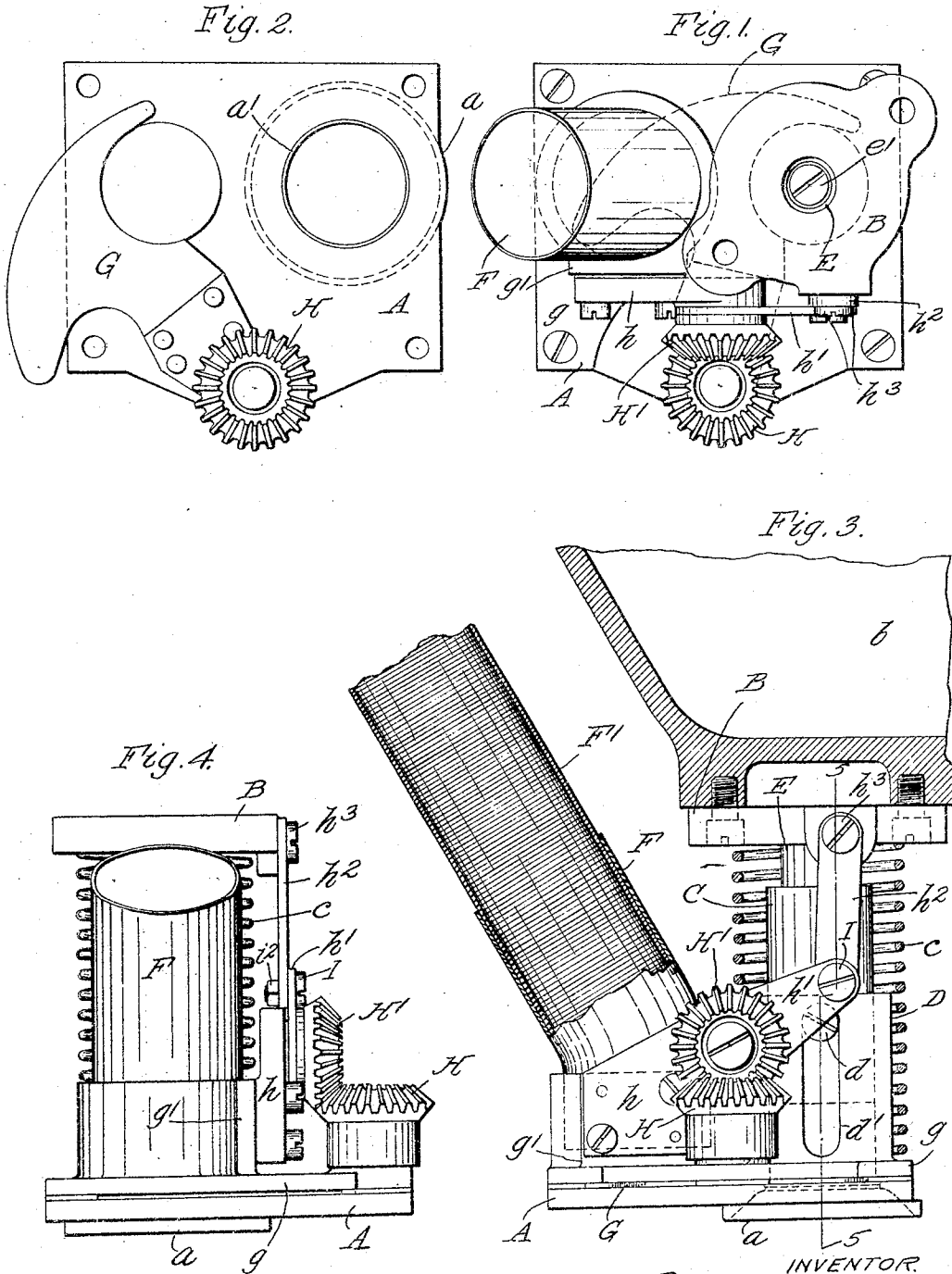


R. N. CUNDALL.
BOTTLE CAPPING DEVICE.
APPLICATION FILED JUNE 19, 1919.

1,403,941.

Patented Jan. 17, 1922.

2 SHEETS—SHEET 1.



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ATTORNEYS.

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Fig. 7

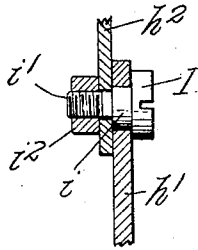


Fig. 5

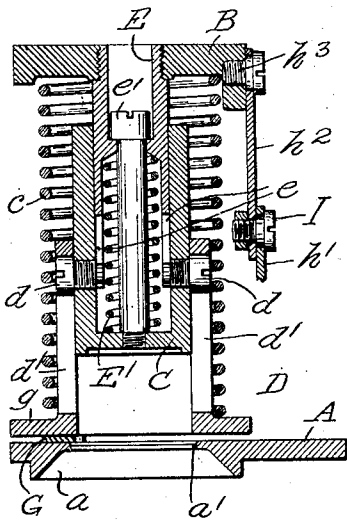
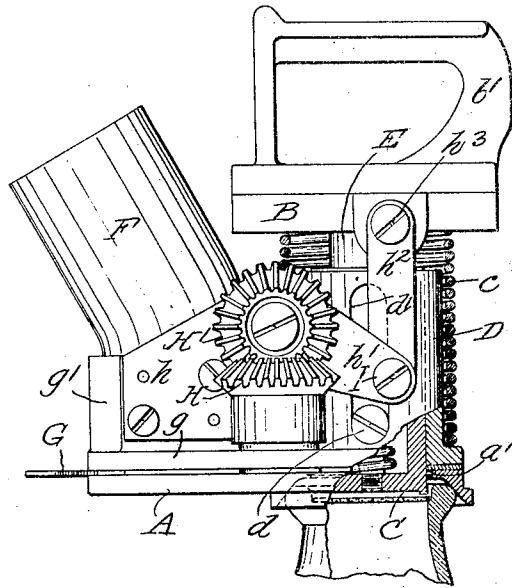


Fig. 6



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UNITED STATES PATENT OFFICE.

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BUFFALO, NEW YORK.

BOTTLE-CAPPING DEVICE.

1,403,941.

Specification of Letters Patent. Patented Jan. 17, 1922.

Application filed June 19, 1919. Serial No. 305,318.

To all whom it may concern:

Be it known that I, ROBERT N. CUNDALL, a citizen of the United States, residing at Blasdell, in the county of Erie and State of New York, have invented a new and useful Improvement in Bottle-Capping Devices, of which the following is a specification.

This invention relates to bottle capping devices of the kind in which relative movement between a part of the capping device and the bottle effects the placing of a cap on a bottle and also the feeding of a cap from a magazine.

The objects of the invention are to provide a bottle capping device of this kind in which the magazine for the caps is so arranged relatively to the other parts of the device that the device may be mounted on the base of the tank or reservoir of a bottle filling machine without making it necessary to provide an irregular shaped or specially made tank; also to provide a device of this kind with a cap feeding mechanism of improved and simplified construction which will be accurate and reliable in operation; also to provide a device of this kind with means of improved construction for preventing injury to the device or to a bottle when an oversized bottle is fed to the device; also to improve the construction of devices of this kind in other respects hereinafter specified.

In the accompanying drawings:

Fig. 1 is a top plan view of a bottle capping device embodying the invention.

Fig. 2 is a top plan view of the base plate of the device removed from the other parts thereof.

Fig. 3 is a front elevation thereof showing the device secured to a tank.

Fig. 4 is a side elevation thereof.

Fig. 5 is a sectional elevation thereof on line 5-5, Fig. 3.

Fig. 6 is a front elevation thereof, partly in section, showing the device provided with a handle for operating the same by hand and showing the parts thereof in the position in which a cap is pressed into a bottle.

Fig. 7 is a fragmentary sectional elevation thereof showing the adjustable connection in the cap feeding mechanism.

A represents the base of the bottle capping device which is provided on its lower face with a flaring bottle-guiding portion *a*

by means of which the bottle is brought into proper operative relation to the device. The upper face of the base plate is provided with the usual cap-retaining seat or portion *a'* in which a cap may be placed over the bottle guiding portion *a* so that the cap can be pushed from the seat through a hole in the base into operative position on the bottle. B represents the usual top plate or member of the capping device, the base and top plate being movable relatively to each other. If the device is used in connection with a machine in which the bottle is raised to the capping device, as shown in Fig. 3, the top plate B is stationary, being secured to a fixed part of the machine such, for example, as a milk tank *b*, shown in Fig. 3. The bottle in this case is raised into engagement with the base and moves the base upwardly relatively to the top plate B. In the construction shown in Fig. 6, the device is adapted for hand operation and the top plate B is provided with a handle portion *b'*. In this case the base plate A is placed into operative relation to a milk bottle and the top plate B is then depressed by means of a handle *b'*.

The means for placing the cap into operative position in a bottle preferably include a plunger C of any suitable or desired construction, which is adapted to move downwardly in a cylindrical guide member D secured to or formed on the base A. The lower end of the plunger is adapted to engage a cap positioned in said seat *a'* and move the same from the seat through the hole in the base and into operative position in the bottle. The plunger C is suitably connected with the top plate B and is preferably held in its upper position by means of a coil spring *c* which, in the construction shown, surrounds the cylindrical guiding member D and the plunger C and acts to yieldingly hold the base A and the top plate B apart. In order to limit the movement of the plunger relatively to the cylindrical guide member D, stop pins or screws *d* are preferably provided which, in the construction shown, are secured to the plunger C and the heads of which are arranged in guide slots *d'* in the cylindrical guide member D.

When the capping device is used in connection with a power-operated machine, it is desirable to provide means for preventing injury to the capping device or to a bottle

in case an exceptionally long bottle is fed to the machine. In the construction shown for this purpose, the plunger C is yieldingly connected with the top plate B, the plunger being made hollow and having a sliding connection with a guide stud or member E rigidly secured to the top plate B, a spring E' being arranged in the hollow plunger C and stud E. The spring E' is preferably made stiffer than the spring c, so that the plunger when operating on bottles of normal size does not move relatively to the top plate. If, however, an exceptionally large bottle is fed to the machine the plunger compresses the spring E' and moves relatively to the top plate. In order to hold the plunger C from rotating relatively to the stud E, the guide stud is preferably provided with slots e in which the ends of the pins or screws d engage. The plunger C is held in operative relation to the stud E by means of a pin e' about which the spring E' is arranged and which limits the outward movement of the plunger with regard to the top plate. In the capping of bottles, when the bottle moves upwardly the base plate A is moved upwardly, causing the plunger C to force a cap into a bottle. During this movement the pins d move from the upper portions of the slots d' to the lower ends thereof. In case an excessively high bottle is fed to the machine, the plunger C will be moved upwardly with the base plate compressing the spring E' as described.

By means of the arrangement described, the spring E', which makes it possible to use the capping device with bottles of exceptional height, does not in any way add to the length or size of the capping device, so that the same may be mounted on the base of the milk receptacle b instead of necessitating the mounting of the capping device at one side of the receptacle, or the cutting away of a part of the receptacle in order to use the capping device in connection with a bottle filling machine.

F represents a magazine for the caps, the upper portion of which is inclined upwardly and outwardly with regard to the capping device, and the lower portion of which is substantially vertical so that the caps are in substantially horizontal planes when discharged from the lower end of the magazine to the base plate. This feature also makes it possible to arrange the capping device on the bottom of a milk receptacle without requiring the milk receptacle to be of an irregular shape. The magazine F may be made to receive cartons F' containing the caps which are discharged from the lower portion of the magazine in parallel relation to the base plate so that the magazine feeds the caps one at a time to the base plate into a position in which the caps may be moved to the cap-retaining seat a'.

The mechanism for moving the caps on the base plate from the cap magazine F to the seat a' in the base plate is preferably constructed as follows:

G represents an oscillatory feeding member which, in the construction shown, is made of sheet metal of substantially the same thickness as the caps and which is slidable in a space between the base plate A and a plate g arranged parallel with the base plate and secured thereto. Means are preferably provided for actuating the feeding member G by the relative movement of the base plate with regard to the top plate. In the construction shown for this purpose, the feeding member is rigidly secured to a beveled gear H suitably journaled on the plate g and meshing with a beveled gear H' journaled on a bracket h which, in the construction shown, is secured to an upwardly extending portion g' of the plate g, forming the base of the magazine F. The beveled gear H' is provided with an arm h' which is connected with the top plate A, for example by means of a link h² pivoted at h³ to a part of the top plate B. When the base A moves relatively to the top plate B, the link h² and arm h' will cause the bevel gears H' and H to turn, which in turn causes the cap feeding member G to oscillate from the cap-receiving position, shown in Fig. 2, to a position in which the cap is fed to the cap-receiving seat a', as indicated in dotted lines in Fig. 1. The cap feeding member is in the position shown in dotted lines in Fig. 1 when the base plate and top plate are in their normal positions, as shown in Fig. 3, and the cap feeding member is moved into position shown in Fig. 2 when the members of the feeding device are in the relative position shown in Fig. 6.

It is desirable to provide means for accurately adjusting the parts of the feeding mechanism in such a manner that the cap feeding member will position the caps correctly in the cap-receiving seat a'. Any suitable means may be employed for accomplishing this result. In the construction shown for this purpose, an adjustable connection is provided between the two links h' h², this connection being in the form of a pin I having an eccentric portion i engaging in a hole in the link h' and a concentric portion i' of reduced diameter engaging in a hole in the link h². The pin is provided with suitable means for holding the same in adjusted position, such as a threaded end, with which a nut i² engages for securing the pin against movement relatively to the link h².

The mechanism for actuating the feeding member is exceedingly simple in construction and reliable in operation. This mechanism can be easily made and contains no parts which are likely to wear in such a manner as to interfere with the proper

operation of the device. The construction and organization of the device are such that the device can readily be used in connection with bottle filling machines without necessitating any special construction of the machines.

I claim as my invention:

1. In a capping device, the combination of two relatively movable parts, a plunger on one of said parts for placing caps into bottles, a cap-receiving seat on the other of said parts, a cap magazine on said other part, an oscillatory feed member pivoted on said other part for moving a cap from said magazine to said seat, a bevel gear secured to said feed member, a second bevel gear meshing with said first mentioned gear, an arm secured to said second bevel gear, and a connection between said arm and said first mentioned part to cause said bevel gears to actuate said feed member when said parts move relatively to each other, said connection being adjustable to permit the movement of said feed member to be varied.

2. In a bottle capping device, the combination of a base member having a seat for a cap and adapted to engage the head of a bottle, a top member, said top member and base member being movable relatively to each other, a hollow plunger movable relatively to said base member to place a cap from said seat into a bottle, a guide member on said top member and extending into said hollow plunger, and a spring in said guide member and bearing on said hollow plunger which normally holds said plunger against movement relatively to said top member when capping bottles, said spring being compressed only when said capping device acts on an over-sized bottle.

3. In a capping device, the combination of two relatively movable parts, a plunger on one of said parts for placing caps into bottles, a cap-receiving seat on the other of said parts, a cap magazine on said last named

part, an oscillatory feed member pivoted on said last named part for moving a cap from said magazine to said seat, a bevel gear fixed to said feed member, a second bevel gear meshing with said first-mentioned gear, and an arm secured to said second bevel gear and connected with said first-mentioned part to cause said bevel gears to actuate said feed member when said parts move relatively to each other.

4. In a capping device, the combination of two relatively movable parts, a plunger on one of said parts for placing caps into bottles, a cap-receiving seat on the other of said parts, a cap magazine on said last named part, an oscillatory feed member pivoted on said last named part for moving a cap from said magazine to said seat, a bevel gear fixed to said feed member, a second bevel gear meshing with said first-mentioned gear, an arm secured to said second bevel gear, and a link pivoted at one end to said arm and at its other end to said first-mentioned part, to cause the bevel gears to actuate said feed member when said parts move relatively to each other.

5. In a capping device, the combination of two relatively movable parts, a plunger on one of said parts for placing caps into bottles, a cap-receiving seat on the other of said parts, a cap magazine on said last-named part, an oscillatory feed member pivoted on said last-named part for moving a cap from said magazine to said seat, and a pair of bevel gears for actuating said feed member when said parts are moved relatively to each other, one of said bevel gears being connected with said feed member and the other gear being connected with said first mentioned part.

Witness my hand, this 17th day of June, 1919.

ROBERT N. CUNDALL.

Witness:

M. J. PITMAN.