W. G. PALMER.

CAN CAP PLACING MACHINE.

APPLICATION FILED MAR. 24, 1909.

947,685.

Patented Jan. 25, 1910.

3 SHEETS—SHEET 1.

Fig. 1.

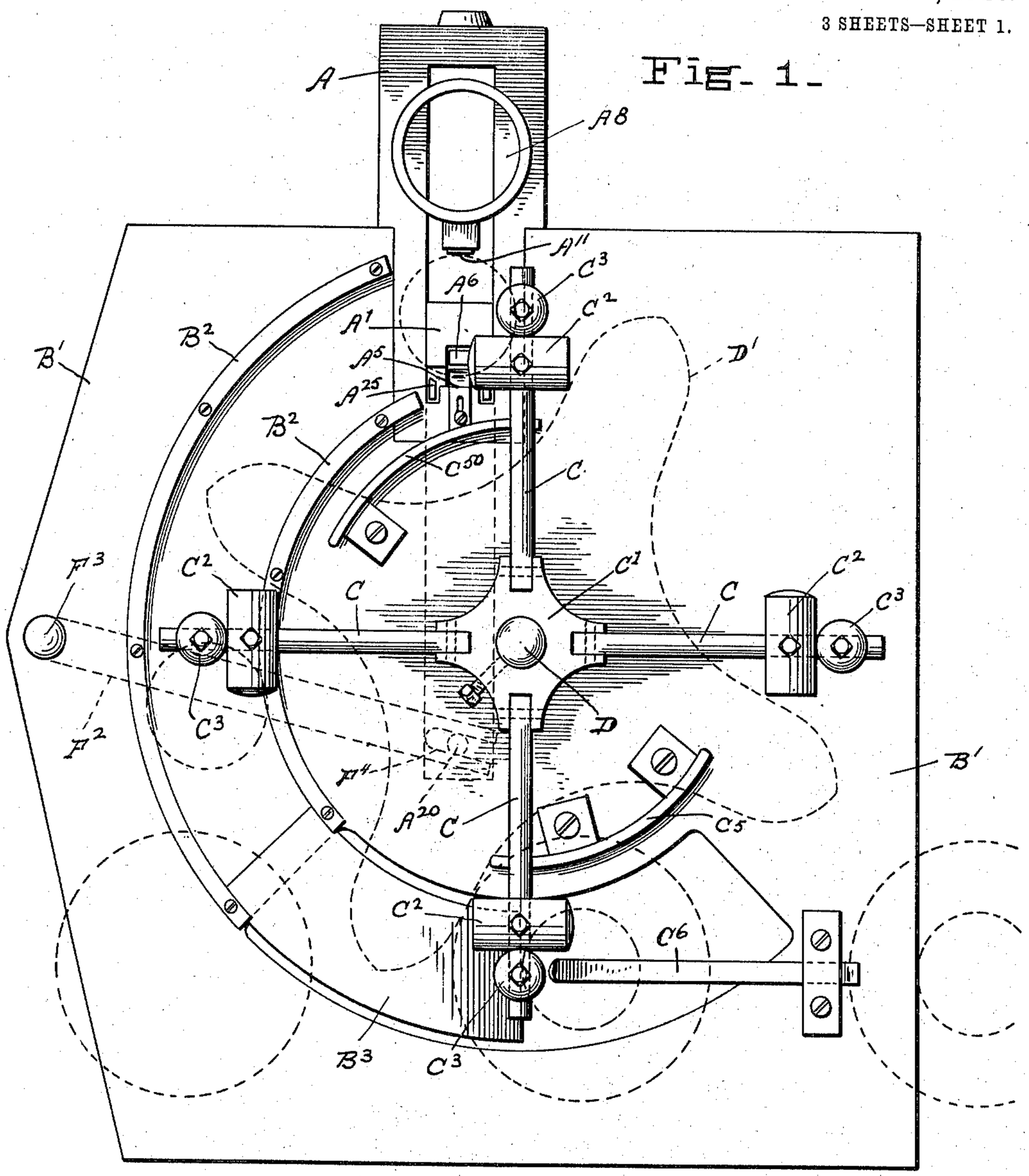
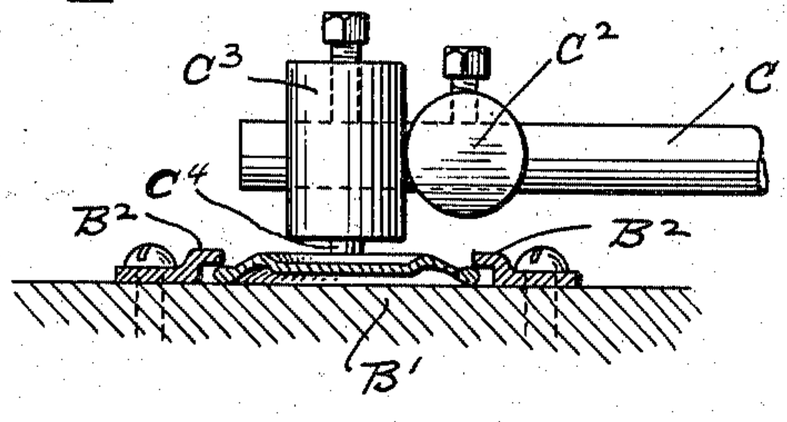


Fig. 2.



WITNESSES

J. Clyde Tipley.

M. Seltzloff

INVENTOR

William G. Palmer

BY

Lyon & Lyon

ATTORNEYS

W. G. PALMER.

CAN CAP PLACING MACHINE.

APPLICATION FILED MAR. 24, 1909.

947,685.

Patented Jan. 25, 1910.

3 SHEETS—SHEET 2.

Fig. 3a.

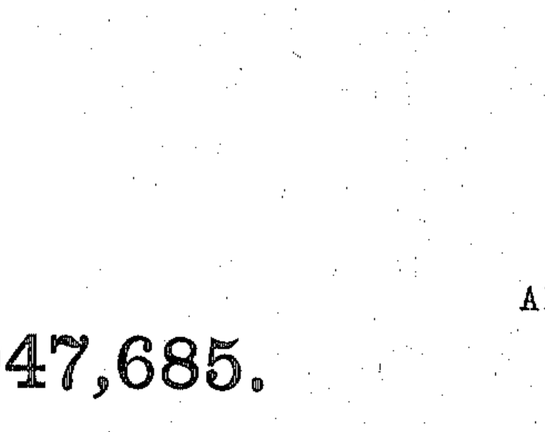


Fig. 4.

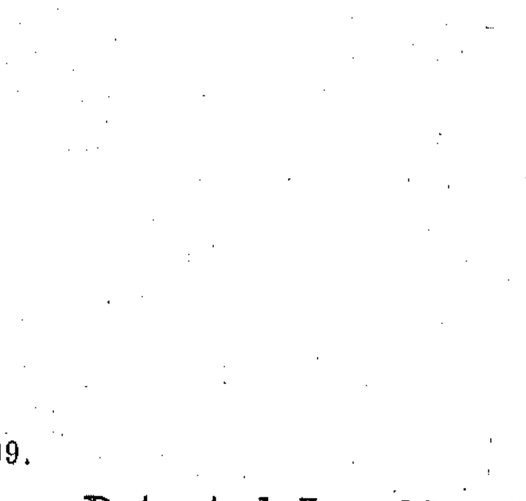
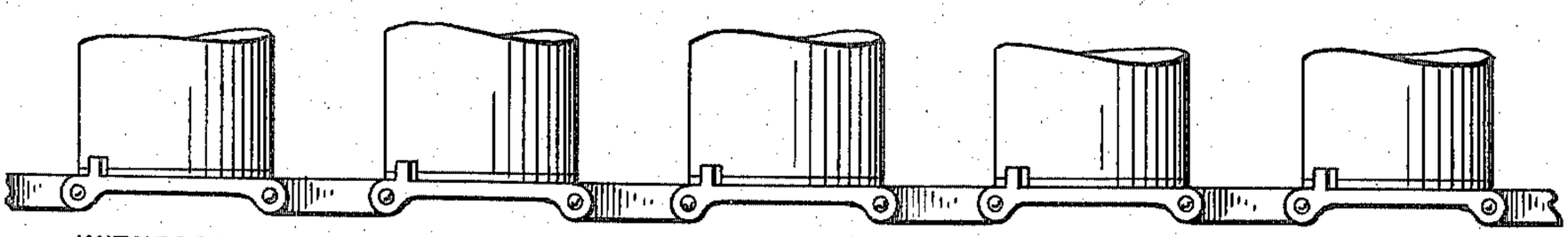


Fig. 3.

Fig. 5.



WITNESSES

J. Clyde Kipley.

M. Fetzloff

INVENTOR

William G. Palmer

BY Lyons & Kissing

ATTORNEYS

W. G. PALMER.

CAN CAP PLACING MACHINE.

APPLICATION FILED MAR. 24, 1909.

947,685. Patented Jan. 25, 1910.

3 SHEETS—SHEET 3.

Fig. 6.

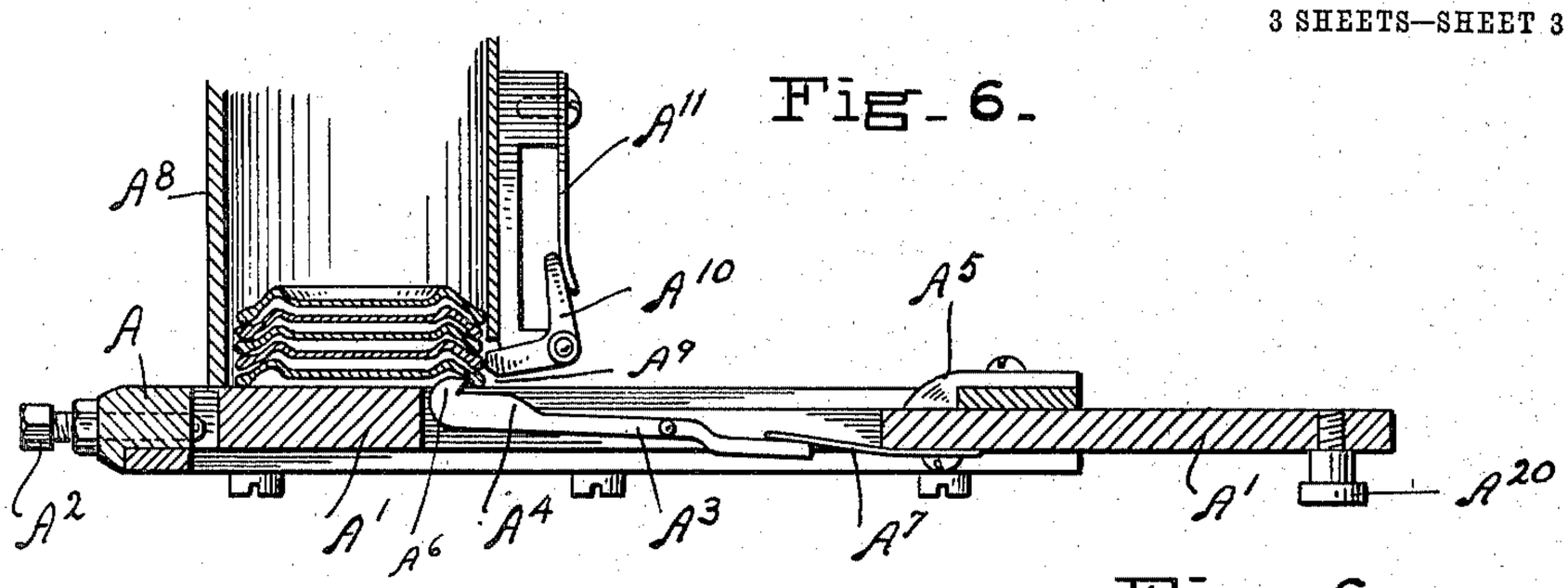


Fig. 6a.

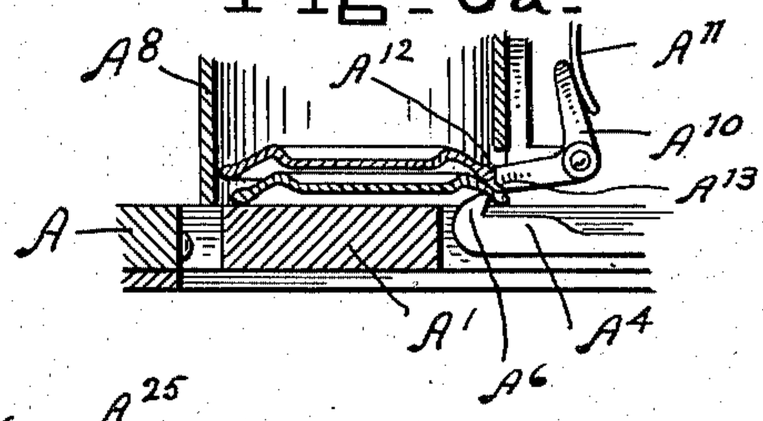


Fig. 7.

Fig. 8.

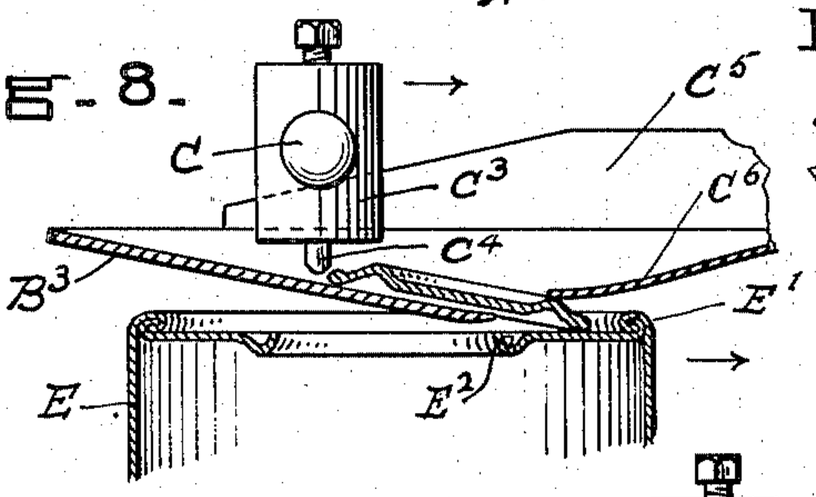


Fig. 3b.

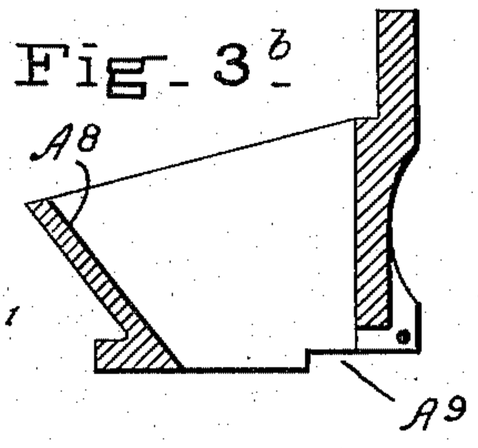


Fig. 9.

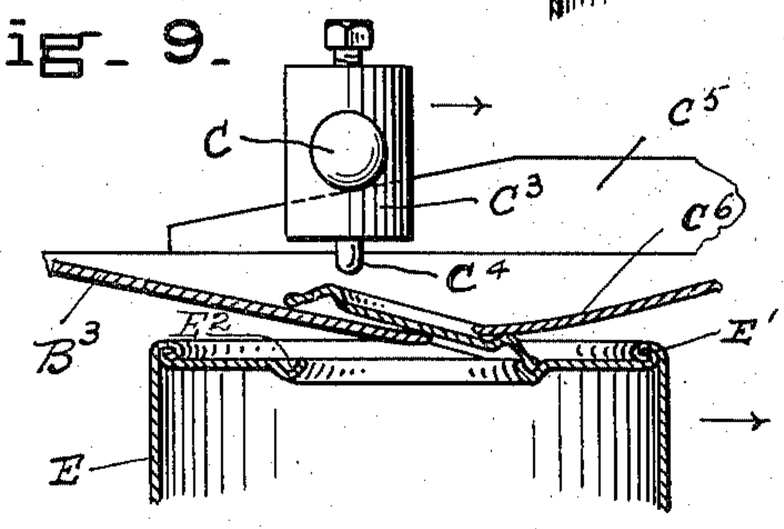
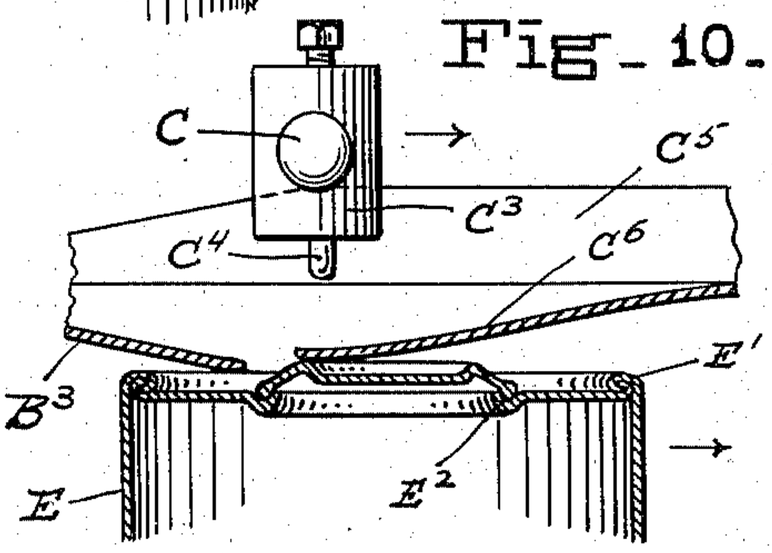


Fig. 10.



WITNESSES

J. Clyde Ripley.

M. Seltzlaff.

INVENTOR

William G. Palmer

BY Lyons & Lyons

ATTORNEYS

UNITED STATES PATENT OFFICE.

WILLIAM G. PALMER, OF HART, MICHIGAN, ASSIGNOR OF ONE-HALF TO WILLIAM R. ROACH, OF HART, MICHIGAN.

CAN-CAP-PLACING MACHINE.

947,685. Specification of Letters Patent. Patented Jan. 25, 1910.

Application filed March 24, 1909. Serial No. 485,546.

To all whom it may concern:

Be it known that I, WILLIAM G. PALMER, a citizen of the United States, residing at Hart, Oceana county, Michigan, have invented a new and useful Improvement in Can-Cap-Placing Machines, of which the following is a specification, reference being had to the annexed drawings.

Can-conveyers in canning factories, at a certain point, carry filled but capless cans. The caps are placed on the cans by hand whereupon the capped cans go to the machines which solder the caps to the cans.

The object of my invention is to devise a piece of apparatus which shall automatically transfer the caps from a cap-magazine and place them in proper position on the cans, thus dispensing with hand labor.

To this end my invention comprises a cap-magazine, a reciprocating ejector for withdrawing the lowermost of a stack of caps from the magazine and sliding it onto a cap-track, a propelling device for moving the caps along the cap-track, and an inclined track-end for guiding the cap upon the top of the can which is being carried along below the track-end by the can-conveyer whereupon, on the forward motion of the can, the can-aperture flange gradually draws the cap into registering engagement therewith.

In the drawings,—Figure 1 is a plan of my apparatus; Fig. 2 is a sectional detail showing an arm carrying a weighted cap-propeller; Fig. 3 is a horizontal plan view, partly in section on a plane taken below the bed plate of Fig. 1; Figs. 3ª and 3ᵇ being details; Fig. 4 is an end elevation of the cap-magazine; Fig. 5 is a detail of the can-conveyer; Figs. 6, 6ª and 7 show longitudinal central sections through the ejector for withdrawing caps from the magazine; and Figs. 8, 9 and 10 show sectional details illustrating the transfer of the caps from the inclined track-end to the aperture.

I shall first describe the ejector mechanism for withdrawing the caps from the cap-magazine. Referring to Figs. 6 and 7, there is a frame A in which the slide A^1 reciprocates, a screw A^2 being provided to adjust the extent of motion. The slide A′ carries a hinged and spring-pressed ejector A^3 supplied with a cam A^4 which cam coöperates with a depressing-stop A^5 for throwing the ejector-point A^6, against the tension of the spring A^7, below the surface of the guiding frame. The ejector-lever A^3 lies in the direction of motion of the slide, in which position it obviously acts more efficiently than if it were mounted at right angles to or across this direction of motion. Stated differently the axis upon which the lever is hinged is at right angles to the direction of reciprocation of the slide. The magazine A^8, which may be made tall enough to hold any convenient number of caps, has a slot A^9 wide enough to permit a single cap to be drawn therethrough. But in order to prevent any jamming of the caps, I mount a hinged stop A^{10} tensioned by the spring A^{11}, upon the cap-magazine and arrange it so as to contact with the edge of the cap above the bottom cap, thus holding it in place while the lowest cap is being withdrawn. A weight-actuated stop might obviously be substituted for the spring-actuated stop A^{10}.

The operation of the cap-ejector will now be clear. When the slide is in the position shown in Fig. 6, the ejector-point takes under the inner edge of the cap, being forced above the general surface of the ejector-frame A by the spring A^7. The slide A′ being moved to the right, the lowest cap of the magazine is drawn through the slot A^9 out upon the surface of the frame A. When the position indicated in Fig. 7 is approached, the depressing-stop A^5, acting against the cam A^4, forces the hinged ejector A^3 down against the tension of the spring A^7 to withdraw the ejector-point A^6 from contact with the cap. The cap thus lies upon the frame A, ready to be moved onto the cap-track by the cap-propelling devices. At the instant the lowest cap is being withdrawn from the cap-magazine, the inclined edge of the lowest cap forces the superposed stack of caps remaining in the magazine up by a small amount. The hinged stop A^{10}, however, keeps contact with the second or superposed cap, rotating a trifle upon its hinge for this purpose. This action is illustrated in Fig. 6ª. The result may be effected by providing the end of the hinged stop A^{10} with a vertical portion A^{12} for engaging with the second cap and with an inclined portion A^{13}. The sliding lowermost cap, by contact with the inclined portion A^{13}, exerts a force which swings the stop A^{10} upwardly upon its hinge and thus permits the vertical portion A^{12} to remain in contact

with the superposed cap in its upward tilting motion. The withdrawal of the bottom cap from the magazine has a tendency to leave the two or three lowest caps remaining in the magazine in a position in which they do not lie accurately superposed. To rectify this, I provide the pair of abutments A^{25} (Figs. 1 and 3^a) upon the slide A′. The motion of the slide toward the magazine causes these abutments A^{25} to strike the lower two caps and force them into a proper relative position of accurate superposition so that the ejector-point A^6 and the hinged stop A^{10} may be better able to perform their functions.

I have now to describe the cap-track and the devices for propelling the cap along the track to the inclined track-end. This cap-track, upon which the caps slide flatwise, is shown in Fig. 1 and is formed by the base plate B^1 to which may be added track-flanges B^2 fastened upon the base plate, which flanges in the preferred form are circular and may overhang the edges of the cap to a trifling extent to steady its motion. At the end of the track, there is secured a track-end B^3 which, as shown in Figs. 8, 9 and 10, is preferably inclined and which may be made of spring metal or hinged. This track-end may be adjusted to just clear the path of the cap-top or to be in actual yielding contact therewith. The caps are propelled along the track by the propelling-arms C, of which four are shown in the present instance, which propelling-arms are hinged to a sleeve C^1, mounted on the power shaft D, a weight C^2 being secured to each hinged arm C to give it a downward bias and a propeller C^3, having a propelling point C^4, being fastened upon the end of the hinged arm C in the manner shown in Fig. 2. Manifestly the point C^4 may be made heavy enough to dispense with the weight C^2. There is a cam-track C^5 which is a device for disengaging the propeller from the cap by raising the propelling-point upward out of contact with the cap at the appropriate time. The track also prevents the propeller from dropping into a slot shown in the bed plate at this point. A similar track C^{50} accomplishes a similar purpose at the opposite side of the machine.

It will be evident that when the ejector has withdrawn a cap from the magazine and has placed it at the entry of the track-flanges B^2, as shown in dotted lines in Fig. 1, the propeller-point C^4 will contact with the back edge of the cap and move it along the track between the cap-track flanges B^2 and toward the inclined track-end B^3.

The action by which the cap takes its place in the can-groove surrounding the can aperture is illustrated in Figs. 8, 9 and 10, to which reference is now made. The power shaft, to which hinged propeller-arms are secured, moves in synchronism or in time with the can-conveyer, by means described later on. The propeller-arms and cans must thus move together. The cap is moved to a point at which its front edge projects slightly beyond the inclined track-end B^3, and into the path of the can-aperture flange E^2. This can aperture flange E^2, it will be understood, is the circular flange which surrounds the central can aperture and which, as cans are now made, is itself surrounded by a groove in which the circular cap-edge fits when the can is capped. The timing of the parts, in case a can having a raised rim E′ is employed, is such that the front edge of the cap first strikes the top of the can E at a point between the raised rim E′ and the can-aperture flange E^2. If no raised rim E′ is used on the can, it will manifestly suffice to have the front edge of the cap get into the path of the can-aperture flange E^2, some time before this has passed. Further motion of the can to the right, in Fig. 8, is preferably unaccompanied by any forward motion of the cap which may be accomplished by placing the cam C^5, so that it now comes in action and raises the propelling point C^4 out of contact with the rear-edge of the cap. It results that forward motion of the can, the cap being stationary or moving more slowly forward than the can, brings the can-aperture flange E^2 in contact with the forward cap-edge. Continued forward motion of the can thereupon draws the cap forward with the can. In fact the cap gradually moves into and registers with the can-groove which defines the can aperture, all sudden or falling motions of the cap being largely avoided. A stationary spring finger C^6 is provided to prevent the cap from accidentally flipping upward. This finger also exercises a downward pressure when the cap, in its inclined position of Fig. 9, is being drawn forward by the can. In this way more effective registration of cap and can is secured. Furthermore if a cap happens to be upside down from false stacking in the magazine, the can-aperture flange will not engage the cap-edge so that the cap will not register with the can-aperture. In this case the spring-finger C^6 may be positioned to dislodge the cap from the can and the operator will be able to see, at a glance, that there is an uncapped can and be able to remove it from the conveyer.

The means for rotating the power shaft D in synchronism or in time with the cap-conveyer consists in a star wheel D′, shown in full lines in Fig. 3 and in dotted lines in Fig. 1. This star wheel is secured to the shaft D and is rotated by the cans on the conveyer. The cans in their forward motion push against the points of the star wheel to rotate the star wheel and the shaft

D to which it is secured in synchronism with the can-conveyer.

There remains to describe the device by which a reciprocating motion is conveyed to the slide A′ of the ejector mechanism. This consists of a four armed cam F, Fig. 2, secured to the power shaft D. The cam-arms operate against a pin F′ mounted upon an arm F^2, which is hinged to the base plate of the machine at F^3, Fig. 1, and which has formed therein a slot F^4, at the end opposite the hinge, coöperating with the pin A^{20} upon the slide A′. A helical spring F^5 is secured to the machine frame and the hinged-arm F^2 to secure the return motion of the slide A′ toward the cap-magazine.

The operation of the slide operating means will now be understood. The rotation of the power shaft D rotates the cam-arms which, acting against the pin F′ turn the hinged-arm F^2 on its hinges downwardly in Fig. 3. The slotted end of the hinged arm F^2 in its downward motion carries with it the pin A^{20} and consequently the slide A′ to which the pin is secured. This shows why the slide A′ is moved downwardly in Fig. 3. The upward motion of the slide is caused by the helical spring.

I claim,—

1. A can-cap placing machine comprising a can-conveyer, an inclined track-end adjacent to the path of the can-top, and a propeller in time with the conveyer for moving the forward cap-edge beyond the track-end and into the path of the passing can-aperture flange, whereby the can-aperture flange gradually draws the cap into registering engagement therewith, substantially as described.

2. A can-cap placing machine comprising a can-conveyer, an inclined track-end adjacent to the path of the can-top, a stationary finger at the track-end, and a propeller in time with the conveyer for moving the forward cap-edge beyond the track-end and into the path of the passing can-aperture flange, whereby the can-aperture flange gradually draws the cap into registering engagement therewith, substantially as described.

3. A can-cap placing machine comprising a can-conveyer, a yielding, inclined track-end adjacent to the path of the can-top, and a propeller in time with the conveyer for moving the forward cap-edge beyond the track-end and into the path of the passing can-aperture flange, whereby the can-aperture flange gradually draws the cap into registering engagement therewith, substantially as described,

4. A can-cap placing machine comprising a can-conveyer, a track-end adjacent to the path of the can-top, a propeller in time with the conveyer for moving the forward cap-edge beyond the track-end and into the path of the passing can-aperture flange, and a device for disengaging the propeller from the cap, whereby the can-aperture flange gradually draws the cap into registering engagement therewith, substantially as described.

5. A can-cap placing machine comprising a can-conveyer, a track-end adjacent to the path of the can-top, an upwardly movable propeller in time with the conveyer for projecting the cap-edge beyond the track-end and into the path of the passing can-aperture flange, and a cam-track for disengaging the propeller from the cap, whereby the can-aperture flange gradually draws the cap into registering engagement therewith, substantially as described.

6. A can-cap placing machine comprising a can-conveyer, a cap-magazine, a cap-ejecting device therefor, a stationary, circular cap-track upon which the caps slide flatwise, and a rotary propeller for sliding the caps from their ejected position in front of the cap-magazine along the circular cap-track and over the can-conveyer, substantially as described.

7. A can-cap placing machine comprising a can-conveyer, a stationary, circular cap-track upon which the caps slide flatwise, a cap-magazine provided with a cap-ejecting device, a rotary, hinged propeller concentric with the circular track for sliding the caps from their ejected position in front of the cap-magazine along the circular cap-track and over the can-conveyer, and a device for disengaging the hinged propeller from the cap, substantially as described.

8. A can-cap placing machine comprising a can-conveyer, a circular cap-track having a track-end, a cap-magazine provided with a cap-ejecting device, a shaft concentric with the track carrying a star wheel for engagement with the cans, and a cap-propeller mounted on the shaft, substantially as described.

9. A can-cap placing machine comprising a can-conveyer, a cap-track having a track-end, a cap-magazine provided with a reciprocating cap-ejecting device, a cap-propeller, a power shaft, a cam mounted thereon, and a hinged arm connected with the reciprocating cap-ejector and operated by the cam, substantially as described.

10. The combination of a can-cap magazine, a reciprocating slide and a spring-pressed ejector-lever having its axis at right angles to the reciprocation of the slide, for contacting with the edge of the can-cap to remove it from the magazine, substantially as described.

11. The combination of a can-cap magazine, a reciprocating slide, a spring-pressed ejector-lever having its axis at right angles to the reciprocation of the slide, and a projecting point on the lever for contacting with the inner edge of the can-cap to with-

draw it from the magazine, substantially as described.

12. The combination of a can-cap magazine, a reciprocating slide, a spring-pressed ejector-lever having its axis at right angles to the reciprocation of the slide, and a depressing stop to withdraw the lever from contact with the cap upon its removal from the magazine, substantially as described.

13. The combination of a can-cap magazine carrying superposed caps, a reciprocating slide carrying an ejector for the bottom cap, and a yielding stop coacting with a superposed cap, substantially as described.

14. The combination of a can-cap magazine carrying superposed caps, a reciprocating slide carrying an ejector for the bottom cap and a yielding stop having a portion coacting with the first superposed cap and an inclined portion coacting with the cap to be withdrawn, substantially as described.

15. The combination of a can-cap magazine carrying superposed caps, a reciprocating slide, a spring-pressed ejector carried thereon for contacting with the inner edge of the can-cap, and an abutment carried upon the slide to force the lower cap or caps into proper position, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM G. PALMER.

Witnesses:
G. R. EASTON,
RUFUS F. SNELL.