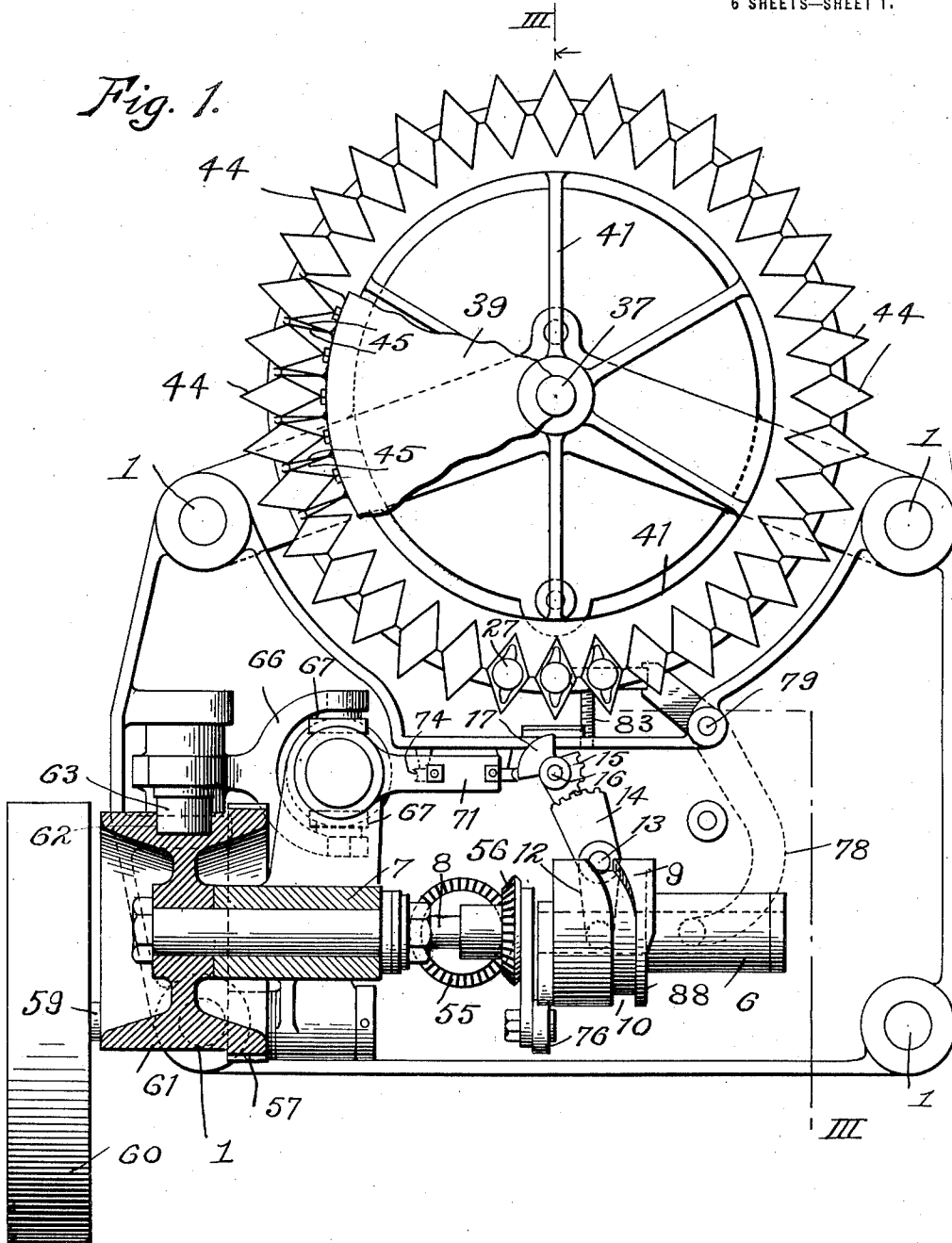


E. NORDSTROM.
BOTTLE CAPPING MACHINE.
APPLICATION FILED JULY 22, 1916.

1,303,581.

Patented May 13, 1919.

6 SHEETS—SHEET 1.



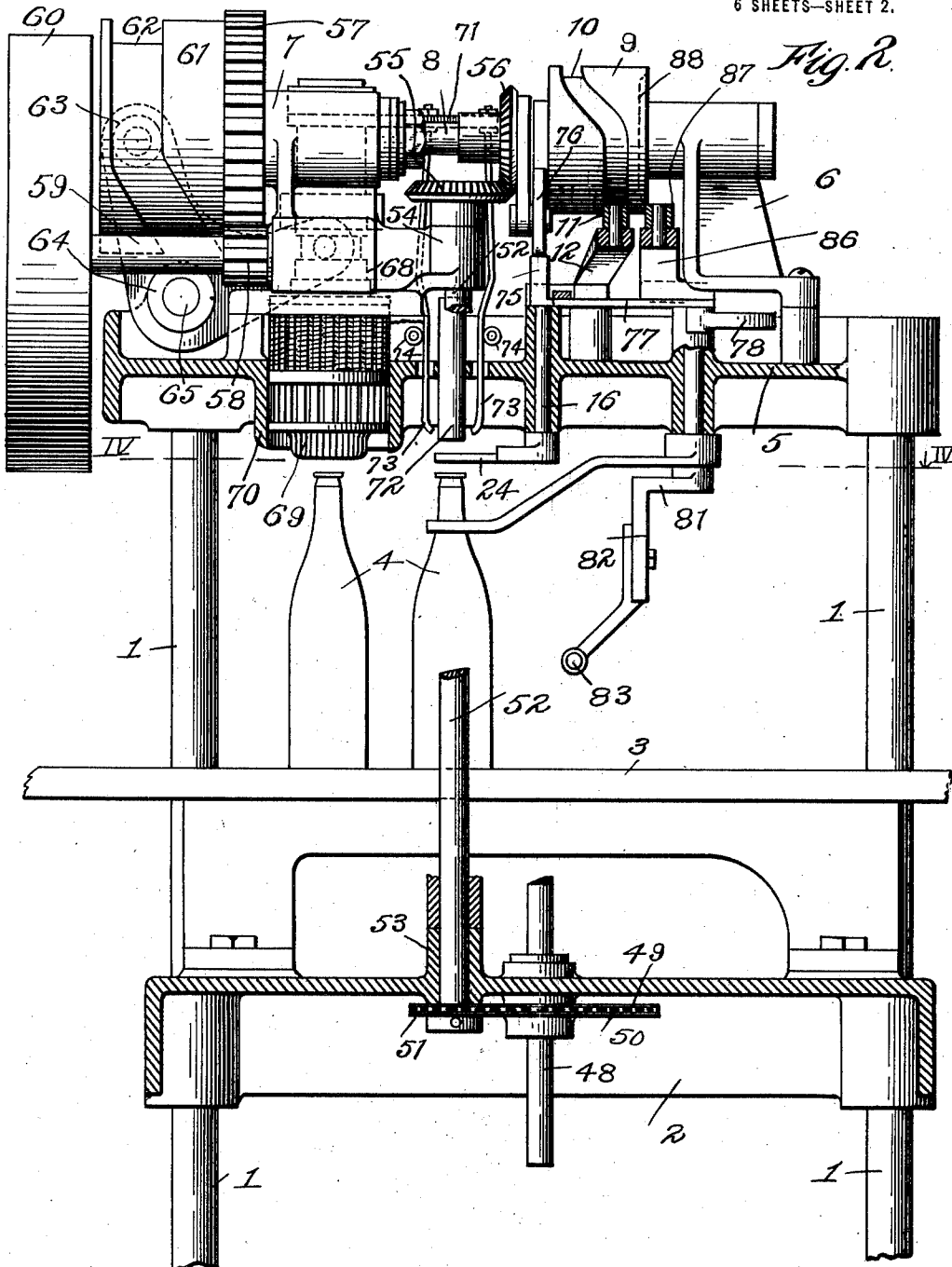
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6 SHEETS—SHEET 2.



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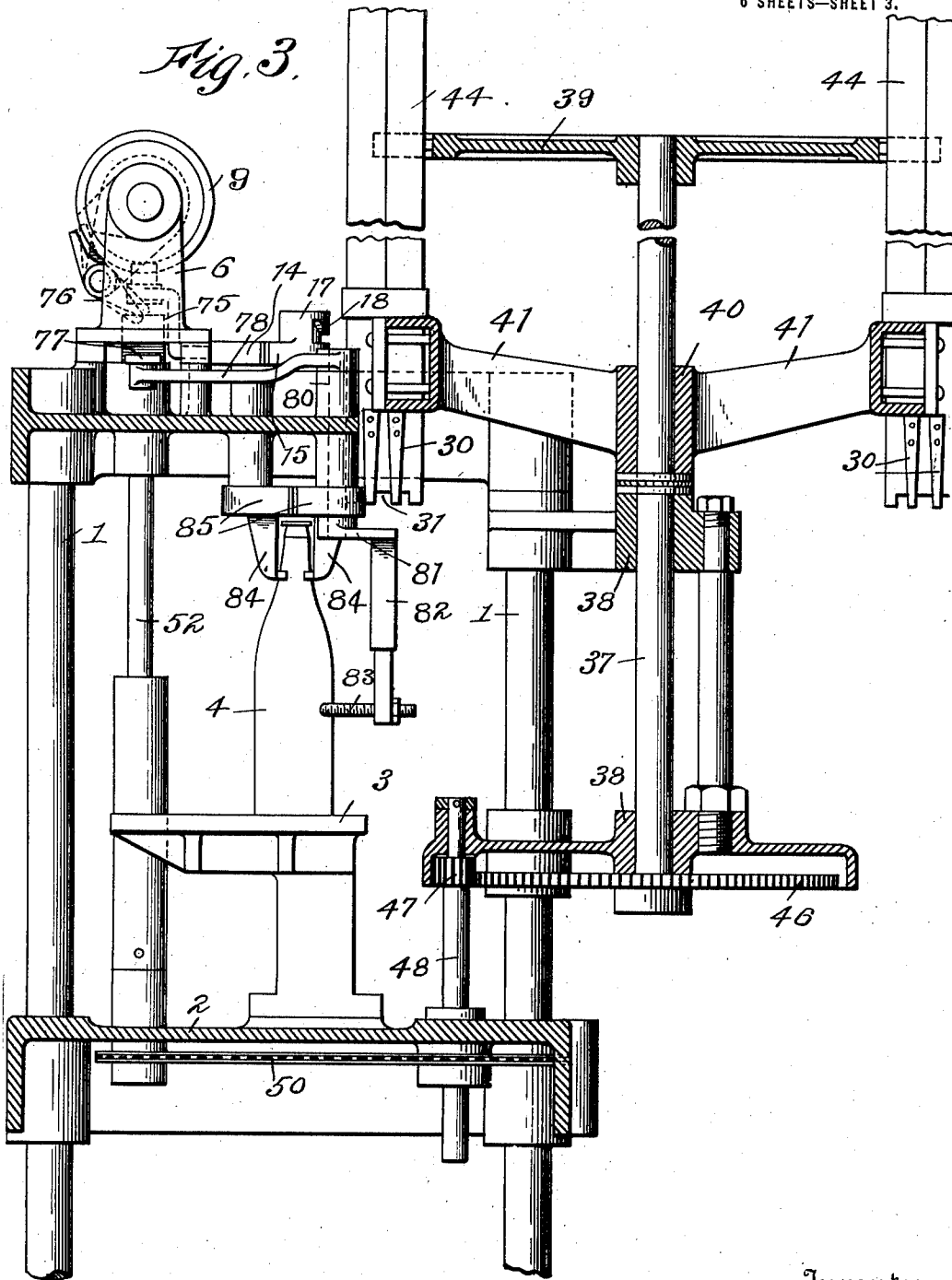
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6 SHEETS—SHEET 3.

Fig. 3.



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6 SHEETS—SHEET 4.

Fig. 4.

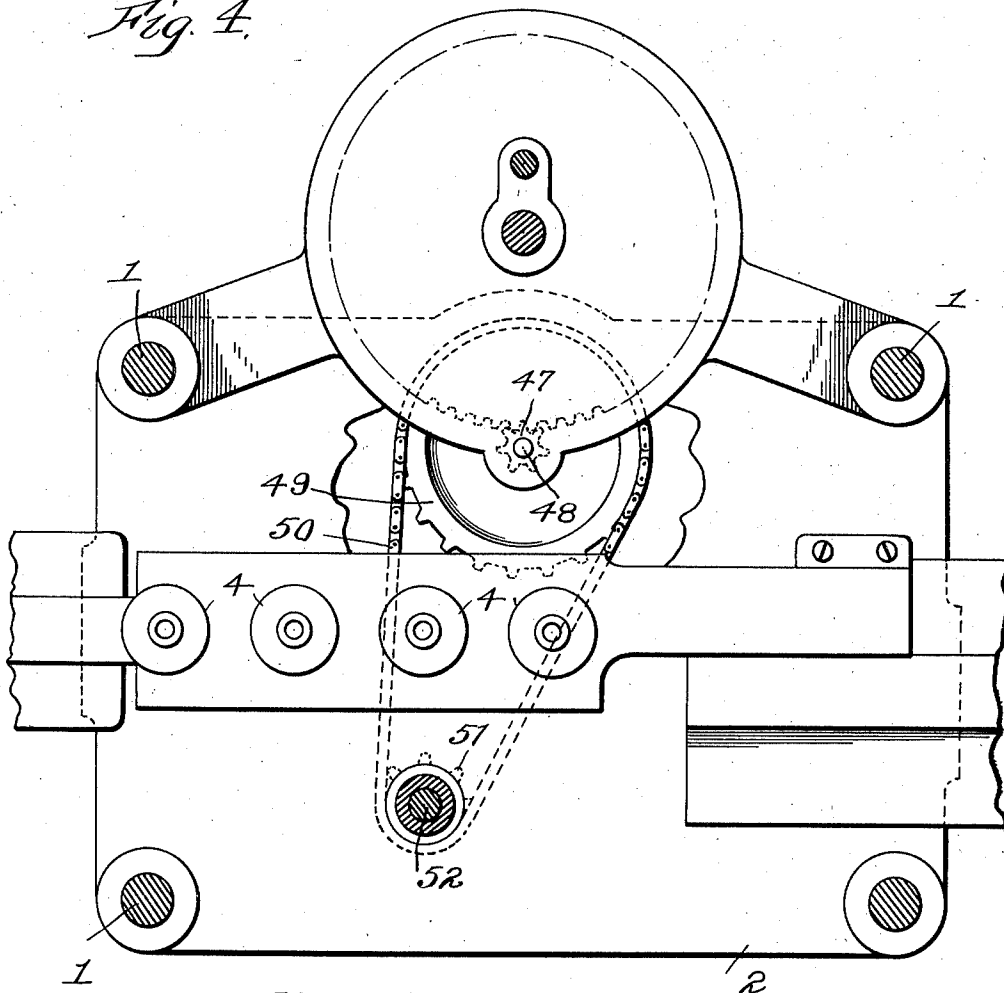
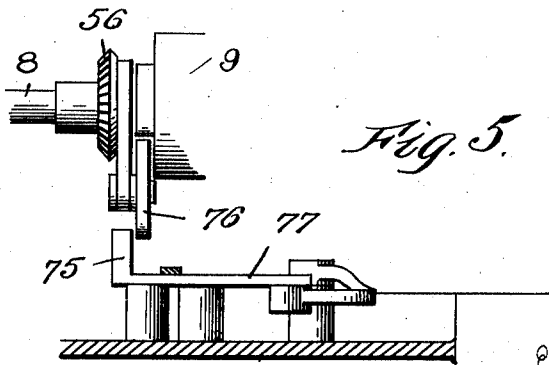


Fig. 5.

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6 SHEETS—SHEET 5.

Fig. 6.

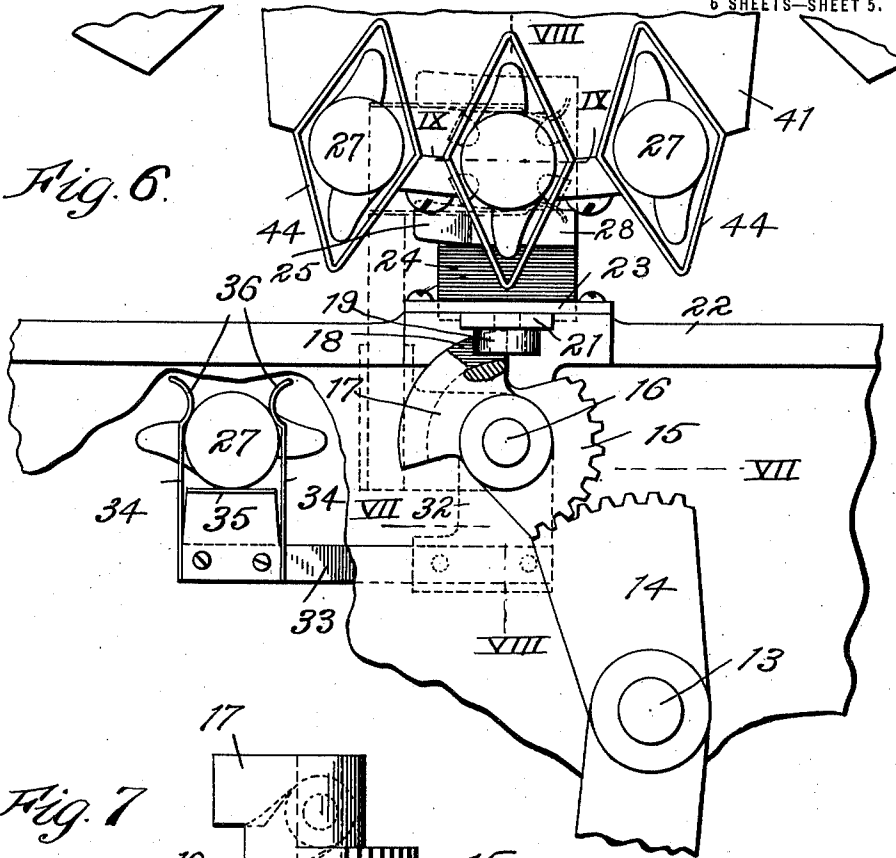
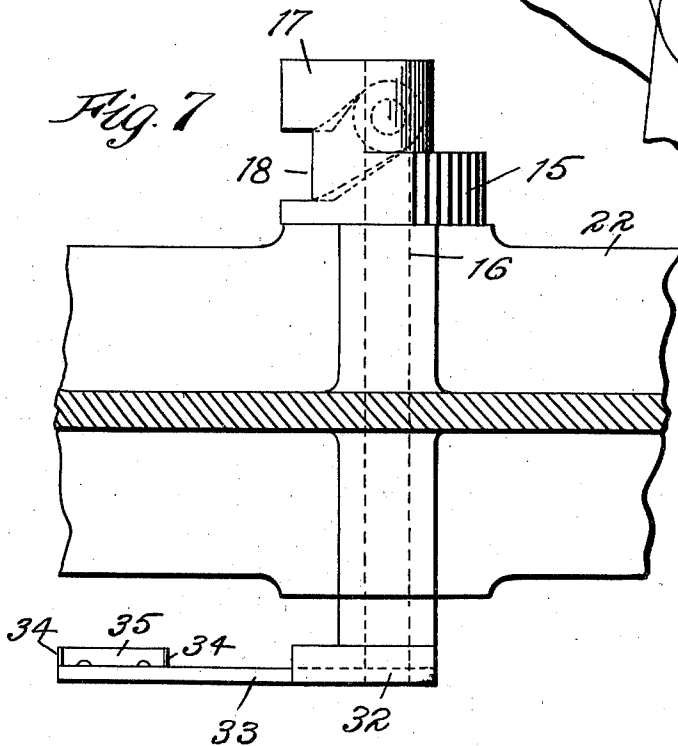


Fig. 7.



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6 SHEETS—SHEET 6.

Fig. 8

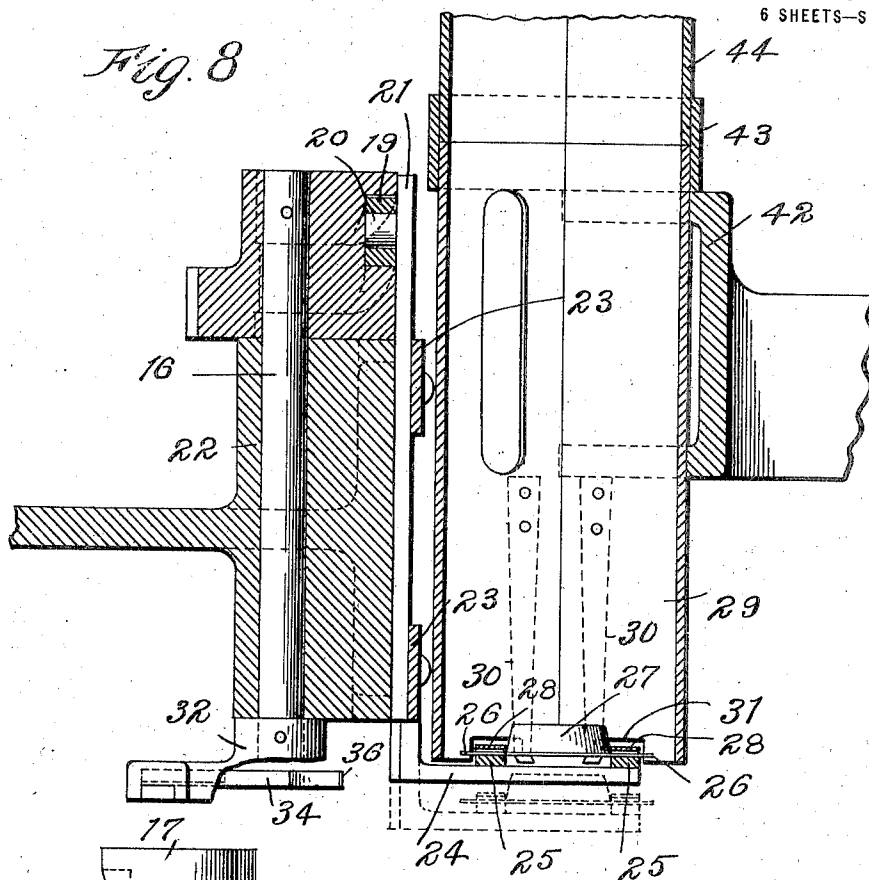


Fig. 9

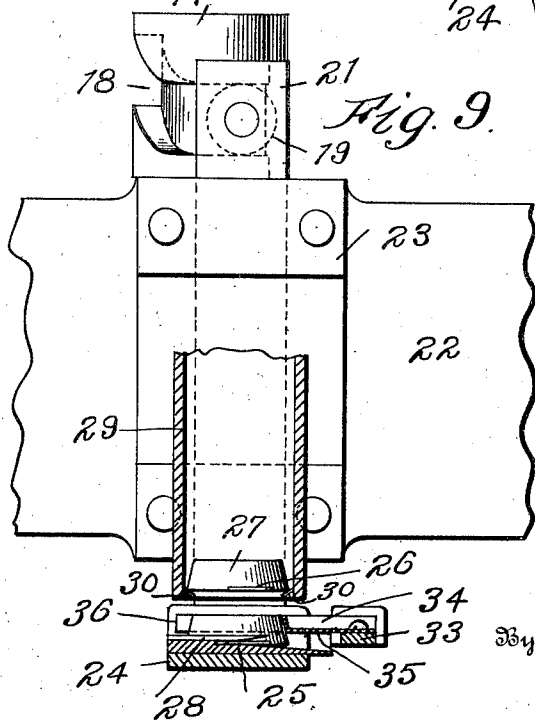
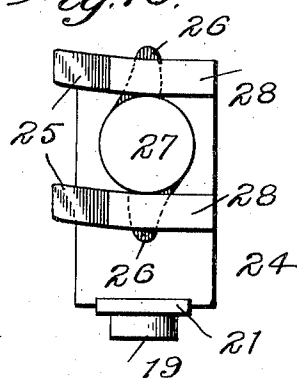


Fig. 10



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UNITED STATES PATENT OFFICE.

ELOF NORDSTROM, OF NEWARK, NEW JERSEY, ASSIGNOR TO AMERICAN DAN STOPPER COMPANY, OF BRIDGEPORT, CONNECTICUT, A CORPORATION OF CONNECTICUT.

BOTTLE-CAPPING MACHINE.

1,303,581.

Specification of Letters Patent.

Patented May 13, 1919.

Application filed July 22, 1916. Serial No. 110,654.

To all whom it may concern:

Be it known that I, ELOF NORDSTROM, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Bottle-Capping Machines, of which the following is a specification.

This invention relates more especially to bottle capping machines in which caps are taken from containers into which they have previously been packed by another machine and applied to bottles and crimped. The primary object of the present invention is to provide improved means for enlarging the cap-handling capacity of a machine, which embodies certain desirable automatic cap-feeding devices. One of the objects of my invention is to provide improved means for transferring caps from different hoppers successively, to bottles or other vessels which are suitably presented to receive said caps. In this application I do not claim the preliminary crimping means in its broad relation to the final crimping means as this combination is claimed in my earlier application serially numbered 89,363, filed April 6th, 1916. Other and further objects will appear in the specification and be pointed out in the appended claims, reference being had to the accompanying drawings, in which,

Figure 1 is a top plan view of the preferred embodiment of my invention, parts being broken away and parts shown in section;

Fig. 2 is a front elevation of the same, parts being broken away and parts shown in section;

Fig. 3 is a section on the line III—III, Fig. 1, parts being broken away and parts shown in side elevation;

Fig. 4 is a section on the line IV—IV, Fig. 2, parts being omitted;

Fig. 5 is a fragmentary detail of parts shown in the upper right hand corner of Fig. 2, partly broken away and partly shown in section;

Fig. 6 is a fragmentary top plan view on an enlarged scale of portions shown in Fig. 1, parts being broken away and parts shown in section;

Fig. 7 is a section on the line VII—VII, Fig. 6, portions being omitted;

Fig. 8 is a section on the line VIII—VIII, Fig. 6;

Fig. 9 is a combined section and rear elevation corresponding to line IX—IX, Fig. 6, with the parts shown in shifted positions, parts being broken away; and,

Fig. 10 is a top plan view of the cap-intercepting device.

Referring more particularly to the drawings in the embodiment shown therein, the rods 1 serve to mount the framework 2, above which is carried a table 3, for affording a suitable support for bottles 4, which may be fed into and out of cap-applying and cap-securing position by means of any suitable feeding mechanism, such for example as that shown in my copending application, Ser. No. 48,210, filed August 31st, 1915. Secured to the upper ends of the rods 1, is an elongated framework 5, which carries fixed standards or brackets 6 and 7. A shaft 8 is journaled at one end in the bracket 7, its other end being journaled in a sleeve (not shown), which is journaled in the bracket 6, this construction being similar to that shown in the above named application for providing means for throwing the cap-feeding means into and out of operation depending on the presence or non-presence of a bottle to be capped. Keyed to said sleeve is a cam 9, provided with a cam groove 10, which operates a cam roller 11, journaled on the end of a cam arm 12. As shown in Fig. 1, the cam arm 12 is pivoted on a pin 13 and has a segmental gear arm 14 meshing with a sector 15 carried by the upper end of a short shaft 16. As shown in Fig. 7, the segment 15 is integrally formed with a cam block 17 having a cam groove 18 within which travels a cam roller 19 (see Fig. 8) journaled on a pin 20, carried by the upper end of a slide 21, which travels in suitable guides formed on an elongated bearing 22 by means of suitable straps 23. The lower end of said slide carries a laterally projecting arm 24, which, when said slide is in its uppermost position, is in position to intercept the lowermost cap in any one of a series of cap holding hoppers to be presently referred to. For this purpose, the radial arm 24 of said slide (see Fig. 10) is provided

with spaced lower guides 25 which are adapted to engage the ears or lugs 26 of the lowermost cap 27 in any of the hoppers, said hoppers being suitably formed and disposed to hold the ears or lugs of said caps in a predetermined position. Arranged above the guides 25 and spaced therefrom a suitable distance to accommodate the ears or lugs 26, are a pair of upper guides 28 between which and the lower guides, the ears of lugs 26 are caught. The movements of the slide 21 are suitably timed to effect a downward displacement to the lowermost cap, immediately after said cap has entered between these guides.

As shown in Figs. 1, 6, 8 and 9, a plurality of hoppers preferably in the form of diamond shaped tubes 29 are provided adjacent their lower ends with leaf springs 30 having their lower extremities deflected inwardly to engage under the lowermost cap. Said hoppers are recessed at 31 to accommodate the guides 25 and 28 during the rotary movement of the table, to be hereinafter described. Keyed to the lower end of the shaft 16 is a bracket 32 which carries a laterally projecting arm 33. A pair of spaced yieldable cap gripping members 34 are suitably mounted on the outer end of the arm 33 to releasably hold a cap 27 against an abutment 35, also carried by the arm 33. The outer ends of the yieldable arms 34 are bowed at 36 to adapt the cap 27 to be forced into and out of engagement with the arms 34. Whenever the shaft 16 is oscillated on its axis, the arms 34 are swung into position above the upper guides 28 on slide 21 to engage the crown portion of the cap, said slide during each of such periods being in its lowermost position. In order to provide suitable means for movably mounting the tubular hoppers 29, a shaft 37 is journaled in vertically spaced bearings 38 and as shown in Fig. 3, carries at its upper end a spider 39. Adjacent the upper bearing 38, the hub 40 of a heavier spider is keyed to the shaft 37, the outer ends of the arms 41 of which being provided, as shown best in Fig. 8, with box-like sockets 42 for holding the hoppers 29. The upper ends of each of the hoppers 29 terminate in a band 43 which provides a socket for the lower end of a tubular extension 44. These tubular extensions 44 are removable for filling whenever the column of caps fall below the band 43. In order to releasably hold these tubular extensions in position, the upper spider 39 is provided with a plurality of pairs of yieldable gripping elements 45 which serve to hold the tubular extensions 44 in position until such time as it becomes desirable to remove the same for filling. Keyed to the lower end of the shaft 37 is a spur gear 46 which meshes with a pinion 47 keyed to a short shaft 48, the lower end of the shaft 48 having keyed thereto a sprocket 49. A chain 50 runs about the sprocket 49 and over to a second sprocket 51 which is keyed to the lower end of a shaft 52. As shown best in Fig. 2, the shaft 52 is journaled below in a bearing 53 carried by the frame work 2, and above is journaled in a bearing 54, which is rigid with the upper framework 5. Keyed to the upper end of the shaft 52, is a bevel gear 55, which meshes with a bevel gear 56 keyed to the sleeve hereinbefore referred to, but not shown on the drawings. Keyed to the shaft 8 is a spur gear 57 which is driven by a pinion 58, keyed to the shaft 59, which carries at its outer end, a fly-wheel pulley 60, said pulley being available for a belt drive if desired. Also keyed to the shaft 8, is a cam block 61 provided with a cam groove 62 within which runs a cam roller 63 carried by one arm of bell crank lever 64 which is journaled on a pin 65. The other arm 66 of said lever is bifurcated and carries oppositely arranged blocks 67 which interengage in a groove formed in a reciprocable head 68 which carries coaxially therewith a cap crimping head 69 which is reciprocably mounted in a cylindrical guide 70. As shown best in Fig. 1, the reciprocable head 68 is provided with a lateral extension 71 which carries a depending plunger 72 for displacing a cap from the yieldable members 34 hereinbefore referred to, when the arm 33 has been oscillated to a position away from the cap-holding hopper end into a position over a bottle 4 which is suitably presented on the table 3 to be capped. If desired yieldable preliminary cap crimping arms 73 may be suspended from the extension 71 on opposite sides of the plunger 72, said arms having outwardly extending portions above a pair of spaced rollers 74. Whenever a downward movement of the plunger 72 takes place, the arms 73 are pressed inwardly by the rollers 74 to impart an initial crimping to the cap on the neck of a bottle. Means for preventing the feed of a cap from a hopper whenever a bottle is not present to receive said cap, is provided similar to that shown and described more fully in the above mentioned copending application, and includes a clutch acting between the shaft 8 and the sleeve within which said shaft is journaled, said clutch being operated by a vertically projecting bar or member 75, which interengages with a pawl 76 and is carried by a slide 77. Pivotally connected to the outer end of the slide 77 is a curved lever 78. The lever 78 is keyed to the upper end of a shaft 79, journaled in a bearing 80 carried by the upper framework 5. The lower end of said shaft 80 carries the radial arm 81 having a downwardly deflected portion 82 which carries a detector or feeler 83. The construction of this device is such that when a bottle 4 is fed along a predetermined path into posi-

tion to be capped, the finger 83 will be displaced thereby in such a manner as to operate the clutch and insure the operation of the mechanism which moves the table for carrying the hoppers successively into position to have the lowermost cap removed therefrom. In the event that there is a bottle present, the upper portions of this mechanism would assume the positions shown in Fig. 5, in which the member 75 is displaced relatively to the pawl 76 thus permitting said pawl to remain in engagement with a ratchet (not shown) as fully shown and described in my above mentioned copending application. A pair of bottle gripping arms 84 may be provided on intermeshing gear segments 85 which are moved into and out of bottle gripping position by means of a cam arm 86 carrying a cam roller 87 which runs over a cam 88. The operation of my improved machine will now be readily understood and briefly described is as follows:

Supposing that the bottles 4 are fed in regular order to the machine. As each bottle is presented below the plunger 72, a cap is applied thereto from the cap-gripping elements 34 which have previously received said cap from the lower end of the slide 21. After a cap has been removed from a hopper 29 by the movement of the slide 21, the shaft 37 is rotated slightly to move the hopper 29 out of alinement with the lower end of the slide 21 and to bring the next succeeding hopper into alinement therewith, so that the next cap is taken from the next hopper and so on. It will be seen therefore, that the hoppers with their extensions 44 being entirely full at the beginning of the operation, the level of the caps within said tubes and hoppers will sink simultaneously. When the level of the caps has sunk below the band 43, the tubular extension 44 may be removed for refilling without interrupting the operation of the machine. The operation of the said machine may therefore be continued uninterruptedly since there is always a residual supply of caps in the hoppers 29 during such time as the tubes 44 may be removed for refilling.

What I claim is:—

1. In a machine of the character described, a reciprocatory head, a cap-applying plunger carried thereby, preliminary crimping means mounted on said reciprocatory head and symmetrically disposed with respect to said plunger, and other crimping means carried by said reciprocatory head for completing the crimping action, by a succeeding stroke of the reciprocatory head.

2. In a machine of the character described, a continuously movable conveyer provided with means for holding caps in predetermined position, means disposed in the path of a cap carried by said conveyer

and adapted to intercept said cap, and means for removing said cap from the intercepting means and applying it to a vessel.

3. In a machine of the character described a continuously movable conveyer provided with means for holding caps in predetermined position, means movable into and out of position to intercept a cap, and means for removing said cap from the intercepting means and applying it to a vessel, said intercepting means being adapted to move the cap into a position in which it is engaged by said cap-removing means.

4. In a machine of the character described, a continuously movable conveyer provided with means for holding caps in predetermined position, means suitably disposed to intercept a cap carried by said conveyer, means for removing said cap from the intercepting means and applying it to a vessel, and means for displacing said cap from said cap-removing means onto a vessel.

5. In a machine of the character described, a conveyer adapted to carry caps, means movable into and out of the path of a cap carried by said conveyer, said means being adapted to remove said cap, cap-gripping means movable into and out of position to engage a cap in said cap-removing means when out of the path of a cap carried by said conveyer, and means for displacing a cap from said cap-gripping means onto a vessel when said cap-gripping means is away from said cap-removing means.

6. In a machine of the character described, a continuously movable conveyer provided with means for holding winged caps in predetermined position, a reciprocable slide provided with means adapted to intercept the wings of a cap as said cap is moved by said conveyer, and means for removing the cap from said intercepting means and applying it to a bottle.

7. In a machine of the character described, a conveyer provided with means for holding winged caps in predetermined position, a reciprocable slide provided with means adapted to intercept the wings of a cap when said slide is in one position and to withdraw said cap from the conveyer, and means for removing the cap from said intercepting means when the slide is in another position and applying it to a bottle, said intercepting means comprising recessed portions, presented toward the direction of approach of a cap carried by said conveyer.

8. In a machine of the character described, a conveyer provided with means for holding winged caps in predetermined position, a reciprocable slide provided with means presented toward an approaching cap carried by said conveyer, said means being adapted to intercept the wings of a cap when said slide is in one position and to

withdraw said cap from the conveyer when said slide is moved from said position, and means for removing the cap from said intercepting means when the slide is in another position and applying it to a bottle.

9. In a machine of the character described, the combination of a rotary table, a hopper mounted on said table, a fixed support adjacent to which said hopper is moved by the rotation of said table, a slide reciprocally mounted on said support, said slide being provided with means for intercepting and removing a cap from said hopper, a shaft journaled in said support, a radial arm carried by said shaft, said radial arm being provided with cap-gripping means cooperating with said intercepting means and adapted to convey a cap from said intercepting means to a position in which the cap is to be applied to a vessel, and a cam keyed to said shaft and operating said slide.

10. In a machine of the character described, the combination with a continuously moving hopper for caps, of a reciprocable slide provided with means presented toward the direction of approach of said hopper for intercepting a cap in one position of said slide, and removing said cap from said hopper, and cap-gripping means movable into position to grip said cap in said intercepting means when distant from its intercepting position.

11. In a machine of the character described, the combination with a hopper for

caps, of a slide reciprocable relatively to said hopper for removing caps therefrom, a vibratory arm provided with means for transferring a cap from said slide to a point over a bottle to be capped, and means for displacing a cap from said vibratory arm on to said bottle, the movement of said slide being parallel to the axis of said hopper, said vibratory arm being movable about an axis parallel to the axis of said hopper.

12. In a machine of the character described, a rotary table, a hopper for caps carried by said table, a shaft oscillatable on an axis parallel to the axis of said rotary table, a radially extending arm keyed to said shaft, said arm being provided with yieldable cap-gripping elements, and a slide reciprocable longitudinally of the axis of said rotary table, said slide being provided with cap-gripping means for withdrawing a cap from said hopper and transferring said cap to the cap-gripping elements.

13. In a machine of the character described, a reciprocatory head provided with a lateral extension, cap-applying means carried by said extension, cap-gripping means mounted on said reciprocatory head, and means for reciprocating said head, said head-reciprocating means including a cam lever pivotally connected to said head on an axis intersecting the axis of said cap-erimping means.

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