mechanism and stopping the feeding of the cork facings when there are no caps being fed beneath the plunger. These means are shown in Figs. 7 and 8 and consist of a lever 62 pivotally mounted upon the frame of the machine at 63 and provided at one end with a foot piece 64 which rests upon the caps as the same are advanced thereunder. The lever 62 is thus normally held in inoperative position and permits the cork feeding mechanism to operate as just described. Should no caps be present, however, the inner end 64 of the lever 62 being unsupported allows the outer end to be raised by the action of the spring 65 and its plunger 65' positioned beneath the outer end of the lever 62. A projection 55' from the latch 55 passes between the end of the lever 62 and the plunger 65' and the latch 55 is thereby raised out of engagement with the slide 54, consequently, the cork shifter slide 56 is not returned with the return movement of the slide 54 and the feeding of the corks is thus automatically prevented as long as no caps are being advanced by the finger bar.

The caps are now delivered to a rotating table 66, which is revolved by the vertical shaft 67 driven by a worm and gear from the main shaft 5, as shown in Fig. 2. Upon the table 66 a number of pressure plungers 68 are mounted, these being indicated in Figs. 2 and 8 and shown in detail in Fig. 9. The plungers 68 are slidably mounted in a bracket 69 attached to the table 66. A spring 70 normally holds the plunger 68 against the cork facing in the cap and presses the same together while cooling, this taking place during one revolution of the table 66.

The end of the supporting rail 19 is bent to extend angularly over the revolving table 66 and a flat cap 71 is secured on top of this angular portion extending over the beveled edge for holding the flaring edge of the caps as the same are fed upon the table by the movement of the finger bar 13. (See Figs. 8 and 12.) A swinging finger 72 is pivotally mounted upon the rail 19 and extends over the table 66. The end of this finger 72 is swung out of the path of the caps successively by engagement with the plungers 68 and as the plunger ahead of the one about to receive the cap passes out of engagement with the finger the finger 72 the same snaps back, by the action of the spring 75, against the cap, which has just been advanced upon the table 66 by the finger bar 13, and positions the cap against the shoulder 66' on the table 66 and the rail 19, with its flaring edge under the cap 71, and holds the cap until the following plunger 68, which passes off from the cam 73, engages the same. The cam 73 is stationary and positioned in the path of the plungers 68, the outer end being inclined engages in a slot in the plungers 68, as shown in Figs. 2 and 9, and raises the same successively from the caps, which are thus released and removed from the table by the further movement of the same under the ejector finger 74, which is mounted on the frame of the machine and extends over the table 66 in the path of the caps when released by the plunger 68, as just described.

As many changes could be made in the above construction and many apparently widely different embodiments of my invention designed without departing from the scope thereof I intend that all the matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative merely of an operative embodiment of my invention and not in a limiting sense.

What I claim is:—

1. In a machine for assembling bottle caps and the like, in combination, means for receiving the caps, a pair of parallel supporting rails upon which the caps are suspended from their flaring edges, means for shifting

the caps successively to the supporting means, a hinged bar positioned over the path of the caps upon said rails and resting lightly thereupon to prevent their displacement, means for advancing the caps successively upon said supporting rails during the operation of assembling, means for placing an adhesive in said caps, means adapted to automatically control the operation of said adhesive placing means, means for heating the cap and adhesive therein, means for placing cork facings in said caps, means adapted to automatically control the operation of said cork placing means, means for pressing the cork facings and caps together against the adhesive, and means for delivering the assembled caps from the machine.

2. In a machine for assembling bottle caps and the like, in combination, means for receiving the caps, means for shifting the caps successively to a supporting means upon which the caps are supported and guided in a straight path, means for advancing the caps successively upon said supporting means during the operation of assembling, a pawl carried by an oscillating slide adapted to feed a strip of adhesive paper to a punch, a punch positioned over the path of the caps adapted to punch disks from the strip of adhesive paper and place the same successively in the caps, a lever having one end weighted and positioned over the path of the caps and held thereby in its inoperative position and having its opposite end arranged and adapted to hold said feeding pawl in an inoperative position when no caps are being fed, means for heating the cap and adhesive therein, means for placing cork facings in said caps, means for pressing the cork facings and caps together against the adhesive, and means for delivering the assembled caps from the machine.

3. In a machine for assembling bottle caps and the like, in combination, means for receiving the caps, means for shifting the caps successively to a supporting means upon which the caps are supported and guided in a straight path, means for advancing the caps successively upon said supporting means during the operation of assembling, means for placing an adhesive in said caps, means for heating the cap and adhesive therein, a cork shifter slide for feeding the cork facings to the caps, a latch pivotally attached to said cork shifter slide and normally engaging an oscillating slide, a lever having one end positioned over the path of the caps and held thereby in its inoperative position and having its opposite end arranged and adapted to automatically control the position of said latch and the movement of said cork shifter slide, means for pressing the cork facings and caps together against the adhesive, and means for delivering the assembled caps from the machine.

4. In a machine for assembling bottle caps and the like, in combination, means for receiving the caps, means for shifting the caps successively to a supporting means upon which the caps are supported and guided in a straight path, means for advancing the caps successively upon said supporting means during the operation of assembling, means for placing an adhesive in said caps, means for heating the cap and adhesive therein, means for placing cork facings in said caps, a revolving table upon which the caps are received, a series of pressure plungers mounted on said table adapted to press the cork facings and caps together against the adhesive, means actuated successively by said plunger for positioning and holding the cap in position to be engaged by the following plunger, and means for delivering the assembled caps from the machine.

5. In a machine for assembling bottle caps and the like, in combination, means for receiving the caps, means for shifting the caps successively to a supporting means upon which the caps are supported and guided in a straight path, means for advancing the caps successively upon said supporting means during the operation of assembling, means for placing an adhesive in said caps, means for heating the cap and adhesive therein, means for placing cork facings in said caps, a revolving table upon which the caps are received, a series of pressure plungers mounted on said table adapted to press the cork facings and caps together against the adhesive, a spring actuated finger extending over said table in the path of the caps and successively engaged by said plungers to move the same out of the path while each cap is being fed to the table and adapted when released to position and hold the cap in position to be engaged by the following plunger, and means for delivering the assembled caps from the machine.

6. In combination, means for feeding the caps, means for placing an adhesive in said caps, means for placing cork facings in said caps, a revolving table upon which the caps are received, a series of pressure plungers mounted on said table adapted to press the cork facings and caps together against the adhesive, a finger extending over the table into the path of the caps and successively engaged by said plunger to move the same out of the path while each cap is being fed to the table, and adapted when released to position and hold the cap in position to be engaged by the following plunger and means for delivering the assembled caps from the machine.

7. In a machine for assembling bottle caps and the like, in combination, means for receiving the caps, a pair of parallel supporting rails upon which the caps are suspended from their flaring edges, means for shifting

the caps successively to the supporting means, a hinged bar positioned over the path of the caps upon said rails and resting lightly thereupon to prevent their displacement, and means for advancing the caps successively upon said supporting rails during the operation of assembling.

8. In a machine for assembling bottle caps and the like, in combination, a rotary table, means for feeding the caps to said table, a pair of guides extending over said table, a pair of supporting rails upon which the caps are adapted to be received from said table, a reciprocating finger bar arranged under said supporting rails, and adapted to shift said caps successively along said rail, an oscillating shifter finger extending over said table and adapted to successively engage the caps and shift them to the supporting means, said shifter finger being actuated by the motion of said finger bar.

9. In a machine for assembling bottle caps and the like, in combination, means for successively feeding the caps means for placing an adhesive in said caps, means for heating the caps and adhesive therein, means for placing cork facings in said caps, a revolving table upon which said caps are received, a series of plungers mounted upon said table adapted to press the facings and caps together upon the adhesive, means successively operated by said plungers for positioning and holding the caps for engagement by the following plunger and means for delivering the finished cap from the machine.

10. In a bottle cap assembling machine, and the like, in combination, means for feeding the caps, means for placing an adhesive in said caps, means for heating the cap and adhesive, means for placing a cork facing in said caps, a rotary table upon which the caps are received, a series of pressure plungers on said table, an annular shoulder formed on said table, a stationary member extending over said table, a spring actuated finger extending over the said table in the path of the caps, and successively engaged by said plungers to move the same out of the path while each cap is fed to the table and adapted when released to force said cap against said annular shoulder and said sta-

tionary member for engagement by the following plunger and means for delivering the assembling caps from the machine.

11. In a machine for assembling bottle caps and the like, in combination, a supporting means, means for advancing the caps intermittently upon said supporting means during the operation of assembling, means for intermittently feeding a strip of adhesive paper over the caps during the period of advancement of said caps, a punch positioned over the path of the caps adapted to punch disks therefrom and place the same successively in the caps during the period of rest, and means controlled automatically by the caps to control the operation of said strip feeding means.

12. In a machine for assembling bottle caps and the like, in combination, means for delivering the caps, a rotary table upon which the caps are received, a pair of parallel supporting rails, a reciprocating finger bar adapted to engage and advance the caps successively during the operation of assembling, means for successively shifting said caps to said supporting rails comprising a pair of horizontal guides extending from said table and between which the caps are carried by the rotation of said table and an oscillating shifter finger operated by the reciprocation of said finger bar adapted to successively engage the caps and place the same in position to be engaged by the finger bar.

13. In a machine for the manufacture of bottle closures of the cap variety, the combination with transporting means for a metallic cap, of means for cutting a disk from a strip of binding material and inserting it into the cap, means for feeding the strip to said cutting means, and means for rendering said feeding means inoperative if said transporting means fails to bring a cap into registering position with said inserting means.

Signed at the city of New York, in the county and State of New York, this 18th day of Aug., 1913.

ROBERT G. CLARK.

Witnesses:

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