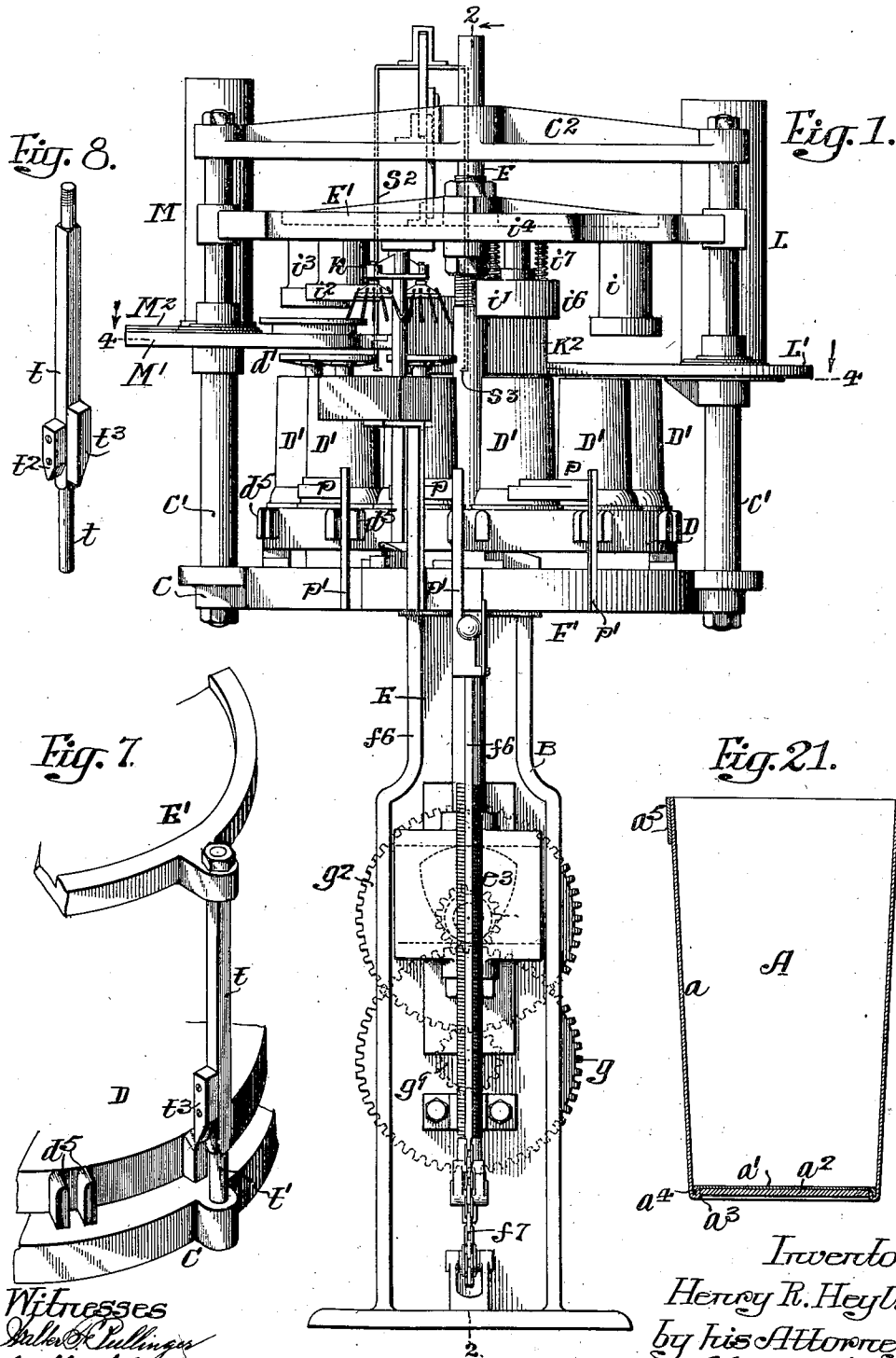


H. R. HEYL.  
MACHINE FOR MAKING PAPER BOTTLES AND LIKE OBJECTS.  
APPLICATION FILED OCT. 9, 1909.

1,018,319.

Patented Feb. 20, 1912.

7 SHEETS—SHEET 1.



Witnesses  
Walter C. Pullinger  
Willa A. Burrows

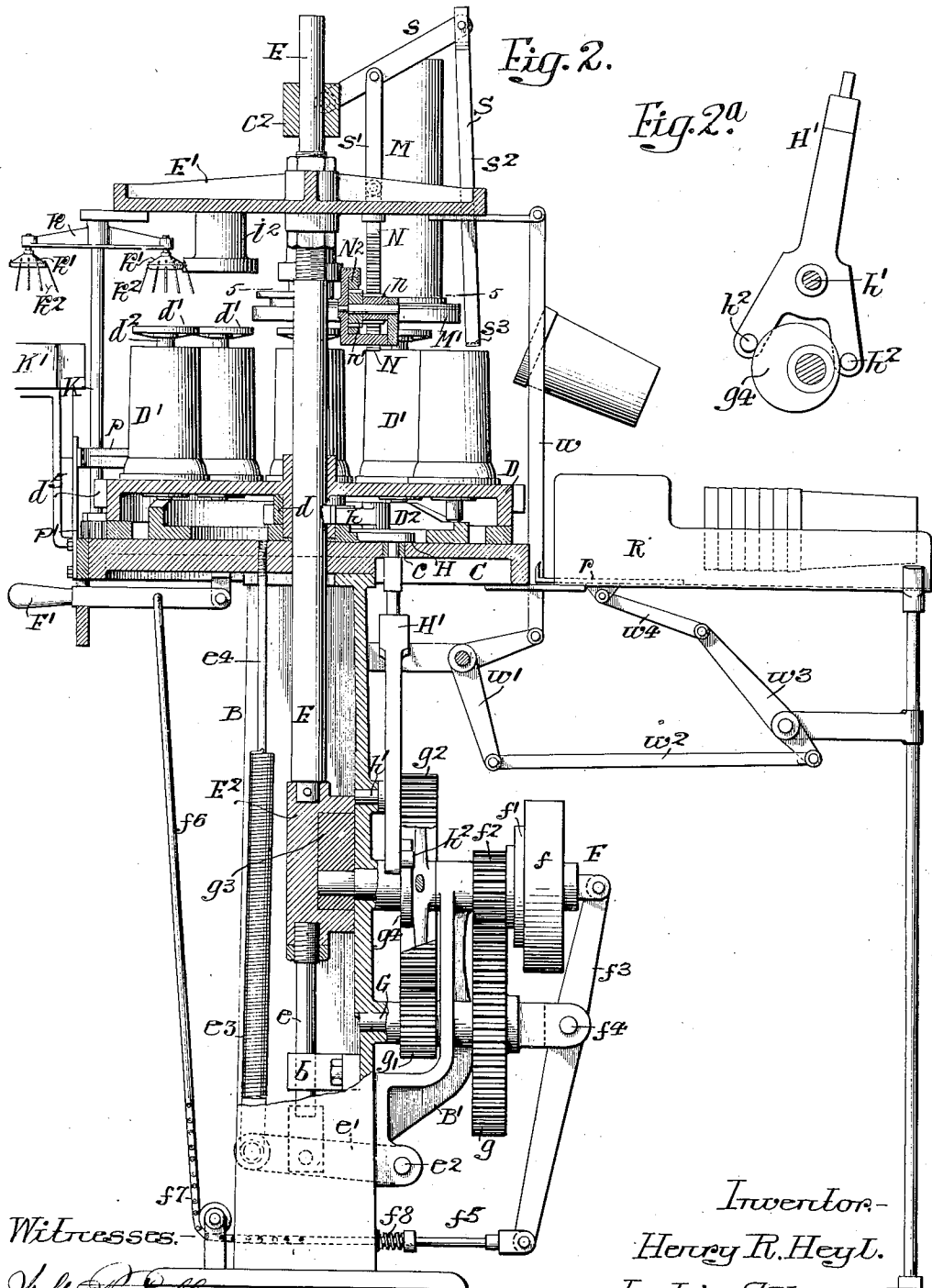
Inventor—  
Henry R. Heyl.  
by his Attorneys:  
Harmon & Harmon

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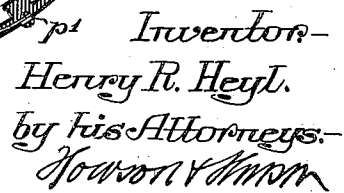
Witnesses:  
Valter A. Pullinger  
Otto A. Burrows

Inventor—  
Henry R. Heyl.  
by his Attorneys—  
H. R. Heyl & Co.

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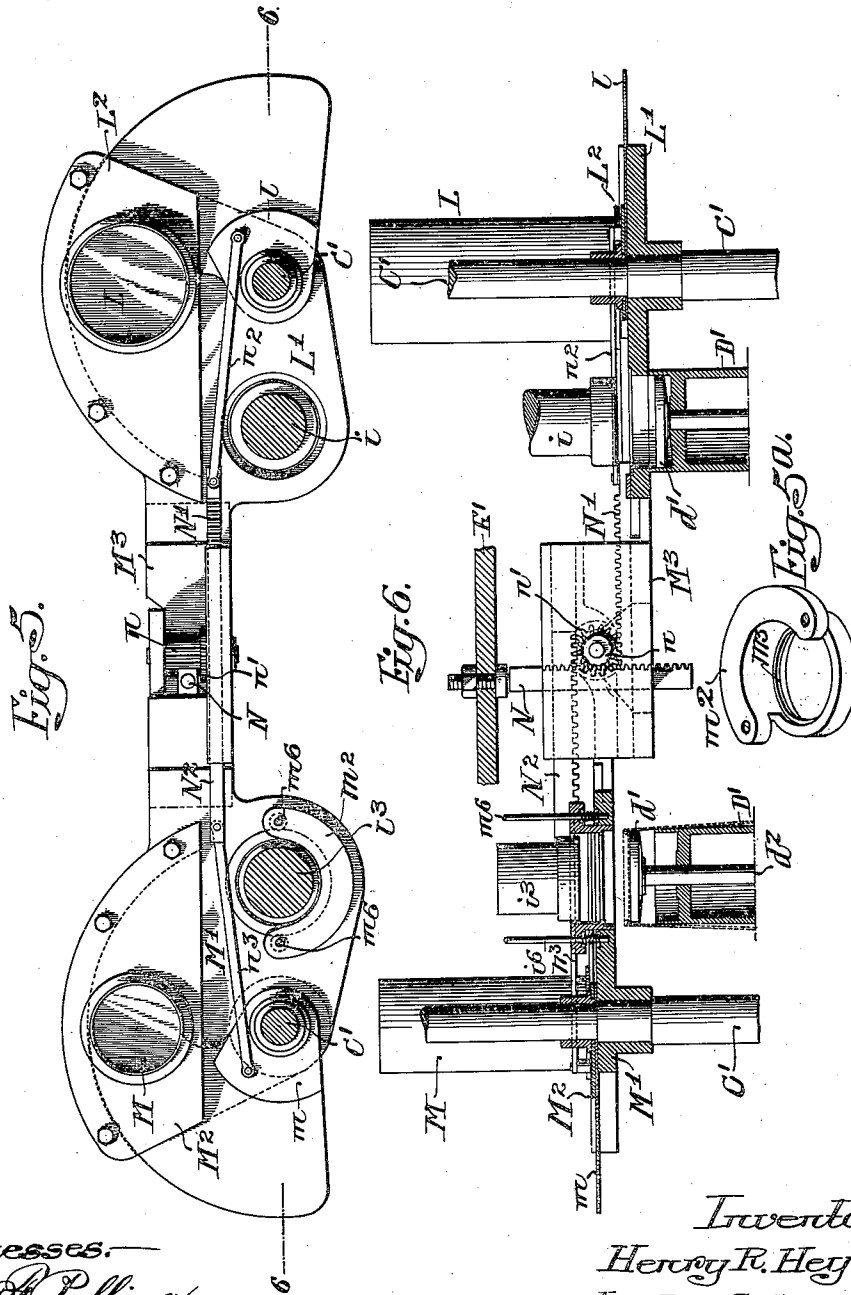


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7 SHEETS—SHEET 4.



Witnesses.—  
Walter Pullinger  
Wille A. Burrowes

Inventor.—  
Henry R. Heyl.  
by his Attorneys.  
Hess & Hannon

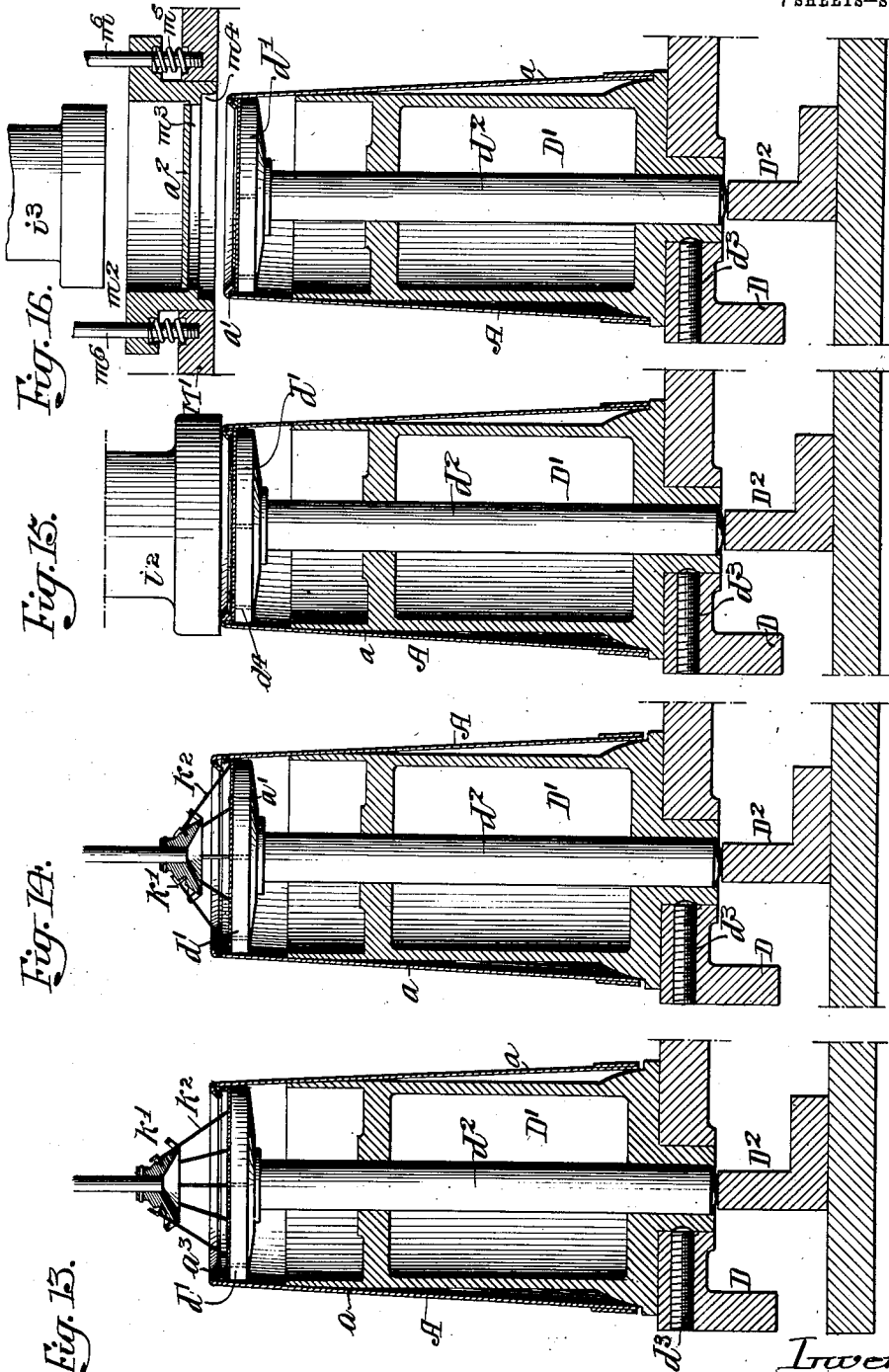


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7 SHEETS—SHEET 6.



Witnesses.  
Willa A. Pullinger  
Willa A. Burrows

Inventor  
Henry R. Heyl.  
by His Attorneys:  
H. M. M. M.

MACHINE FOR MAKING PAPER BOTTLES AND LIKE OBJECTS.

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1,018,319.



Fig. 19.

Fig. 18.

*Fig. 17.*

Witnesses:  
Walker F. Pullinger  
Willie A. Burrows

Inventor:  
Henry R. Heyl.  
by his Attorneys:  
Hornum & Hornum

# UNITED STATES PATENT OFFICE.

HENRY R. HEYL, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE AMERICAN PAPER BOTTLE COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

MACHINE FOR MAKING PAPER BOTTLES AND LIKE OBJECTS.

1,018,319.

Specification of Letters Patent.

Patented Feb. 20, 1912.

Application filed October 9, 1909. Serial No. 521,835.

*To all whom it may concern:*

Be it known that I, HENRY R. HEYL, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Machines for Making Paper Bottles and Like Objects, of which the following is a specification.

The object of this invention is to construct an automatic machine which will properly assemble the different elements of a paper bottle and secure them together.

The invention relates particularly to the manufacture of paper bottles or containers having a body portion with an inturned flange at the bottom, a bottom section having an outturned flange, and a locking disk which holds together the inturned flange of the body and the out-turned flange of the bottom. A bottle of this type is practically waterproof and can be made absolutely waterproof by dipping in paraffin, and can be made either with tapered sides, as shown in the drawings, or with sides of an even diameter throughout. The bottle is preferably made of paper and can be of any thickness and may be of any stock desired.

In the accompanying drawings:—Figure 1, is a view in elevation of my improved paper bottle machine; Fig. 2, is a vertical sectional view on the line 2—2, Fig. 1; Fig. 2<sup>a</sup>, is a detached view of the ratchet actuating lever and cam; Fig. 3, is a plan view; Fig. 3<sup>a</sup>, is a plan view of the paste receptacle; Fig. 3<sup>b</sup>, is a detached sectional view of part of Fig. 3, enlarged; Fig. 4, is a sectional view on the line 4—4, Fig. 1; Fig. 4<sup>a</sup>, is a view of a detail illustrated in Fig. 4; Fig. 5, is an enlarged sectional plan view on the line 5—5, Fig. 2; Fig. 5<sup>a</sup>, is a perspective view of a detail of Fig. 5; Fig. 6, is a sectional view on the line 6—6, Fig. 5; Figs. 7 and 8, are detail perspective views illustrating the locking mechanism for holding the carrying disk in position; Figs. 9 to 20, are diagram views showing different steps during the operation of the machine in the manufacture of a paper bottle; and Fig. 21, is a sectional view of a paper bottle made by my improved machine.

I will first describe a paper bottle which is assembled and made on the machine.

Referring first to Fig. 21, A is the bottle having a tapered body portion *a* of paper of any thickness desired, a bottom section *a'*

and a disk *a*<sup>2</sup>. The lower end of the body portion has an in-turned flange *a*<sup>3</sup> forming an annular recess into which extends the out-turned flange *a*<sup>4</sup> of the bottom *a'*. After a suitable cement is introduced around the edge of the bottom the disk *a*<sup>2</sup> is forced into position, locking the two flanges together; the cement entering the space between the two flanges fastens the two flanges together, as well as secures the disk to the bottom. Preferably at the mouth of the bottle is a reinforcing band *a*<sup>5</sup>. The bottle can be of any length or any diameter desired and can be closed by any suitable lid, and is especially useful in the packing and transportation of milk or other fluids liable to deterioration. The smaller sizes can be used as tumblers.

The bottle described above is preferably dipped in paraffin so as to make it waterproof, and when the cap is applied it will be air tight. The bottle is of sufficient strength that it can be readily transported and after it is used once it can be discarded, as it can be made at a very low cost.

Referring now to the drawings of the machine, B is a standard on which is mounted the base C, above the base is a carrier D on which the several forms D' are mounted.

C', C' are posts secured to the base C and connected to the posts at their upper ends is a cross frame C<sup>2</sup>.

E is a vertical rod extending up through the base and guided by the cross frame C<sup>2</sup> and vertically adjustable on this rod is the head E'. This head has a vertical movement to and from the carrier D.

F is a driving shaft having a belt pulley *f* and provided with a clutch *f'*, the other element of the clutch being attached to the pinion *f*<sup>2</sup> loose on the shaft, and this pinion meshes with a gear wheel *g* on a shaft G mounted in bearings in the frame and in the bracket B', which latter also has bearings for the driving shaft F. On the hub of the gear wheel *g* is a pinion *g'* which meshes with a gear wheel *g*<sup>2</sup> secured to the shaft F and on the end of the shaft is a cam *g*<sup>3</sup> which engages a cross head E<sup>2</sup> secured to the end of the rod E. Projecting from the lower end of the cross head is a guide rod *e* adapted to a bearing *b* on the standard B and the end of this rod is secured to a lever *e'* pivoted at *e*<sup>2</sup> to the standard, and attached

to the outer end of this lever is a spring  $e^3$  connected to a rod  $e^4$  secured to the underside of the base plate C. The movements of the cross head, both up and down, are controlled by the cam, the spring acting as a counterbalance to overcome the weight of the parts carried by the rod E.

The carrier D is intermittently rotated so as to bring the forms D' one after another in line with the plungers on the head E'. On the hub of the carrier D is a ratchet wheel  $d$ , as shown by dotted lines in Fig. 4, and on a lever H, loosely mounted on the hub of the carrier, is a spring controlled pawl  $h$  which engages the teeth of the ratchet wheel  $d$ .

H' is a lever pivoted at  $h'$  to a standard B and the long arm of this lever extends through a curved slot  $c$  in the base plate C and enters an orifice in the lever H. The other arm of the lever is forked (Fig. 2<sup>a</sup>) and on each arm of the fork is a pin  $h^2$  which extends on each side of the cam  $g^1$  on the hub of the gear wheel  $g^2$ , so that a vibrating motion is imparted to the lever H' as well as the pawl carrying lever H, and the motion is sufficient to allow the pawl to move the carrier forward a given distance and return, springing back of another tooth, thus feeding the carrier forward intermittently.

The clutch mechanism is controlled in the present instance by a lever  $f^2$  pivoted at  $f^4$  and connected to a rod  $f^5$  which is attached to a rod  $f^6$  through a chain  $f^7$ . This rod is attached to a lever F' within easy reach of the operator, so that when it is desired to stop the machine all that is necessary is to release the lever from its notch and the spring  $f^8$  will force the lever  $f^3$  in a direction to release the clutch and stop the machine. Other clutch mechanism, or a belt shifter, may be used without departing from the essential features of the invention.

Within each hollow form D' is a disk  $d'$  mounted on a spindle  $d^2$  which extends through bearings in the form D', as clearly illustrated in Fig. 9. The forms are detachable and each form has a hub extending into a cavity in the carrier D and is held in place by a set screw  $d^3$ . It will be noticed, by referring to the drawings, that the disks  $d'$  have one or more holes  $d^4$  extending through them, acting as air vents so as to prevent the trapping of air under the plunger when the parts of the bottle are being assembled on the form. The end of each plunger spindle  $d^2$  rests on a cam D<sup>2</sup> secured to the upper surface of the base plate C; the cam being suitably inclined so as to move the plunger vertically at given points in the rotation of the carrier. The spindles in the present instance are held down onto the cam by their own weight, although springs may be used, if desired.

Secured to the underside of the head E' is a series of plungers  $i$ ,  $i'$ ,  $i^2$  and  $i^3$ , and on a vertical shaft K also secured to the head E' is a pasting attachment by which paste is applied to the bottle at the proper point. Secured to the shaft is a hub having two arms  $k$  carrying heads  $k'$  to which are pivoted fingers  $k^2$ , the fingers being loosely mounted so that when they strike the bottom of the bottle they are spread out, carrying the paste to the corner formed by the bottom and its flange.

K' is a paste receptacle secured to a standard mounted on the base plate C. When the fingers of one arm are above a bottle the fingers of the other arm are above the paste receptacle. When the paste fingers move vertically with the head E' to which they are attached through the shaft K they are forced onto the ring K<sup>3</sup> in the paste receptacle and the other set of fingers are forced onto the bottom of the bottle. When the fingers are raised clear of the paste pot and bottle the shaft is given a half turn to bring the fingers that were above the paste pot into position above the bottle, while the other fingers are moved into position to have paste applied to them.

Motion is imparted to the shaft K in the present instance by a rack  $k^4$  which meshes with a pinion  $k^5$  on the shaft K, and this rack is connected to a projection on the lever H so that the parts are so operated that the shaft will be given a complete half turn as each bottle is moved in position, pawls  $k^6$  allowing the pinion to return without turning the shaft (Fig. 3<sup>b</sup>).

The blanks for the bottoms  $a'$  and the locking disks  $a^2$  are placed in hoppers and are fed automatically.

L is the bottom blank hopper and M is the locking disk hopper.

L' is a plate secured to one of the posts C' and is in the form of a segment as illustrated in Fig. 3. Mounted on the plate L' is a plate L<sup>2</sup> which carries the hopper L and between the two plates is a selector  $l$  pivotally mounted on the post C'. This selector is recessed at one edge to receive the bottom blank as it falls into the space between the plates L' and L<sup>2</sup> and carries it forward as it reciprocates to a position directly under the plunger  $i$ , so that it will be driven down into the form which is located at that time under the plunger. The bottom is flat and without a flange as it leaves the hopper and as it is forced through the opening in the plate L' it is flanged, as illustrated in Fig. 10, and is driven into the end of a form D'.

M' is a plate mounted on a post C' opposite the post carrying the plate L' and on this plate M' is a second plate M<sup>2</sup> on which is mounted the hopper M for the locking disks  $a^2$ . A selector  $m$  pivoted to the post C' is

arranged to travel between the two plates  $M'$  and  $M^2$  and select a disk from the hopper and carrying it over in position below the plunger  $i^3$ . The two selectors  $l$  and  $m$  are operated on the vertical movement of the head  $E'$ .

Depending from the head  $E'$  is a rack  $N$  which meshes with the teeth of a pinion  $n$  mounted in bearings on a bridge piece  $M^3$  secured to the two plates  $L'$  and  $M'$ , as clearly shown in Figs. 5 and 6. On the hub of the pinion  $n$  is a second pinion  $n'$  with which meshes the two racks  $N'$  and  $N^2$ . The rack  $N'$  is connected by a rod  $n^2$  to the selector  $l$  and the rack  $N^2$  is connected by a rod  $n^3$  to the selector  $m$  so that as the rack  $N$  is raised and lowered with the head  $E'$  it rotates the pinions first in one direction and then in the opposite direction, causing the selectors to move from their hoppers to the plungers.

In order to keep the body portions onto the forms, I provide springs  $p$  secured to posts  $p'$  carried by the base plate  $C$ . These springs are three in number and are only necessary when the forms are in line with the plungers  $i'$  and  $i^2$  and the paster. The springs are split, as shown in Figs. 2 and 3, so that a portion of the spring will bear upon the reinforcing rim  $a^5$ , while the other portion of the spring will bear upon the body portion of the rim.

The plunger  $i$  acts in conjunction with the perforated plate  $L'$  to form the flange on the bottom  $a'$  of the bottle. The plunger is preferably enlarged, as shown in Fig. 9, and is adapted to an opening in the plate  $L'$ ; the plate being recessed for the reception of the flat disk, so that when the plunger descends it forces this disk through the opening and flanges it, and carries it into the upper end of the form  $D'$ , as illustrated in Fig. 10. The body portions  $a$  are placed on the forms  $D'$  by hand; the head  $E'$  being recessed at  $e^5$  to allow the body portion to be placed in position. The bottom end of the body portion is partly broken down prior to being inserted in the machine, as shown in Fig. 11, so that it can be readily flanged.

The plunger  $i'$  consists of a stem  $i^4$ , a disk  $i^5$  and a yielding flanged head  $i^6$ , Fig. 12. Springs  $i^7$  on posts carried by the head tend to hold the head onto the disk  $i^5$ ; the lower flange of the head  $i^6$  is rounded and has a slight shoulder  $i^8$ , so that when the head  $E'$  is depressed both the disk  $i^5$  and head  $i^6$  come in contact with the end of the body portion  $a$  and the flange of the head holds the body portion as the disk forces the crimped portion of the body downward, at the same time the cam  $D^2$  raises the disk  $d'$  which carries the bottom  $a'$  and the flange  $a^4$  of the bottom is forced into the annular groove formed by the flange of the body

portion, as shown in Fig. 12<sup>a</sup>, this movement causes the body portion to be raised from the form  $D'$ , as shown in Fig. 13, and then the form is moved to a position under the paster, the flange  $a^3$  of the body springing out as shown. The paste is applied by the fingers  $k^2$ , the fingers striking the bottom  $a'$  some distance from the edge, as illustrated in Fig. 13, and as the head  $E'$  is depressed these fingers spread out, as in Fig. 14, under the inturned flange  $a^2$  of the body portion  $a$  and against the flange of the bottom  $a'$ , and when the head  $E'$  is raised the fingers are retracted and raised clear of the moving parts. When the form  $D'$  with the pasted parts aline with the plunger  $i^2$ , which is greater in diameter than the bottom of the bottle, it presses the body portion down against the flange  $a^4$  of the bottom, insuring a neat fit, Fig. 15. The form is then moved in position, as illustrated in Fig. 16, directly below the opening in the plate  $M'$ , and mounted on this plate is a ring  $m^2$  which has an inner flange  $m^3$  arranged to support the locking disk  $a^2$ . The ring is recessed at  $m^4$  under the flange, so as to receive the end of the body portion and prevent it yielding against pressure when the disk is forced into the cavity in the bottom of the bottle by the plunger  $i^3$ , which passes through the ring carrying with it the disk  $a^3$ . It will be noticed that the disk is a trifle larger than the opening at the flange  $m^3$ , so that the disk rests on the flange until forced through the ring by the plunger. The ring is yieldingly supported, being carried by springs  $m^5$  on posts  $m^6$ , so that during the first movement of the plunger  $i^3$  it compresses the springs and forces the ring down onto the end of the body portion, as shown in Fig. 17, then on its continued movement, while the ring holds the body portion in position, it drives the disk into the cavity of the body portion, as shown in Fig. 18. This forcing of the disk into the recess in the bottom of the bottle tends to bind the flange of the body to the flange of the bottom, and the paste previously applied retains the disk in position and also tends to fasten the in-turned flange of the body against the flange of the bottom.

After the disk is applied the carrier is moved and when it is at the discharge point it is in position so that a discharge device  $S$  will remove the finished bottle from the form, as in Figs. 19 and 20; the recessing of the head  $E$  at  $e^6$  allowing for the free discharge of the bottle. In the present instance the discharge device consists of a lever  $s$  pivoted to the cross bar  $C^2$ , Fig. 2; the lever is connected by a link  $s'$  to the movable head  $E'$  and secured to the outer end of the lever is an arm  $s^2$  forked, as shown, so as to span the bottle, and at the end of each fork is a hook  $s^3$ , which engages the lower end of the

bottle and on the upward movement of the head E' this discharge device lifts the bottle off of the form, discharging it into a suitable receptacle. The discharged bottle drops onto  
 5 a tray R shaped to conform to the bottles, and a hooked slide  $r$  engages the bottle and forces it forward, bottom end first, into a previously made bottle, thus nesting the bottles, as shown in Fig. 2. The slide  $r$  is  
 10 actuated on the movement of the head E', being connected to it by a rod  $w$ , bell crank lever  $w'$ , rod  $w^2$ , lever  $w^3$  and link  $w^4$ , but other means of operating the nesting mechanism may be used if found desirable.

15 When the carrier is moved from one position to another by the ratchet mechanism, the forms must be brought into perfect alinement with the plungers, so that on the depression of the head E' the plunger will  
 20 properly engage the bottles, and to bring these elements into proper alinement I attach to the head E' a bar  $t$ ; the body portion of this bar is preferably square, but the lower portion is round, as at  $t'$ , to fit a hole  
 25 in the base plate C, so that the rod is guided by the head and base plate. On the rod is a lug  $t^2$  tapered at its lower end, and on the carrier D is a series of projections D<sup>5</sup>. The lug  $t^2$ , as it descends, fits between two of  
 30 these projections and brings the parts into alinement. The projections are preferably rounded at the top, as shown in Fig. 7, so that the lug will more readily enter the space.

35 In order to prevent the carrier moving past the rod  $t$ , I use a detent pawl V pivoted to the base C; the pivot pin  $v'$  passing through a slot in the pawl V, as shown. The pawl is pressed toward the carrier by  
 40 a spring  $v$  mounted on the pivot pin  $v'$ . This construction allows the pawl to yield to a limited extent, but the spring returns the pawl to its normal position. Pivoted at  
 45  $v^2$  to the end of the detent pawl V is a dog  $v^3$  and one arm of this dog, when in the position illustrated in Fig. 4, tends to hold the pawl V clear of the projections  $d^5$  on the carrier, so that it can partly move, but when  
 50 the dog is in the position shown in Fig. 4<sup>a</sup>, it releases the pawl V, allowing it to move into the path of the projections  $v^5$ , thus preventing the carrier moving beyond the given point, so that when the lug of the bar  $t$  enters the space between the two projections  
 55 it can readily center the carrier.

When the head is raised and the carrier is released, the projections  $d^5$  are moved forward with the carrier and they strike the dog  $v^3$ , tripping the pawl V and allowing  
 60 it to move against the ends of the projections, when the projections pass the end of the arm, the arm moves into the path of the projections.

In order to automatically push the arms  
 65 out of the path I provide the rod  $t$  with a

beveled lug  $t^3$ , which strikes the beveled portion  $v^4$  of the dog, moving it from the position illustrated in Fig. 4<sup>a</sup> to the position illustrated in Fig. 4, and this movement of the dog forces the arm out of the path of  
 70 the projection  $v^5$ .

The operation of the machine is as follows:—The disks from which the bottoms are formed are placed in the hopper L and the locking disks are placed in the hopper  
 75 M. The operator sits in front of the machine and places the body portions on the forms at the point  $e^5$ . When the machine is set in motion the lowermost disk is removed from the hopper, placed in position above a  
 80 form and directly under the plunger  $i$ . On the downward movement of the head E' the plunger drives the disk through the opening in the plate L' and into the end of the form D', the disk being flanged as it is forced  
 85 into position, as shown in Fig. 10. The form is then moved into position to have the body portion applied, as in Fig. 11, then the form is again moved so as to allow the plungers  $i'$  to break down the flange of the  
 90 body portion, as in Fig. 12, then it is moved to the position to have the paste applied, Fig. 13, then paste is applied, as shown in Fig. 14 by the mechanism illustrated, or by any other suitable mechanism, then the form  
 95 is moved to a position under the plunger  $i^2$  and the body portion is forced down upon the flanged bottom, then it is moved again to a position to receive the locking disk  $a^2$ ; the lower disk being removed from the hopper  
 100 and placed in position directly above the form within the ring  $m^2$ , then on the depression of the plunger  $i^2$  the ring will be forced down so as to rest upon the end of the body portion, as in Fig. 17, after which the disk  
 105 is driven into the cavity in the bottom of the bottle, as shown in Fig. 18. The form is then moved to the position at which the bottle is discharged and the hooked members of the arms  $s^2$  engage the bottle at the  
 110 lower end, as shown in Fig. 19, and on an upward movement, as shown in Fig. 20, remove it from the form and after being removed it is discharged into any suitable receptacle.

I claim:—

1. The combination in a machine for forming paper bottles and like articles, of a carrier, a series of forms mounted on the carrier to receive the body portion of the  
 120 bottle, two hoppers, one hopper adapted to receive the bottom disks and the other adapted to receive the locking disks, means for removing a disk from the bottom of the hopper and placing it in position above  
 125 one of the forms, means for removing a locking disk from its hopper and placing it above one of the forms, a series of plungers, means for moving said plungers toward the forms so that the bottom disk will first be  
 130

put in position in the form, then the body portion will be placed on the form by hand, and the plungers will then flange the body portion over the flange of the bottom, and finally force a locking disk into the cavity in the body of the bottle, locking the bottom to the body portion.

2. The combination in a machine for manufacturing paper bottles and like articles, of a base, a carrier mounted on the base, a cam on the base, forms mounted on the carrier, disks within the forms controlled by the cam on the base, a movable head, plungers carried by the head, means for intermittently rotating the carrier so as to bring the forms one after the other in line with the several plungers, means for feeding a bottom disk in position to be flanged and forced into the upper end of a form, the plungers being shaped to turn down the end of the body portion over the flange of the bottom, said body portion being placed on the forms by hand, with means for feeding a locking disk, forcing it into the cavity in the bottom of the bottle, and locking the flange of the body portion to the flange of the bottom.

3. The combination in a machine for making paper bottles and like articles, of a base plate, a carrier mounted on the base plate, means for intermittently rotating said carrier, a series of forms secured to the carrier and adapted to receive the body portion of the paper bottle, a disk mounted within each form, a fixed cam on the base plate upon which the disks rotate, a head, plungers carried by said head and adapted to register with the forms, means for reciprocating said head, a hopper for the bottom disks, a hopper for the locking disks, means for removing the disks from the hoppers and placing them in position between certain of the plungers and the forms, and a device for applying paste to the bottom disk after it is in position.

4. The combination of a base, a carrier mounted on the base, means for intermittently rotating said carrier, forms mounted on the carrier, a disk mounted in each form, a cam on the base controlling the movement of the disk, a head, plungers secured to the underside of the head adapted to aline with the forms, means for reciprocating the head, a hopper for the bottom disks, a selector adapted to remove one of the disks from the hopper and place it in position above a form, and means for operating said selector on the movement of the head.

5. The combination in a machine for manufacturing paper bottles and like articles, of a base, a carrier mounted on the base, means for intermittently rotating said carrier, a series of forms secured to the carrier to receive the body portion of the bottle, a disk mounted in each form having a

spindle, a fixed cam on the base upon which the spindles of the disks ride, a head, plungers secured to the underside of the head adapted to aline with the forms, means for reciprocating the head, a hopper for the bottom disks and a hopper for the locking disks, pivoted selectors adapted to remove the disks from the hoppers and place them in position above the forms, and means for actuating said selectors from the reciprocating head.

6. The combination of a base, a carrier mounted on the base, means for intermittently rotating said carrier, a series of forms mounted on the carrier, a disk mounted in each form, a cam controlling the disks, a head, plungers secured to the underside of the disks and arranged to aline with the forms, a hopper, a selector for the hopper arranged to carry a disk from the hopper to a point above a form, a rack on the head, a pinion and a rack connected to the selector and having teeth meshing with the pinion, and means for reciprocating the head.

7. The combination of a base, a carrier, forms mounted on the carrier, a disk in each form, a cam controlling the disks, a head, means for reciprocating the head, plungers secured to the underside of the head and arranged to aline with the forms, two hoppers, one for the bottom disks and the other for the locking disks, pivoted selectors arranged to travel under each hopper and to remove a disk from the hopper, a rack secured to the head, a pinion mounted in fixed bearings with which said rack engages, a second pinion connected to the first mentioned pinion, two racks having teeth meshing with the said second pinion, and rods connecting the racks with their respective selectors, so that as the head reciprocates the selectors will move to and from the hoppers.

8. The combination in a machine for making paper bottles and like articles, of a base, a carrier mounted on the base, forms mounted on the carrier, disks within the forms, a cam controlling the position of the disks, means for rotating the carrier, a head, means for reciprocating the head, plungers secured to the underside of the head, two hoppers, one for the bottom disks and the other for the locking disks, a selector mounted under each hopper, means for actuating the selectors as the head is reciprocated, a pasting device movable vertically with the head, said device having two arms, pivoted fingers carried by each arm, and a paste pot, the parts being so arranged that when the head is reciprocated one set of fingers will receive paste from the paste pot and the other set will apply paste to the bottom of the bottle and move toward the bottom flange of the bottle, with means for

shifting the arms from a position over the paste pot to a position over one of the forms.

9. The combination in a machine for making paper bottles and the like, of a base, a carrier mounted on the base, forms mounted on the carrier, means for intermittently rotating the carrier, a disk mounted in each form, a cam controlling the position of the disks within the forms, a vertically movable head, means for reciprocating said head, plungers depending from the head and arranged to aline with the forms, hoppers, selectors for removing disks from the hoppers and placing them in position above the forms, and a discharging means for lifting the finished bottle from a form, said discharging means being actuated on the movement of the head.

10. The combination in a machine for manufacturing paper bottles and like articles, of a base, a carrier mounted on the base, forms on the carrier, means for intermittently rotating the carrier, a head, plungers on the head, and a bar carried by the head and having a lug adapted to lock the carrier between its movements, so as to insure the proper position of the forms under the plungers.

11. The combination in a machine for making paper bottles and like articles, of a base, a carrier mounted on the base, forms mounted on the carrier, means for intermittently rotating the carrier, a head, plungers on the head, means for reciprocating the head, projections on the periphery of the carrier, a bar secured to the head and having a lug beveled at its underside and adapted to pass between two of the projections on the carrier, so as to center the forms under the plungers.

12. The combination in a machine for manufacturing paper bottles and like articles, of a base, a carrier mounted on the base, forms on the carrier, a reciprocating head, plungers on the head with which the forms aline, projections on the periphery of the carrier, a rod secured to the head and having a lug arranged to enter the space between two projections so as to bring the forms in exact alinement with the plungers, a detent pawl pivoted to the frame and acting to prevent the carrier moving past a given point, and a pivoted dog on the detent pawl actuated by the carrier as it is moved from the position of rest so as to move the pawl out of the path of the carrier.

13. The combination in a machine for manufacturing paper bottles and like articles, of a base, a carrier mounted on the base, forms on the carrier, a reciprocating head, plungers on the head with which the forms aline, projections on the periphery of the carrier, a rod secured to the head and having a lug arranged to enter the space be-

tween two projections so as to bring the forms in exact alinement with the plungers, a slotted detent pawl, a pivot pin on the frame passing through the slot, a spring on the said pivot pin bearing against the pawl, a pivoted dog on the detent pawl actuated by the carrier as it is moved from the position of rest so as to move the pawl out of the path of the carrier, the spring cushioning the pawl when the carrier strikes it.

14. The combination in a machine for manufacturing paper bottles and like articles, of a standard, a base supported on the standard, a vertical rod extending through the base, a carrier mounted on the rod, forms on the carrier, disks mounted within the forms, a cam secured to the base controlling the position of the disks, a ratchet wheel on the carrier, a pivoted lever, a pawl mounted on the lever and engaging the ratchet wheel, a driving element, a cam on the driving element, a lever connected to the pawl lever and actuated by the cam, a head carried by the rod, plungers on the head, and a cam on the driving element for reciprocating the rod and its head.

15. The combination in a machine for manufacturing paper bottles and like articles, of a form upon which the body of the bottle is mounted, a movable disk within the form, a plate mounted above the form and having a perforation therein, a hopper for the flat blank to form the bottom of the bottle, a selector for removing the blank from the hopper to a point directly above the perforation in the plate and a plunger less in diameter than the perforation, and means for forcing the plunger through the plate with the blank causing the blank to be flanged in its passage and carrying said blank into the end of the form.

16. The combination in a machine for manufacturing paper bottles and like articles, of a form adapted to receive the body portion of the bottle, a disk within the form and carrying the bottom disk of the bottle, a plunger for breaking down the end of the body portion to form a flange, a yielding head having a flange extending over the end of the body portion so as to hold it in position, a plunger for completing the flanging of the body portion, and means for raising the disk carrying the bottom so as to force its flange into the annular groove back of the flange of the body portion.

17. The combination of a form upon which the body portion of a paper bottle is mounted, a disk within the form, means for moving the said disk, means for inserting a flanged bottom into the end of the form, means for turning down the end of the body portion and flanging it over the flange of the bottom, means for applying paste to the bottom, a perforated plate having a yielding segment mounted thereon, said

segment having an in-turned flange to support the locking disk, the segment being shaped to extend around the end of the body portion, and a plunger for driving the locking disk into the cavity in the bottom of the bottle.

18. The combination in a machine for manufacturing paper bottles and like articles, of a carrier, means for intermittently moving the carrier, forms on the carrier, plungers acting in conjunction with the forms to assemble the bottle, means for discharging the bottle from the forms, a trough into which the completed bottles fall, a hooked slide, means connecting the slide with the moving parts of the machine so that when the completed bottle falls into the trough it is forced by the hooked slide into a previously formed bottle.

19. The combination in a machine for manufacturing paper bottles and like articles, of a carrier, means for intermittently moving the carrier, forms on the carrier, a disk mounted in each form, a cam for raising and lowering the disks, a head, a series of plungers on the head, means for applying paste to the flanges of the body portion of the bottle and the bottom, one of said plungers being greater in diameter than the bottom of the bottle and arranged to force the flanged body portion of the bottle onto the flanged bottom after the pasting operation, and means for applying a locking disk to the bottle.

20. The combination in a machine for manufacturing paper bottles and like articles, of an intermittently operated carrier, forms thereon, plungers actuating in conjunction with the forms to assemble the parts of the bottle, a pasting device consisting of a shaft, arms on the shaft, pasting fingers carried by the arms, a paste receptacle, a reciprocating means, driven by

the mechanism of the machine, a rack pivoted to the said means, a pinion engaging with the rack and mounted loosely on the shaft of the pasting device, pawl and ratchet mechanism between the said pinion and the shaft, whereby the said pasting device is turned one-half a revolution in one direction as the carrier is intermittently moved.

21. The combination in a machine for making paper bottles and like articles, of a standard, driving mechanism carried by the standard, a base supported on the standard, vertical posts projecting from the standard, a cross bar secured to the posts, a plate carried by each post, a hopper mounted on each plate, one hopper arranged to receive the bottom disks and the other the locking disks, a vertical rod passing through the base plate, a bearing for the rod, a carrier mounted on the rod and supported by the base, forms on the carrier, means for intermittently rotating the carrier, a disk mounted in each form having a spindle extending through the form, a cam ring on the base upon which the spindles rest, a head secured to the rod and guided by the posts, plungers secured to the underside of the head, said plungers being so positioned that when the carrier is at rest the plungers will be above certain of the forms, a pivoted selector under each hopper, means carried by the head for actuating the selectors, a discharge device pivoted to the cross bar and connected to the head, said discharge device having means for engaging the bottle after it is assembled.

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

HENRY R. HEYL.

Witnesses:

WM. E. SHUPE,

WM. A. BARR.