(No Model.)

3 Sheets—Sheet 1.

E. J. BOYD.

APPARATUS FOR APPLYING LABELS TO BOTTLES, &c.

No. 547,763. Patented Oct. 15, 1895.

Fig. 1.

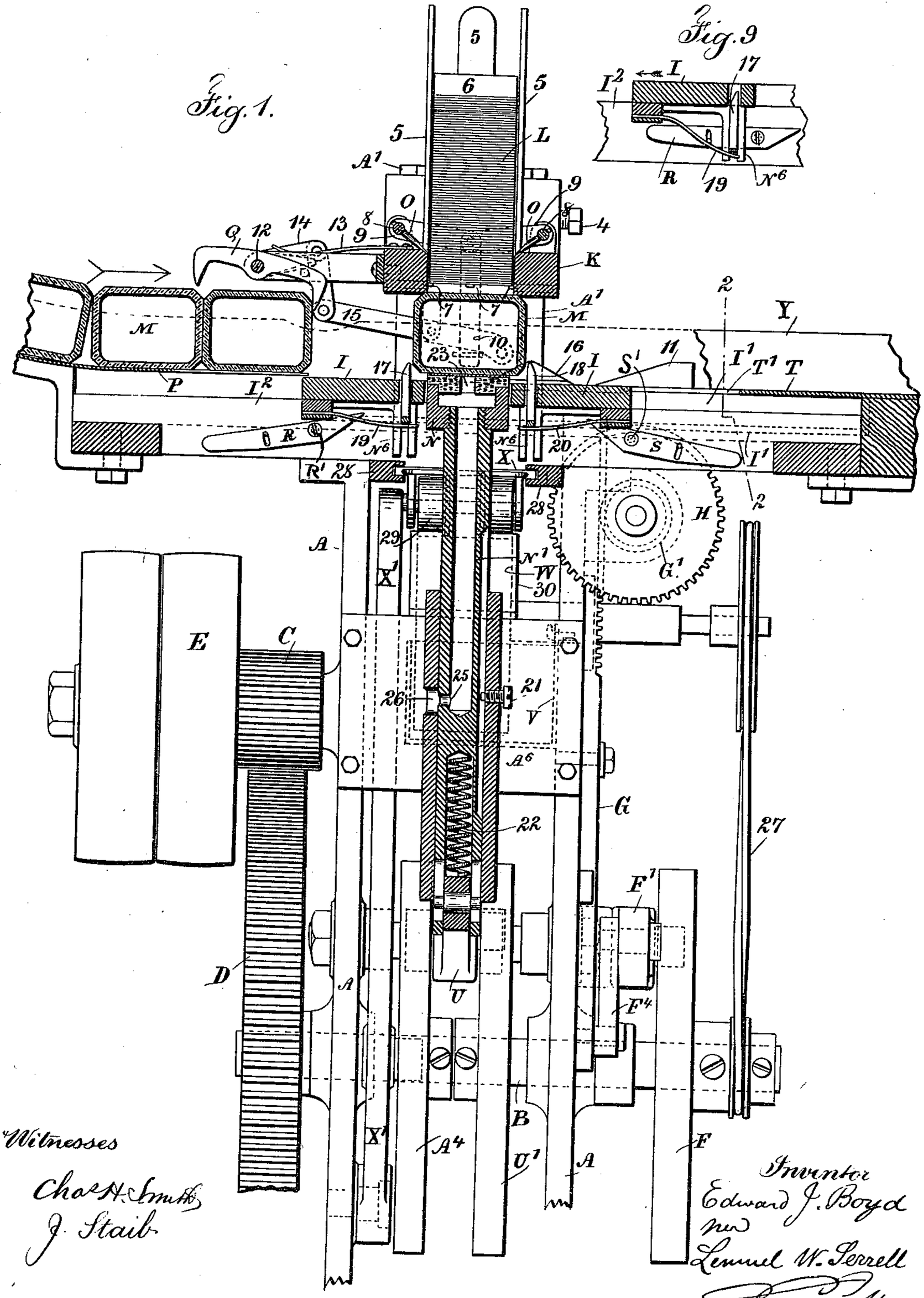

Fig. 2.

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3 Sheets—Sheet 2.

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Fig. 3.

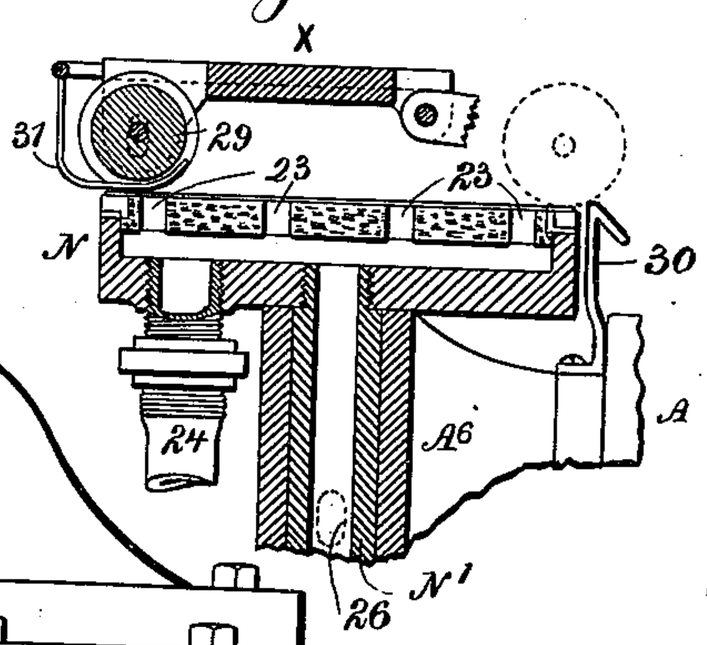

Fig. 2.

Fig. 8.

Fig. 4.

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Fig. 6.

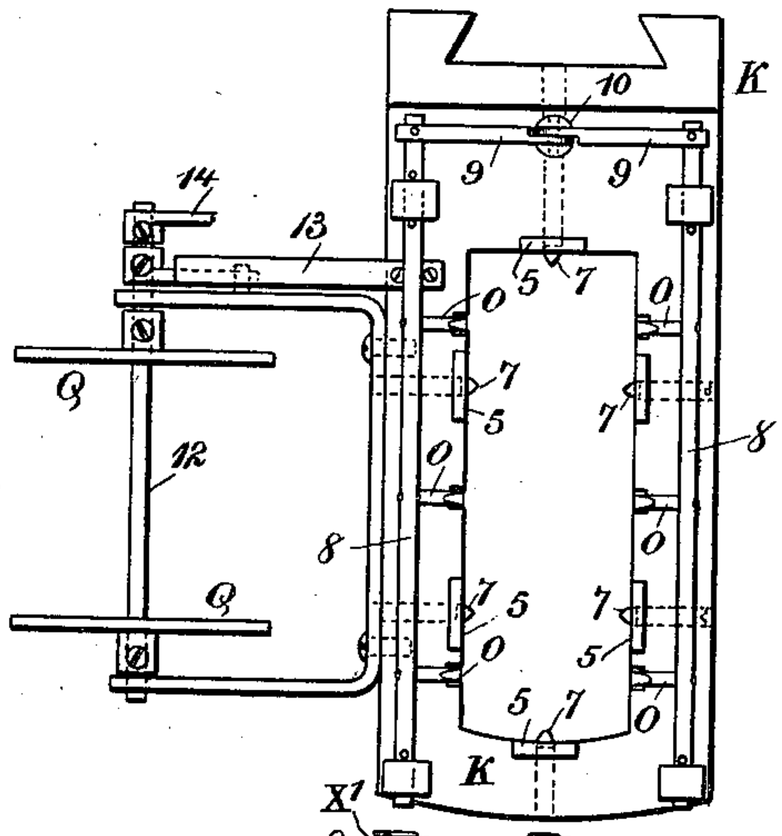


Fig. 7.

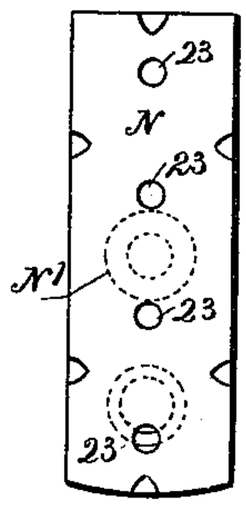
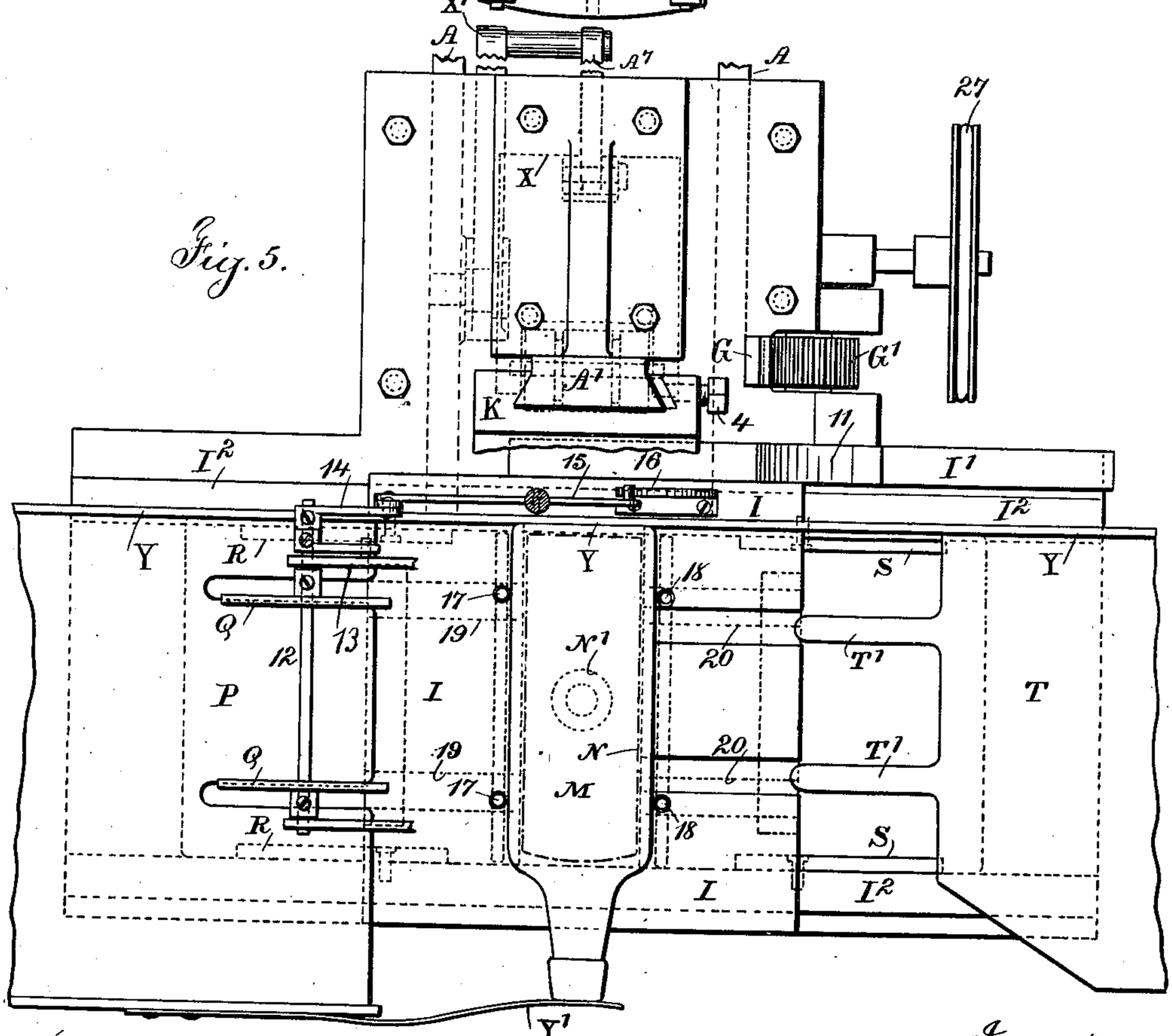


Fig. 5.



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UNITED STATES PATENT OFFICE.

EDWARD J. BOYD, OF NEW YORK, N. Y.

APPARATUS FOR APPLYING LABELS TO BOTTLES, &c.

SPECIFICATION forming part of Letters Patent No. 547,763, dated October 15, 1895.

Application filed November 23, 1894. Serial No. 529,680. (No model.)

To all whom it may concern:

Be it known that I, EDWARD J. BOYD, a citizen of the United States, residing at the city, county, and State of New York, have invented an Improvement in Apparatus for Applying Labels to Bottles and other Articles, of which the following is a specification.

In this machine the labels are retained in a pile and a follower is brought up against the pile of labels and by a suction action a label is taken from the pile and held upon the follower while adhesive material is applied to the back of the label, and then the label is carried up and pressed by the follower against the bottle or other article, and at this time the suction is relieved, so that the label is allowed to remain upon the bottle or other article.

In carrying out this invention the bottles are fed into the machine, preferably by hand, and allowed to slide down an incline, and there is an escapement that holds back the row of bottles while the end bottle in the row is taken by a bed with dogs or fingers and carried to the place where the label is applied, and then the bed is moved along and the bottle delivered, the dogs or fingers that are in front of the bottle being withdrawn, and upon the back movement of the bed beneath the lowest bottle in the row of bottles the dogs or fingers are moved so that they come at opposite sides of the bottle to carry the same along to receive the label. The parts are timed and arranged in such a manner that the label is taken nearly simultaneously with the grasping of a fresh bottle by the dogs, and the follower descends, carrying the label with it, and then rises to apply the label to the under side of the bottle.

In the drawings, Figure 1 is a vertical section through the follower and its standard. Fig. 2 is a side elevation with the slideway of the bed in section at the line 2 2 of Fig. 1. Fig. 3 is a detached sectional view representing the follower and the paste-roller. Fig. 4 shows the paste-roller and the fingers that are used with the same. Fig. 5 is a plan view of the bed with a bottle in position for receiving a label, the head which carries the pile of labels being removed. Fig. 6 is a plan view of the head carrying the labels detached. Fig. 7 is a plan view of the surface of the follower. Fig. 8 is an elevation of one pair of dogs or fingers and their connecting-bar; and Fig. 9 is a partial section of the bed, showing the fingers and their cam.

The machine is provided with a suitable frame, portions of which are shown at A, and there is a driving-shaft B supported by the frame and driven by a pinion C and gear-wheel D, the pinion receiving its rotation from a belt to a pulley E, and it is advisable to provide a loose pulley and belt-shifter for stopping the machine; and I remark that it is advantageous to drive the machine by a comparatively slack belt, in order that the belt may slip in case a bottle that is imperfect or too large passes into the machine, so that the pressure applied by the follower to the label may not cause the bottle to break, and the slipping of the belt allows the machine to be stopped and such imperfect bottle removed.

Upon the driving-shaft B are the cams for giving motion to various parts of the machine, among which is cam F, which gives motion to a lever F′, that is connected by the link F^4 with the vertical rack-bar G, that gears with a pinion G′ upon a shaft that also carries a gear-wheel H, that engages a longitudinal rack I′ upon the moving carrier or bed I, that is supported in slideways I^2, that are connected with the frame of the machine; and rising above the frame is a standard A′, upon which is supported a head K, that can be raised or lowered to adapt the machine to different sizes of bottles or similar articles, and a screw 4 is provided for holding the head in any position where the same may be placed. This head K has an opening through it slightly larger than the labels that are to be applied, so that the labels can form a pile and be guided by the studs or bars 5, that project upwardly from the head, and there is a weight 6 to keep the labels downwardly with the desired force, and there are inwardly-projecting claws or small plates 7, upon which the edges of the labels rest, and these are sufficiently numerous to support the pile of labels L and the weight 6, but the claws are sufficiently small to allow the bottom label to be drawn away from the pile of labels by the action of the follower N, as hereinafter described. If the weight of the pile of labels and of the weight 6 rested upon the claws 7, when an attempt was made to withdraw the bottom

label in the pile there might be difficulty in so doing. In order therefore to relieve the bottom label of the principal portion of the weight of the pile of labels and of the weight 6, I make use of lifters O in the form of fingers projecting from the rocks hafts 8, there being one shaft at each side of the pile of labels and preferably two or three fingers projecting from each rock-shaft, their ends being closely adjacent to the top surface of the head K and of the outer edges of the labels in the pile of labels, and these rock-shafts 8 are given a motion at the desired time by arms 9, that are connected together and to a link 10, which link is acted upon by a cam 11 upon the carrier or bed I, which cam comes into contact with the link and causes the lifters O of the rock-shafts to press against the edges of the labels and slightly lift the whole pile of labels and the wheight 6, thereby relieving the labels that are below the ends of the lifters O from the superincumbent weight and allowing the bottom label in the pile of labels to be easily taken away by the follower. A spring on the link 10 returns the parts to their normal positions.

The bottles M or other articles to which labels are to be affixed are laid upon a suitable incline, advantageously formed of sheet metal, as at P, and which incline may be extended to any desired extent, so that there may be a row or range of bottles constantly passing down into the machine as they are fed automatically, and in order to arrest the end bottle in the row of bottles I make use of an escapement Q upon a shaft 12, and there is a spring 13, that tends to hold the tooth of the escapement at the side of the bottle which is next to the head K, and the length of the escapement between one tooth and the next is to correspond, or nearly so, to the width of the bottle, so that when one end of the escapement is lifted for the passage of the bottle the other end of the escapement will pass down between that bottle and the next bottle in the row and hold the row of bottles until the escapement receives a reverse movement. I find it advantageous to make use of two escapement-bars upon the one shaft 12, so that they act near the upper and lower ends of the bottle, and in order to move the escapement at the proper time there is a crank-arm 14 upon the shaft 12 and a link to the lever 15, and a cam 16 upon the carrier-bed gives motion to the lever and to the escapement at the proper time for rocking such escapement to allow one bottle to be taken off by the carrier-bed and hold the row of bottles at that time, and then the escapement is rocked the other way to allow the next bottle to pass under and be stopped by the escapement in position to be taken away by the next movement of the carrier-bed. Where the shape of the bottle or similar article is such that it will act against the end of the escapement that is next to the head K and lift that part of the escapement by running under it, so as to throw the end that is distant from the head K against the side of the next bottle, then the lever 15 and cam 16 can be made to act in the same direction as the spring 13 to throw the point of the escapement Q that is next to the head downwardly to insure it catching the bottle that next passes under the escapement; but, if desired, the cam and lever can be made to act in the opposite direction to lift the end of the escapement that is next to the head K against the action of the spring, and allow the spring to return such end of the escapement to position immediately after the cam has passed from contact with the lever.

The carrier-bed I is made with an opering near the middle of it sufficiently large for the follower N to pass up through the same freely in applying the label, and this carrier-bed also is provided with vertically-acting dogs or fingers 17 and 18, that are fitted in slides N^6 to move vertically through openings in the bed, and it is advantageous to provide springs 19 and 20, that serve to raise up these fingers, and the fingers are upon cross-bars, the ends of which come into contact with the cams R and S, which are advantageously made in the form of wedges that are pivoted at R′ and S′ at opposite sides and facing each other upon the inner surfaces of the slideway I^2, upon which the carrier-bed I is reciprocated, as aforesaid, and these cams R and S are placed and shaped so as to act in the following manner: As the bed I is moved toward the left in Fig. 1, so as to pass under the lower bottle in the line of bottles, the cams R draw down the fingers 17, (see Fig. 9,) so that their upper ends are below the surface of the carrier-bed, and the movement of the bed carries the cross-bar of the fingers 17 beyond the back ends of the pivoted cams R, and these cams R drop and come below the ends of the cross-bar carrying the fingers 17, and the springs 19 throw up the fingers between one bottle and the next, and it will be noticed that the upper ends of these fingers 17 are wedge-shaped, so as to enter easily between the bottles, and the cross-bar of the fingers 17 overruns the cams R. Hence the fingers are kept up and carry the bottle along throughout the entire movement of the bed I toward the right in Fig. 1, and during the time that the bottle is being carried from the position of rest to the place shown in Fig. 1, where the label is applied to the bottle, the fingers 18 are projected up through the bed and hold the bottle properly in position between the fingers 17 and 18 while the label is being applied. As soon as the label has been applied, which is done during the time that the carrier-bed I is quiescent, the bed is again moved to the right, Fig. 1, by the action of the cam F upon the rack G, pinion G′, gear-wheel H, and rack I′, and the ends of the cross-bar carrying the fingers 18 underrun the cams S, and hence these fingers 18 are pulled down, and they allow the bottle to slide along upon the bed I

to whatever extent may be due to the momentum given to the bottle as the same is delivered from the machine, and as the bed I is moved back again to take another bottle the fingers 18 are allowed to be raised by the springs 20 as the ends of the cross-bar upon such fingers 18 clear the cams S, and the parts are in position to operate as aforesaid in taking another bottle. I remark that the length of the carrier-bed I is such that when a bottle is being received from the row of bottles, as aforesaid, the entire bed is to the left of the follower N, so that this follower N can come up and take a label from the pile of labels and go down again before the carrier-bed I commences its return movement to bring another bottle into position for applying the label.

Upon reference to Figs. 1 and 5 it will be observed that there is a stationary plate T, supported by the bed of the machine, and upon which the bottles are delivered after being labeled, and as it is important that the surface of this plate T should coincide with the surface of the carrier-bed I, so that the bottles may slide freely, the bed I is grooved for the reception of the tongues T′, that project from the stationary plate T over the space that would otherwise be open, and into which the bottle might partially descend by the momentum as the bottle is delivered; but these tongues T′ underrun the bottle and allow the same to slide freely upon the tongues, and these are additionally advantageous, as they present but a small contact-surface with the label, and hence there is but little tendency to displace the label as the bottles run over the tongues and upon the stationary plate.

I will next describe the peculiarities of the follower N, and the manner in which the labels are taken by it from the pile of labels and the paste applied to the upper surface of each label. This follower N is mounted upon a hollow slide-bar N′, which is preferably circular and guided by a screw 21, entering a groove in the slide-bar N′, and it is advantageous to apply a helical spring 22 in the tubular lower end of the slide-bar N′, against which the end of the lever U acts, such lever advantageously passing into a slot in the lower end of the slide-bar and having a plug and cross-pin immediately under the helical spring 22, and the cam U′ on the driving-shaft B is shaped in such a manner that during one rotation of the driving-shaft B the follower N is raised up to take a label from the pile of labels, and then the follower is drawn down sufficiently low to receive the paste from a roller, as hereinafter described, and then the follower is lifted to apply the label to the under side of the bottle. The cam U′ is shown with two projections, one longer than the other and of a shape adapted to effect the objects before mentioned. The spring 22 yields as the follower presses the label to the bottle. The tubular upper part of the slide-bar N′ opens into the hollow follower N, and it is advantageous to make the top surface of the follower of a properly-molded plate of rubber having holes 23 through it, and connected with the follower is a flexible air-pipe 24, that is connected with any suitable exhausting apparatus—such, for instance, as a rotary blower or pump—for effecting a minus atmospheric pressure within the follower N, so that when the follower is raised up and its rubber plate brought into contact with the lower label in the pile of labels the suction action through the holes 23 will seize the label and draw the same away from the pile of labels, especially when the weight of the pile of labels is relieved, as aforesaid, so that the follower brings the bottom label down with it as such follower descends to its lowest position, and at this time the paste is applied to the top surface of the label, and then the follower and label are brought up to apply the label to the under side of the bottle, which bottle has by this time arrived in the proper position for the follower, and at this moment it is necessary to momentarily relieve the atmospheric suction upon the label. I therefore provide a hole 25 in the slide-bar N′, coinciding with a hole 26 in the standard A^6, through which the slide-bar N′ passes, so that the follower can be drawn down and leave the label upon the bottle without any atmospheric action tending to detach the label from the bottle. It will be observed that when the follower is being drawn down to bring the label from the pile of labels into a position for receiving the paste these holes 25 and 26 coincide, but only momentarily, and hence the action of the exhaust is restored to hold the label in position while the paste is being applied. In order to apply the paste to the surface of the label, I provide a paste-trough V, receiving suitable adhesive material, and in this is a drum W, that is continuously rotated by suitable pulleys and a belt 27, and a scraper removes the surplus paste at the rising side of the revolving drum, and there is a carriage X, set in the slideways 28 and acted upon by a lever X′, link A^7, and cam A^4 upon the driving-shaft B, and this carriage X has upon it a paste-roller 29, set in vertically-slotted slideways, as seen in Fig. 3, so that the roller may rest by its weight upon the paste-drum and be revolved by it and receive upon its surface the paste or adhesive material during the time that the paste-roller is moved so as to be in contact with such drum W, and when the lever X′ gives motion to the carriage X and moves the paste-roller 29 away from the drum W such paste-roller is carried along and over the label as it is held upon the top surface of the follower N, thereby applying to such label the paste or other adhesive material during the time that the follower is in its lowest position, and then the paste-roller is drawn back and away from the label before the follower is lifted, as aforesaid, to apply such label. The contact of the paste-roller with the end of the label might tend to lift up that end

of the label and roll the label around the paste-roller. To prevent this, a lifter 30 is provided upon the standard A^6, Fig. 3, the upper end of which lifter is slightly higher than the end of the label as it lays upon the follower. Hence the paste-roller in passing over this lifter is raised sufficiently to drop upon the label at a little distance from the extreme end of the lable, and hence the label will not be lifted and rolled up. At the other end of the label a similar tendency to lift the extreme end of the label by the paste-roller exists, and to prevent such end of the label being lifted I provide the fingers 31, which are in the form of thin wires or strips passing down from the carriage which holds the paste-roller and along under such paste-roller and into grooves that are turned in the paste-roller. Thereby these fingers, being in close proximity to the surface of the label, prevent the end of the label being lifted up by the roller, and while it is true that the grooves in the paste-roller, into which these fingers 31 pass, prevent the paste-roller applying the adhesive material with perfect uniformity to the surface of the label the narrow lines where the paste is not applied do not interfere with the proper adhesion of the label to the bottle or other article.

It is important that the bottles or other articles are free to be moved along into the position for receiving the labels, but such bottles should be properly positioned endwise for the reception of the labels; and with this object in view a fence Y is applied for the bottoms of the bottles to run against, and a stationary spring Y′ is opposite the corks or necks of the bottles, such spring being curved and inclined, as shown in Fig. 5, so that it does not come into contact with the neck or cork of the bottle until such bottle arrives, or nearly so, at the position where the label is applied.

I claim as my invention—

1. The hollow perforated follower having a substantially flat surface and a suction device acting to hold the label by atmospheric pressure to the follower, in combination with automatic mechanism for feeding the bottles, a paste roller and means for moving the same over the label while held by suction upon the follower and automatic means for admitting air into the hollow follower as the label is pressed to the bottle, substantially as specified.

2. The combination in a machine for applying labels, of a head and claws for holding the labels, and guides for retaining the pile of labels in position, a weight for pressing down the pile of labels, and lifters and mechanism for moving the same and for raising the pile of labels sufficiently to relieve the lower labels from the weight at the time the bottom label is being removed from the pile, a carrier bed for the bottles or other articles, and means for reciprocating the same, and a follower having a hollow bed with openings and means for partially exhausting the air, and mechanism for supporting and moving the follower, substantially as set forth.

3. The combination in a machine for applying labels, of a carrier bed and means for moving the same to bring the bottle or other article into position for receiving the label, a hollow follower and means for partially exhausting the air, a tubular slide bar for the follower, and a support for the same, there being holes through the support and tubular follower which coincide at the time the label is being applied so as to relieve the atmospheric suction, substantially as set forth.

4. The combination with the incline down which the bottles are fed, of a reciprocating bed, fingers passing up through such bed and mechanism for moving the same and an escapement to hold back the line of bottles as the lower one is removed, and means for supplying and pasting each label and for applying it to the bottle during a pause in the movement of the bed, substantially as specified.

5. The combination with a hollow follower and a suction device therewith connected for holding the label to the follower by atmospheric pressure, of a paste trough and roller for applying paste to the label, and means for pressing the follower and label to the bottle or other article, substantially as specified.

6. The combination in a machine for applying labels, of a reciprocating carrier bed, fingers passing up through the bed, springs for raising the fingers, and cams for acting upon the ends of the bars carrying the fingers for drawing down one set of fingers when they pass below the stationary bottle and for drawing down the other set of fingers as the bottle is delivered from the reciprocating carrier bed, substantially as set forth.

7. The combination in a machine for applying labels, of a reciprocating bed for presenting the bottles or other articles, a follower and means for raising and lowering the same, a suction device for holding the label to the follower by atmospheric pressure, a paste trough and drum, a paste roller and a carriage and means for moving the same for rolling the paste roller over the label while held upon the follower, substantially as set forth.

8. The combination in a machine for applying labels, of a reciprocating bed for presenting the bottles or other articles, a follower and means for raising and lowering the same, a suction device for holding the labels to the follower by atmospheric pressure, a paste trough and drum, a paste roller and a carriage and means for moving the same for rolling the paste roller over the label while held upon the follower, a lifter over which the paste roller passes before coming into contact with the label, substantially as specified.

9. The combination in a machine for applying labels, of a reciprocating bed for presenting the bottles or other articles, a follower and means for raising and lowering the same, a

suction device for holding the label to the follower by atmospheric pressure, a paste trough and drum, a paste roller and a carriage and means for moving the same for rolling the paste roller over the label while held upon the follower the paste roller being grooved, and fingers in the grooves for preventing the paste roller lifting and rolling up the label in its movement, substantially as set forth.

10. The combination in a machine for applying labels to bottles and other articles, of a reciprocating carrier bed having an opening in the same, a follower and means for moving the same and passing the follower through the opening in the bed, means for holding a pile of labels in position for the follower to take a label and withdraw the same, means for applying the paste to the label while held upon the follower so that such label is applied to the bottle or other article upon the opposite side to the pile of labels, substantially as set forth.

11. The combination in a machine for applying labels, of a reciprocating carrier bed, means for supplying the bottles or other articles, a follower for receiving and applying the labels, a pasting mechanism, and a stationary plate with tongues passing into grooves in the carrier bed and upon which the bottle with the label attached is delivered, substantially as set forth.

Signed by me this 15th day of November, 1894.

EDWARD J. BOYD.

Witnesses:
GEO. T. PINCKNEY,
S. T. HAVILAND.