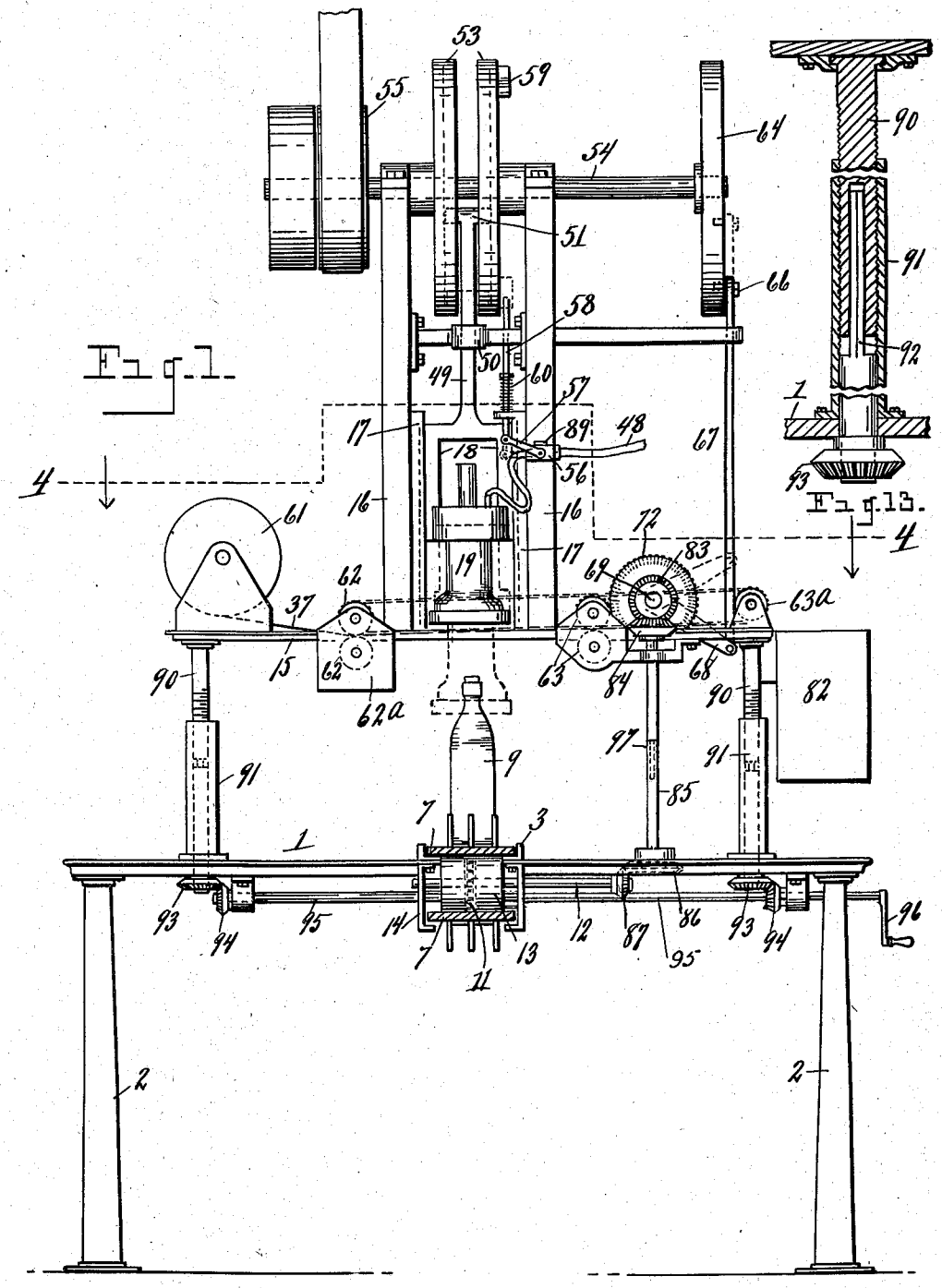
No. 840,710. PATENTED JAN. 8, 1907.

E. W. POTTS.

MACHINE FOR APPLYING CAPSULES TO BOTTLES.

APPLICATION FILED DEC. 27, 1904.

4 SHEETS—SHEET 1.



Witnesses:
O. B. Baenziger.
A. G. Howlett

Inventor
Elijah W. Potts.

By His Attorneys
E. W. Wheeler & Co.

No. 840,710. PATENTED JAN. 8, 1907.

E. W. POTTS.

MACHINE FOR APPLYING CAPSULES TO BOTTLES.

APPLICATION FILED DEC. 27, 1904.

4 SHEETS—SHEET 2.

Fig. 2.

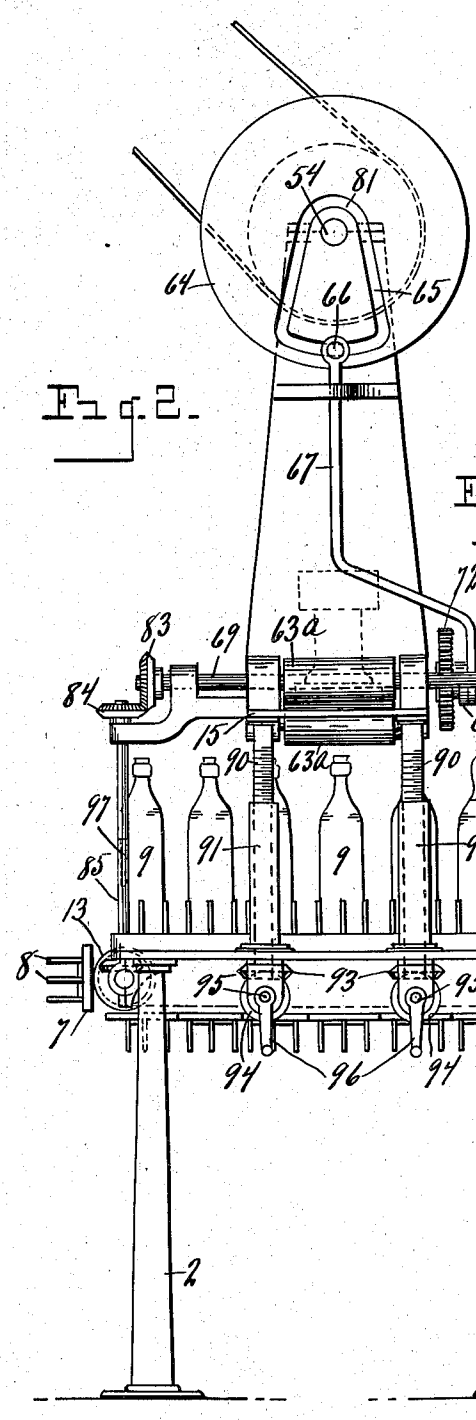
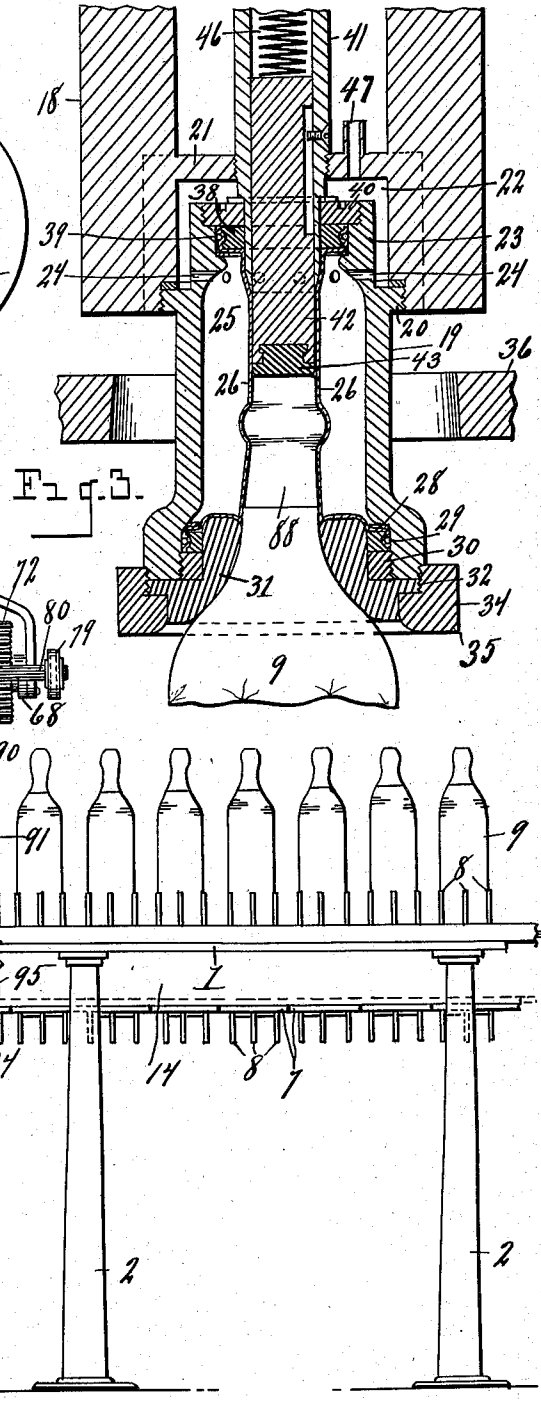


Fig. 3.



Witnesses:
O. B. Baenziger.
I. G. Howlett.

Inventor
Elijah W. Potts.

By His Attorneys
E. W. Wheeler & Co.

No. 840,710. PATENTED JAN. 8, 1907.

E. W. POTTS.

MACHINE FOR APPLYING CAPSULES TO BOTTLES.

APPLICATION FILED DEC. 27, 1904.

4 SHEETS—SHEET 3.

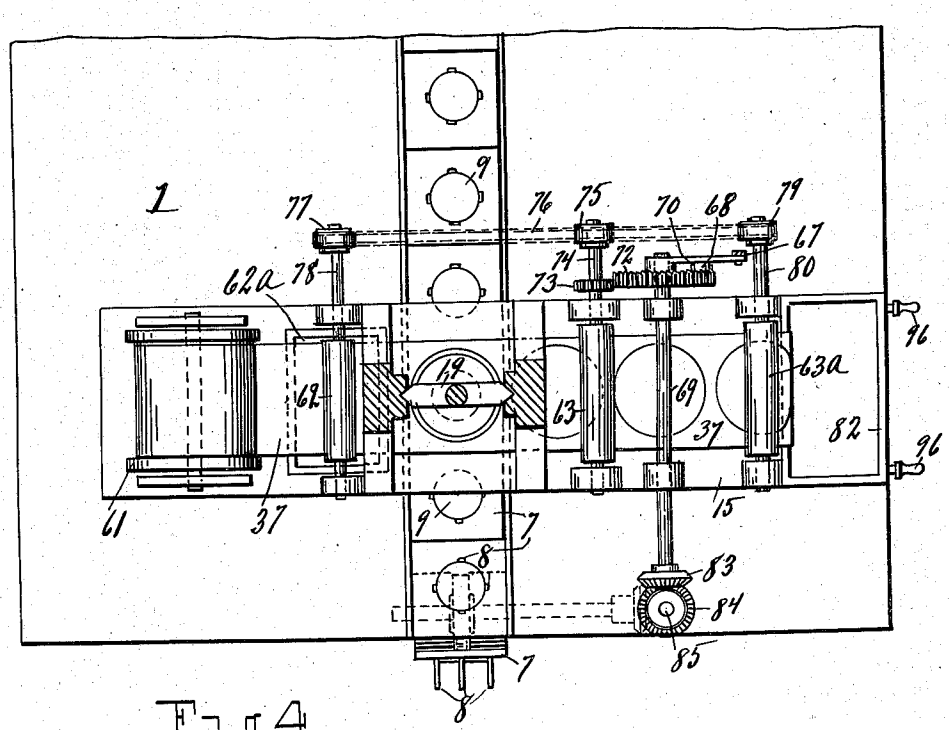


Fig. 4.

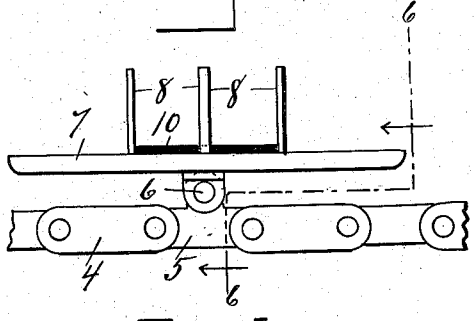


Fig. 5.

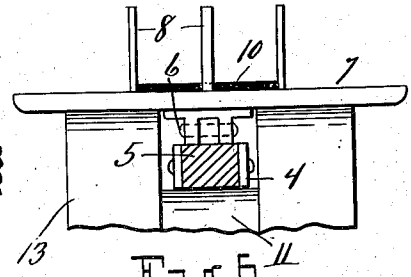


Fig. 6.

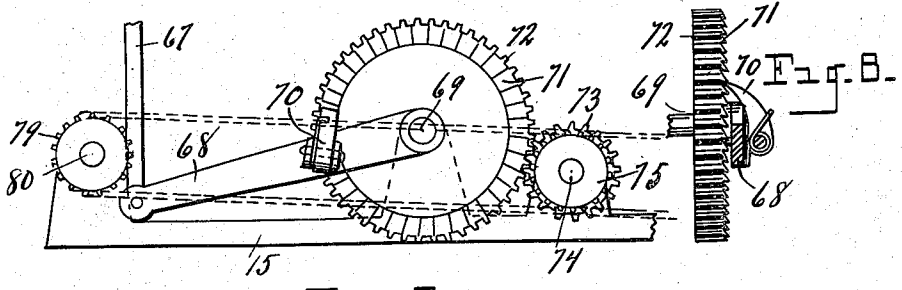


Fig. 8.

Fig. 7.

Witnesses:
C. B. Baenziger.
J. G. Howlett.

Inventor
Elijah W. Potts.

By His Attorneys
E. W. Wheeler & Co.

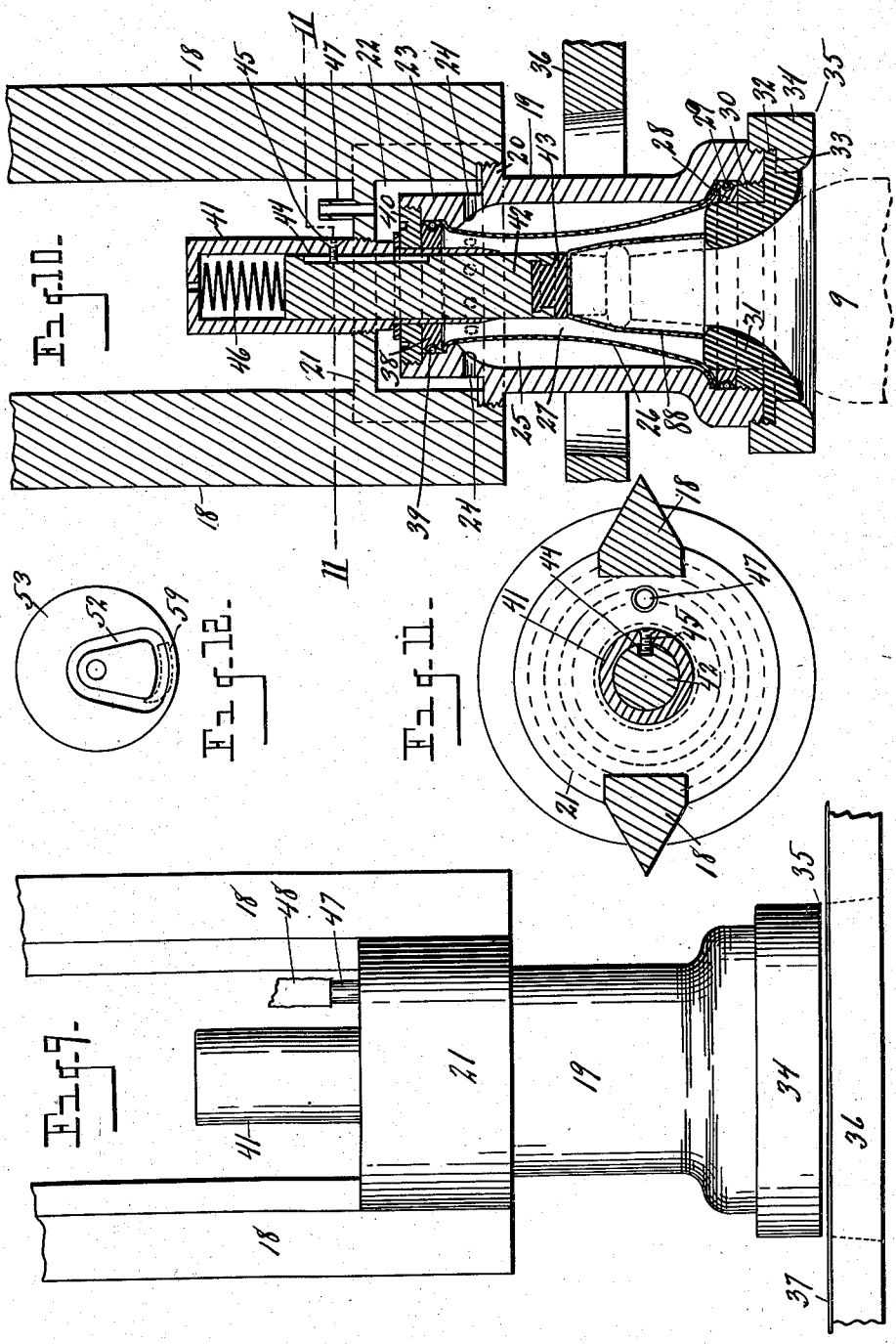
No. 840,710. PATENTED JAN. 8, 1907.

E. W. POTTS.

MACHINE FOR APPLYING CAPSULES TO BOTTLES.

APPLICATION FILED DEC. 27, 1904.

4 SHEETS—SHEET 4.



Witnesses:
O. B. Baenziger
S. G. Howlett

Inventor
Elijah W. Potts.

By His Attorneys
E. S. Wheeler & Co.

UNITED STATES PATENT OFFICE.

ELIJAH W. POTTS, OF DETROIT, MICHIGAN, ASSIGNOR OF ONE-FOURTH TO JOHN C. METZNER, OF DETROIT, MICHIGAN.

MACHINE FOR APPLYING CAPSULES TO BOTTLES.

No. 840,710. Specification of Letters Patent. Patented Jan. 8, 1907.

Application filed December 27, 1904. Serial No. 238,462.

To all whom it may concern:

Be it known that I, ELIJAH W. POTTS, a citizen of the United States, residing at Detroit, in the county of Wayne, State of Michigan, have invented certain new and useful Improvements in Machines for Applying Capsules to Bottles; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

This invention relates to a machine for placing tin-foil capsules upon the necks of bottles; and it consists in the construction and arrangement of parts hereinafter fully set forth, and pointed out particularly in the claims.

The objects of the invention are to produce a machine of the character described wherein the bottles are automatically carried into position, the capsules cut and placed thereon, and the bottles discharged from the machine. The above objects are attained by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a front elevation of the machine, the endless carrier appearing in transverse section. Fig. 2 is a side elevation of the machine, a portion of the end of the table being broken away. Fig. 3 is an enlarged vertical section through the compression-head, showing the position of the neck of a bottle therein when applying the capsules thereto. Fig. 4 is a horizontal section on line 4 4 of Fig. 1. Fig. 5 is a fragmentary view in elevation of a portion of the carrier or conveyer-chain, showing one of the bottle-holding stands mounted thereon. Fig. 6 is a sectional view as on line 6 6 of Fig. 5. Fig. 7 is a fragmentary view in elevation of a portion of the feeding mechanism. Fig. 8 is an edge view of the ratchet-wheel shown in Fig. 7, showing in elevation the pawl in engagement therewith. Fig. 9 is an elevation of the compression-head and the die through which said head passes in the operation of cutting the capsules, a strip of the foil from which the capsule is formed lying across the die. Fig. 10 is a central vertical section through Fig. 9, showing the compression-head descended upon the neck of the bottle in position preparatory to the application of pressure to force the capsule into place. Fig. 11 is a horizontal section as on line 11 11 of Fig. 10. Fig. 12 is an elevation of the inner face of one of the cam-disks which cause a vertical reciprocation of the compression-head. Fig. 13 is a sectional view in detail through one of the vertical adjusting-screws and its embracing threaded sleeve, through the operation of which the machine may be adjusted to accommodate bottles of varying heights.

Referring to the characters of reference, 1 designates a suitable table supported by the legs 2. Upon the top of the table and running longitudinally thereof is a confining-way 3, adapted to receive and direct the endless conveyer on which the bottles are presented to and carried from the capsule-applying mechanism of the machine. The endless conveyer comprises a suitable chain 4, (see Fig. 4,) the blocks 5 of which are pivoted at 6 to the bases 7. Projecting from the upper faces of the bases are the pins 8, so set as to receive and confine the bottles 9 when placed therein, said base and pins forming a bottle-receiving stand. These stands are placed as closely together upon the endless chain as they can be arranged, and upon the bottom thereof is a rubber pad 10, which serves to cushion the bottle and prevent it from becoming broken. The chain 4 passes over the sprocket-wheels 11 at the opposite end of the table 1, one of said wheels being mounted upon a shaft 12, through the medium of which the chain is driven. Mounted upon the shaft of each of the sprocket-wheels 11 is a roller 13, which stands upon opposite sides of said wheel and affords a bearing for the base 7 of the stands of the bottles 9 as said stands are rounding the sprocket-wheels when passing from the upper to the lower side of the table, and vice versa, thereby preventing the stands from tipping and getting out of position to properly enter the housing 14, secured to the under side of the table, which embraces and confines said stands while they are being returned to the initial end of the machine.

Supported above the table is a platform 15, carrying the parallel uprights 16, having upon their inner faces the vertical guideways

17, adapted to receive and direct the beveled slides 18, attached to the upper end of the compression-head. The compression-head, as shown in Figs. 3 and 10, is a hollow cylinder having at its upper edge a threaded flange 20, adapted to screw into a tapped opening in the lower end of the annular collar 21, to which the lower end of the slides 18 are secured. Within the annular collar 21 is an air-chamber 22, into which the reduced upper end 23 of the compression-head extends, there being through the wall of said reduced upper end portion of said head a plurality of apertures 24, establishing communication between the air-chamber 22 and the air-chamber 25 within said head. The inner wall of the chamber 25 within the compression-head consists of a diaphragm 26, of rubber or other elastic material, forming a socket or chamber 27, separated from the chamber 25 by said diaphragm. The lower end of said diaphragm is secured in the opening of the compression-head by means of a ring 28, having a peripheral channel in which the lower end of the diaphragm 26, which is tubular in shape, is confined by a binding-strand 29, said ring 28 being confined by a threaded ring 30, which screws against it. The upper end of the elastic diaphragm 26 is secured in the peripheral channel of the ring 38 by means of the binding-strand 39, lying in said channel, the ring 38 being confined by a threaded disk 40, which screws into the reduced upper end of the head 19. Screwed centrally through the collar 21 is a tube 41, whose reduced lower end passes through the disk 40 and ring 38 and extends into the chamber 27. Fitted to reciprocate within said tube is a plunger 42, having a rubber buffer 43 in its lower end, adapted to bear upon the cork of the bottle. In the plunger 42 is a longitudinal channel 44, into which extends a set-screw 45, which passes through the wall of the tube 41, whereby the plunger is confined in place within said tube and is permitted a longitudinal reciprocation. Confined between the upper end of the plunger and the upper end of the tube 41 is a spring 46 of such tension as to hold the plunger down against the cork of the bottle, yet permitting the plunger to move upwardly to accommodate a bottle of unusual height. Communicating with the interior of the air-chamber 22 is an air-pipe 47, adapted to be connected by a hose 48 to a source of air or other suitable fluid under pressure.

Lying within the lower opening of the compression-head against the rings 28 and 30 is a buffer 31, preferably of rubber, having a lateral flange 32, which lies against the lower end of said head and is confined by the shoulder 33 on the collar 34, which screws onto the lower end of said head, whereby the rubber buffer becomes securely retained in place. The collar 34 is provided with a lower cutting edge 35, which, in conjunction with the compression-head to which it is attached, forms a punch adapted to coact with the die 36, through which the lower end of the head passes in its reciprocatory movement, whereby the tin-foil capsules are blocked out from the sheet 37, which is fed over said die 36 when the head is raised, as shown in Figs. 1 and 9, said die being located in the platform 15 in the path of said reciprocatory head.

The compression-head is caused to reciprocate vertically through the medium of the connecting-rod 49, attached at its lower end to the vertical slides 18 and passing through the vertical guide 50, the upper end of said rod having a T-head 51, adapted to engage in the heart-shape camways 52 in the opposite faces of the opposed disks 53, mounted upon and rotatable with the main shaft 54, journaled in suitable bearings on the uprights 16 and carrying the belt-pulley 55, through the medium of which it is driven. It will be observed that a rotation of the shaft 54 will cause a reciprocation of the rod 49 through the engagement of its T-head in the camways therein, thereby reciprocating the compression-head. This vertical reciprocation of said head is necessary to cause it to descend over the neck of the bottle in the operation of applying the capsules and rise therefrom to permit the capsuled bottle to pass along and a succeeding bottle to take its place, at the same time severing the capsules from the strip or blank of the tin-foil and presenting them over the necks of the bottles in succession as said bottles are presented to said head. To control the passage of air to the chamber 25 in the compression-head, there is employed an ordinary three-way air-valve 56, actuated by a lever 57, pivoted to the lower end of a vertically-reciprocatory rod 58, whose upper end stands in the path of the curved lug 59 on the outer face of one of the disks 53. As said disks revolve to cause the head to descend upon the neck of a bottle the lug 59 at the proper moment will trip the rod 58 to open the valve and allow a flow of air into the chamber 25. When the lug 59 passes from contact with the upper end of the rod 58, the coiled compression-spring 60 thereon will return said rod and close the air-valve.

The tin-foil from which the capsules are cut preparatory to their application to the necks of the bottles is provided in the form of a narrow strip or sheet 37, wound upon a spool 61 and carried between the feed-rollers 62, the lower one of which turns in a paste-box 62^a, thence over the die 36, and between the feed-rollers 63. To provide for imparting an intermittent movement to the feed-rollers coincident with the upward movement of the compression-head, there is employed upon the end of shaft 54 a disk 64, having in the side thereof a camway 65, into

which extends the pin 66, carried at the upper end of the angular reciprocatory rod 67, whose lower end is pivoted to an arm 68, journaled on the end of the shaft 69, mounted in suitable bearings on the platform 15. Carried by the arm 68 is a spring-actuated pawl 70, adapted to engage the ratchet-teeth 71 on the side of the gear-wheel 72 upon the shaft 69. By this arrangement as the shaft 54 revolves the camway in the disk 64 will raise the rod 67 and actuate said pawl to impart an intermittent rotation to the gear-wheel 72 and the shaft 69. This movement is transmitted to the feed-rollers through the medium of the pinion 73 on the shaft 74 of one of the rollers 63. On the end of shaft 74 is a sprocket-wheel 75, over which passes sprocket-chain 76, said sprocket-chain also passing over the sprocket-wheel 77 on the shaft 78 of one of the rollers 62 and over the sprocket-wheel 79 on the shaft 80 of one of the rollers 63^a, whereby as the compression-head 19 is traveling upwardly in its reciprocatory movement the sheet of tin-foil is fed along such distance as to present a new blank for a succeeding capsule over the orifice in the die 36, so as to enable said blank to be struck therefrom upon the next descent of said punch and carried upon the neck of the bottle below. The shape of the camway 65 is such that during the vertical reciprocation of the compression-head the pin 66 will lie in the concentric portion 81 of said way and impart no movement through the connected parts to the rollers. The strip of tin-foil 37 from which the blanks have been cut is fed by the rollers 63 into a suitable receptacle 82. To impart to the endless carrier which conveys the bottles into position under the reciprocatory compression-head and properly time the movement of said parts, the shaft 12, which drives the endless chain or carrier containing the bottle-stands, is in turn driven through the medium of the shaft 69, upon the end of which is a beveled wheel 83, which meshes with a like wheel 84 on the vertical shaft 85, on the lower end of which is a beveled gear-wheel 86, which meshes with the beveled pinion 87 on the shaft 12.

In the operation of the machine the rotation of the shaft 54 will cause a vertical reciprocation of the compression-head and punch, an intermittent feeding of the sheet of tin-foil, and an intermittent movement to the endless carrier, which presents the bottles in the path of the reciprocatory head. The bottles are placed in the stands upon the carrier by hand or in any suitable manner and are presented successively in the vertical path of the reciprocatory head, which upon its descent cuts a blank of tin-foil from the sheet and places it over the neck of a bottle, as shown at 88 in Fig. 10, in which position the rubber buffer 31 makes an air-tight closure upon the neck of the bottle and the rubber buffer 43 exerts a downward pressure upon the cork. When the parts are in said position, the air-valve is opened through the operation of the lug 59 upon one of the cam-disks 53 and air permitted to enter the chamber 25 under sufficient pressure to force the elastic diaphragm 26 into contact with the contour of the cork and neck of the bottle, as shown in Fig. 3, thereby compressing the capsule 88 tightly into place without injury thereto. After the capsule has been firmly forced into place the lug 59 will have passed from engagement with the end of the rod 58, when the spring 60 will raise said rod and open the valve 56, which is a common three-way valve, thereby allowing the air in chamber 25 to escape to the atmosphere through the port 89. A further rotation of the shaft 54 will cause the compression-head to rise, and the carrier will be moved along to carry a succeeding bottle into position, and the feed-rollers will be actuated to present a new blank of tin-foil over the die 36, following which the compression-head will again descend and the operation will be repeated. When the carrier containing the bottles which have been capped or to which the capsules have been applied reaches the end of the table, they are removed from the stands of the carrier in any suitable manner. To provide for raising and lowering the platform 5, so as to accommodate various heights of bottles, said platform is supported at its corners upon the screw-shafts 90, which pass downwardly through the threaded sleeves 91, supported on the table 1. Said shafts 90 are made telescopic, as shown in Fig. 13, there being a square socket formed in the lower ends of the upper sections thereof, which receives the reduced squared end portions 92 of the upper ends of the lower sections thereof, said lower sections passing through the sleeves 91 and receiving upon their lower ends the beveled gears 93, which mesh with like gears 94 on the horizontal shafts 95, which extend transversely of the table and carry at their outer ends the cranks 96, through the medium of which they may be rotated. Upon the rotation of said shafts 95 the screw-shafts 90 are turned so as to screw them into and out of the sleeves 91, and thereby vary the distance between the platform 15 and the table 1, so as to adjust the machine to bottles of various heights. In order to provide for the vertical movement of the platform 15, the vertical shaft 85 is provided with a telescopic joint, as shown at 97.

Having thus fully set forth my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A machine for applying tin-foil capsules to bottles, comprising a reciprocatory compression-head adapted to receive the neck of a bottle, a flexible diaphragm within

said head for compressing the capsule around the neck of the bottle, a pressure-chamber surrounding said diaphragm, a valve-controlled passage connecting said pressure-chamber with a source of fluid under pressure, and means for operating said valve to automatically open and close said port when said head is embracing the neck of the bottle.

2. A machine for applying foil capsules to bottles, comprising a compression-head adapted to move over and embrace the neck of a bottle, a flexible diaphragm adapted to surround the neck of the bottle within said head, a pressure-chamber around said diaphragm, means for admitting air to said chamber and discharging it therefrom while the neck of the bottle is within the compression-head and the reciprocatory plunger standing within the diaphragm and adapted to bear upon the cork of the bottle.

3. In a machine for applying capsules to bottles, the combination with the reciprocatory compression-head having a socket to receive the neck of the bottle and compress the capsules thereon, means for automatically placing the capsules on the necks of the bottles preparatory to their entrance into said head, means for operating said head to cause it to embrace the necks of the bottles and withdraw therefrom, and means for presenting the bottles successively to said head.

4. A machine for applying foil capsules to the necks of bottles, comprising a compression-head having a socket to receive the necks of the bottles and compress the capsules thereon, means for cutting the capsules and placing them upon the necks of the bottles in advance of the compressing operation, means for causing the capsules to forcibly conform to the necks of the bottles when embraced by said head and means for automatically presenting the bottles to and removing them from said head.

5. A machine for applying foil capsules to the necks of bottles, comprising a vertically-reciprocatory compression-head, a flexible diaphragm in said head adapted to embrace the necks of the bottles, a compression-chamber around said diaphragm, means for admitting fluid under pressure to said chamber, and exhausting it therefrom, a carrier movable under said head, said carrier having bottle-stands adapted to present the bottles successively in the path of said reciprocatory head, means for reciprocating said head and imparting an intermittent movement to said carrier.

6. A machine for applying foil capsules to the necks of bottles, comprising a reciprocatory compression-head adapted by its movement to descend over the necks of the bottles in succession and rise therefrom, means for applying the capsules to the necks of the bottles in advance of the descent of said head, feed-rollers for feeding the foil from which the capsules are cut, means for actuating said rollers intermittently, a horizontal conveyer carrying stands adapted to receive the bottles, said conveyer being movable to present the bottles successively in the path of the reciprocatory head and means for imparting an intermittent movement to said conveyer.

In testimony whereof I sign this specification in the presence of two witnesses.

ELIJAH W. POTTS.

Witnesses:
E. S. WHEELER,
I. G. HOWLETT.