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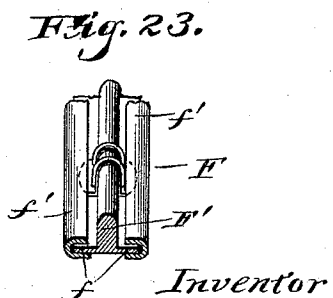
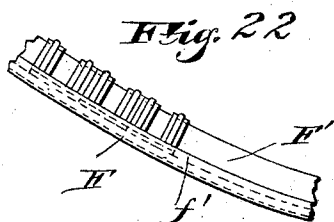
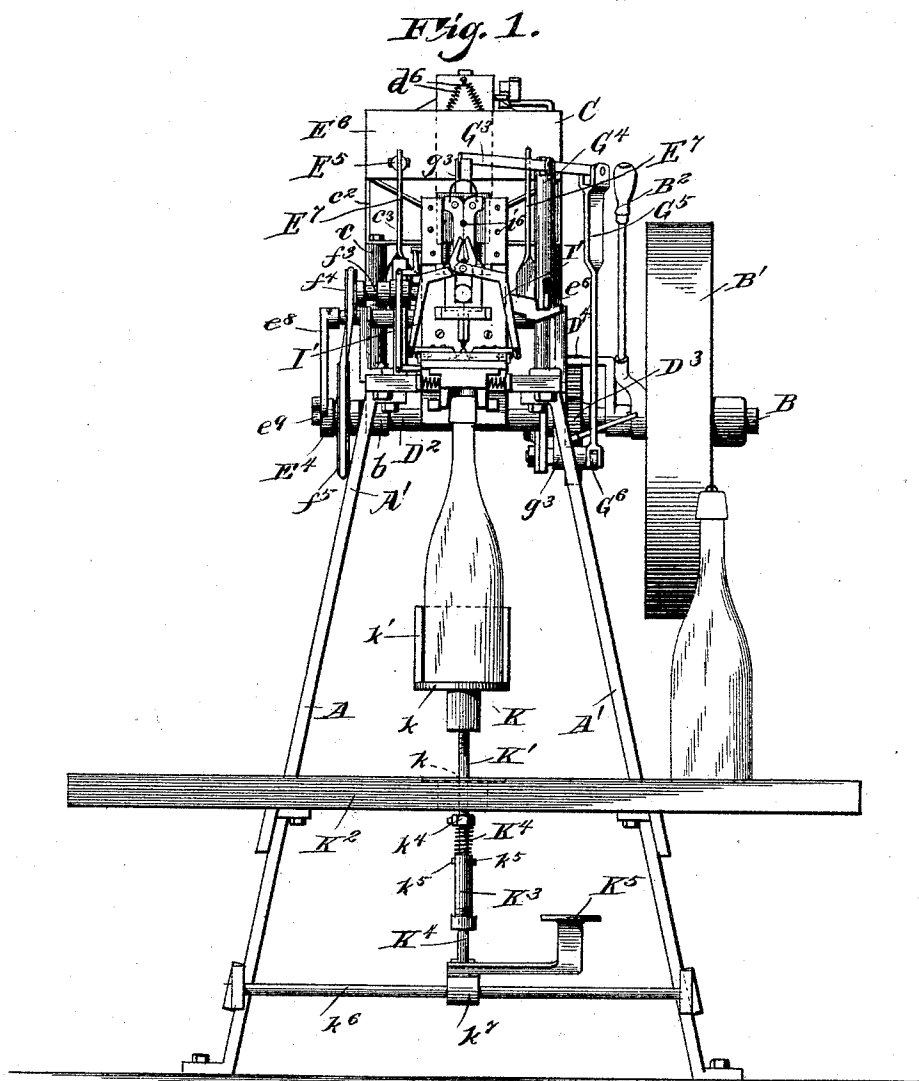
8 Sheets—Sheet 1.

A. J. SANDS.

MACHINERY FOR INSERTING STOPPER RETAINERS INTO BOTTLES.

No. 495,640.

Patented Apr. 18, 1893.



Witnesses:

Samuel A. A.
Louis M. F. Whitehead.

By Attorneys:
Maytore, Poole & Brown

(No Model.)

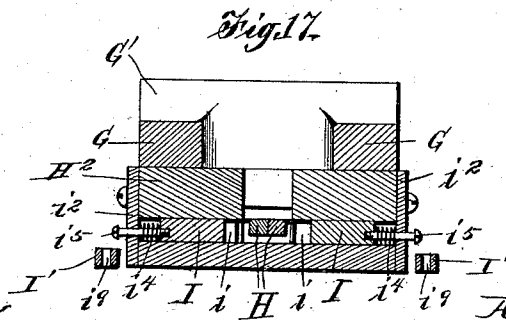
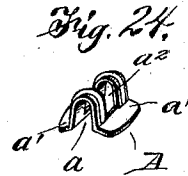
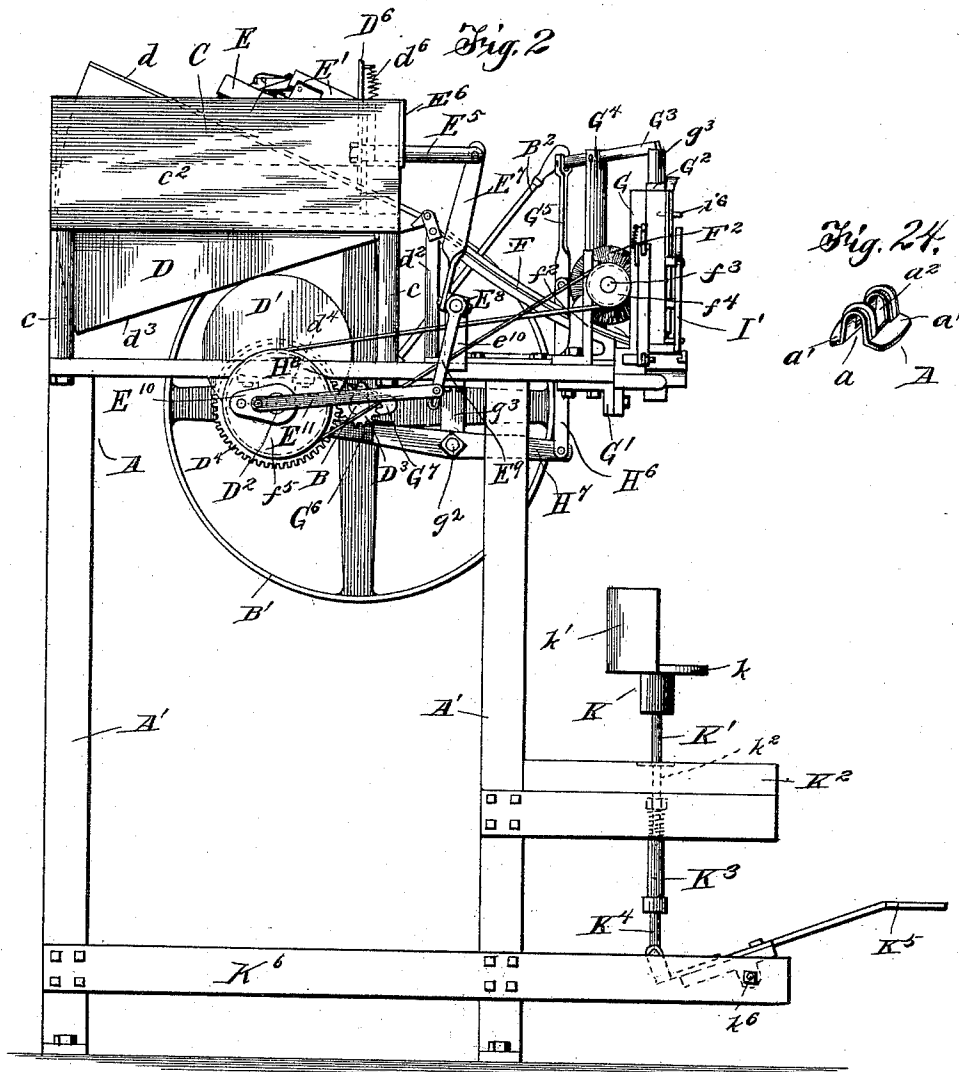
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Patented Apr. 18, 1893.



Witnesses.

Samuel Ker.
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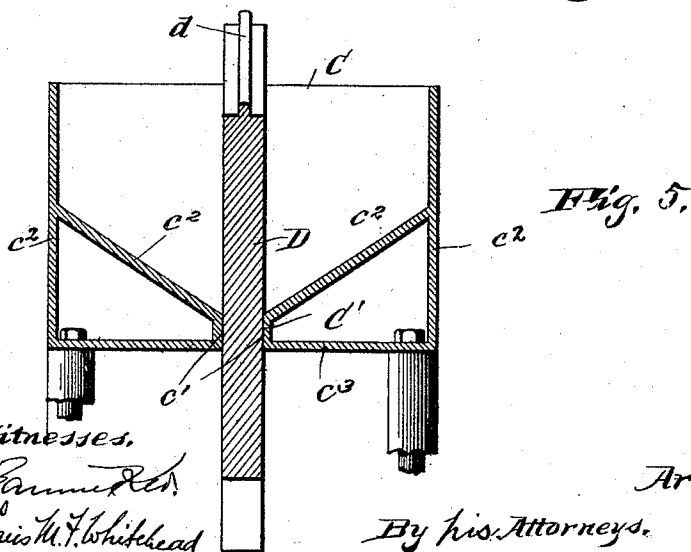
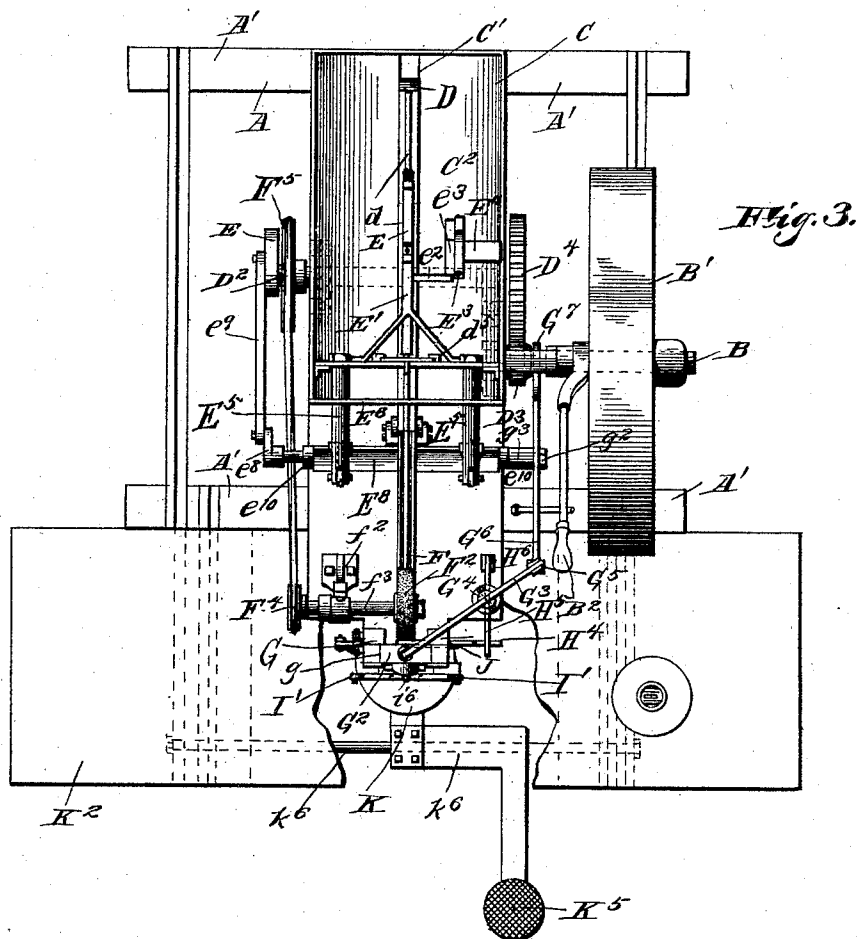
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No. 495,640.

Patented Apr. 18, 1893.



Witnesses,

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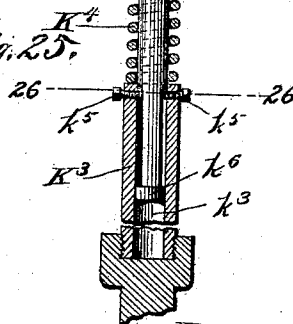
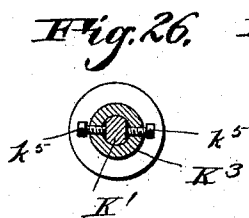
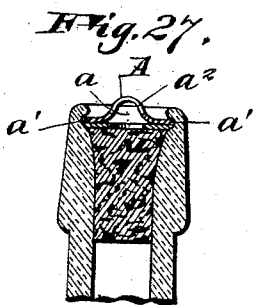
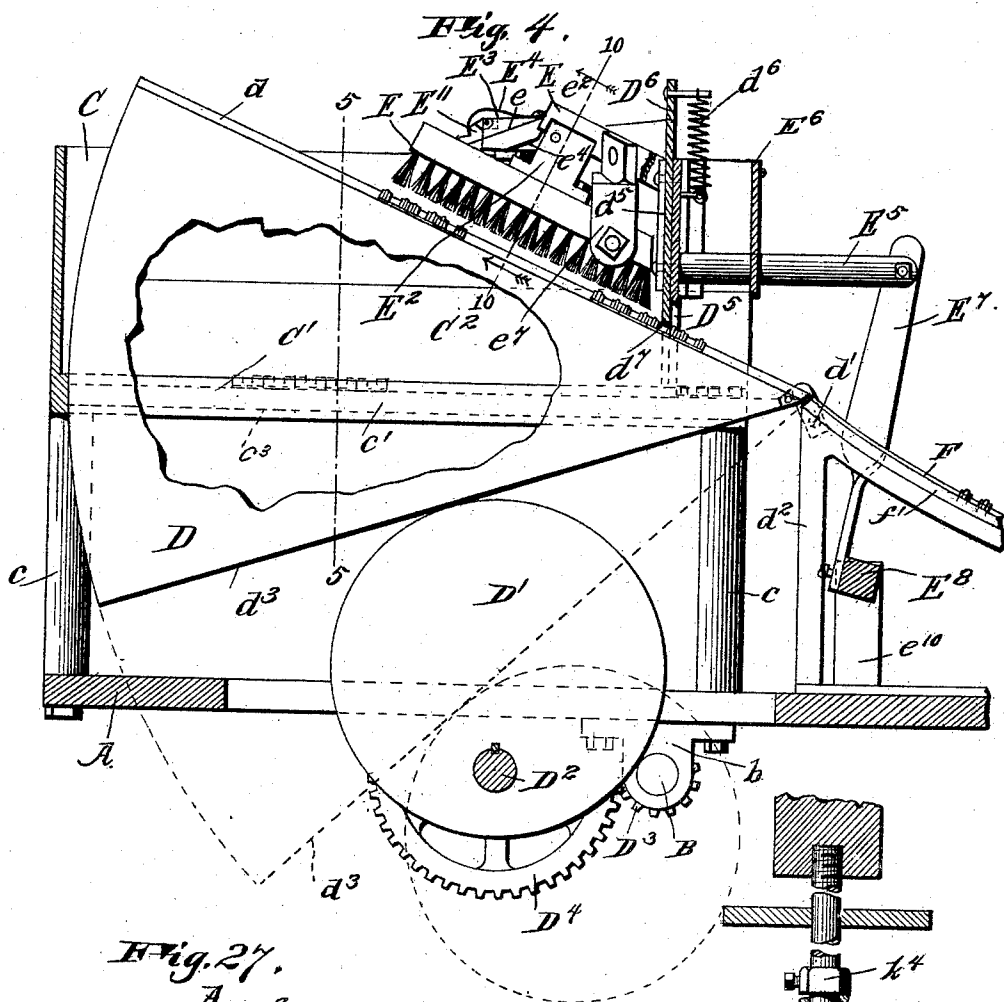
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A. J. SANDS.

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No. 495,640.

Patented Apr. 18, 1893.



Witnesses,
Samuel Red
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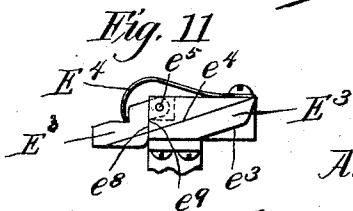
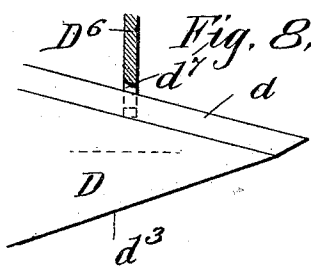
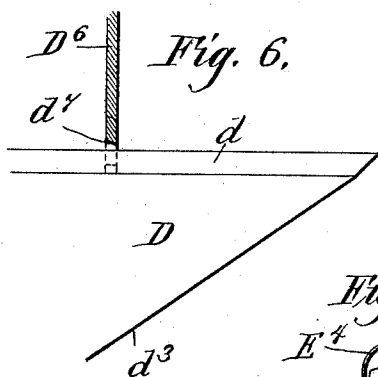
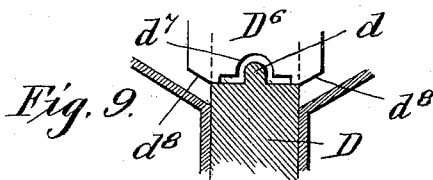
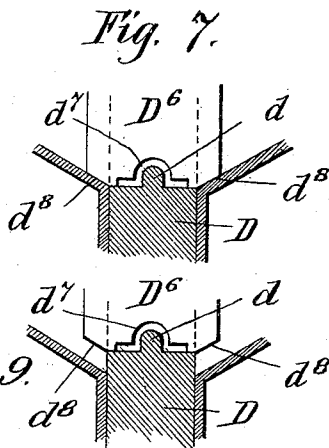
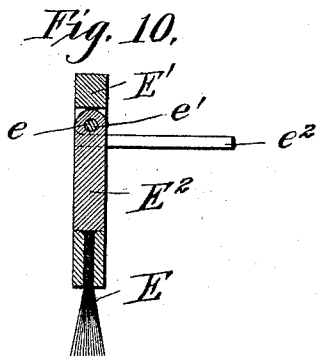
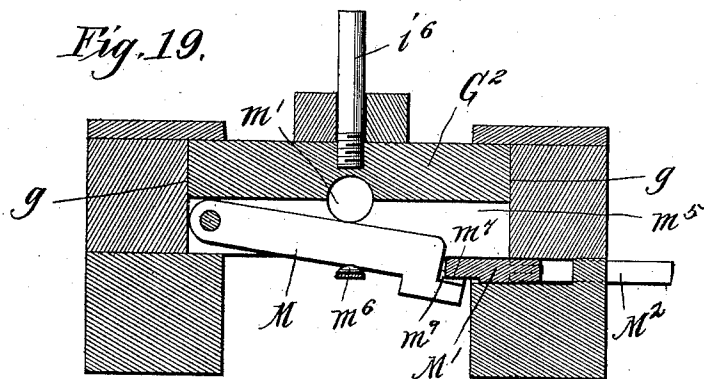
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Witnesses:

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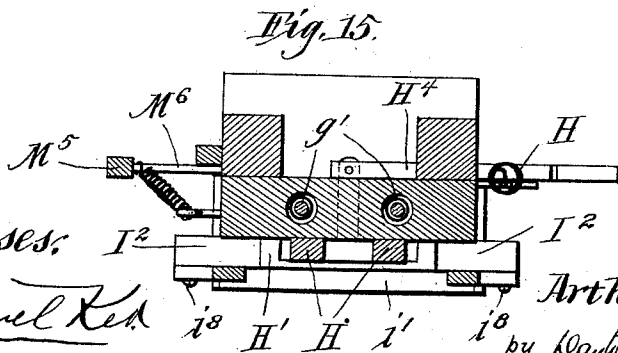
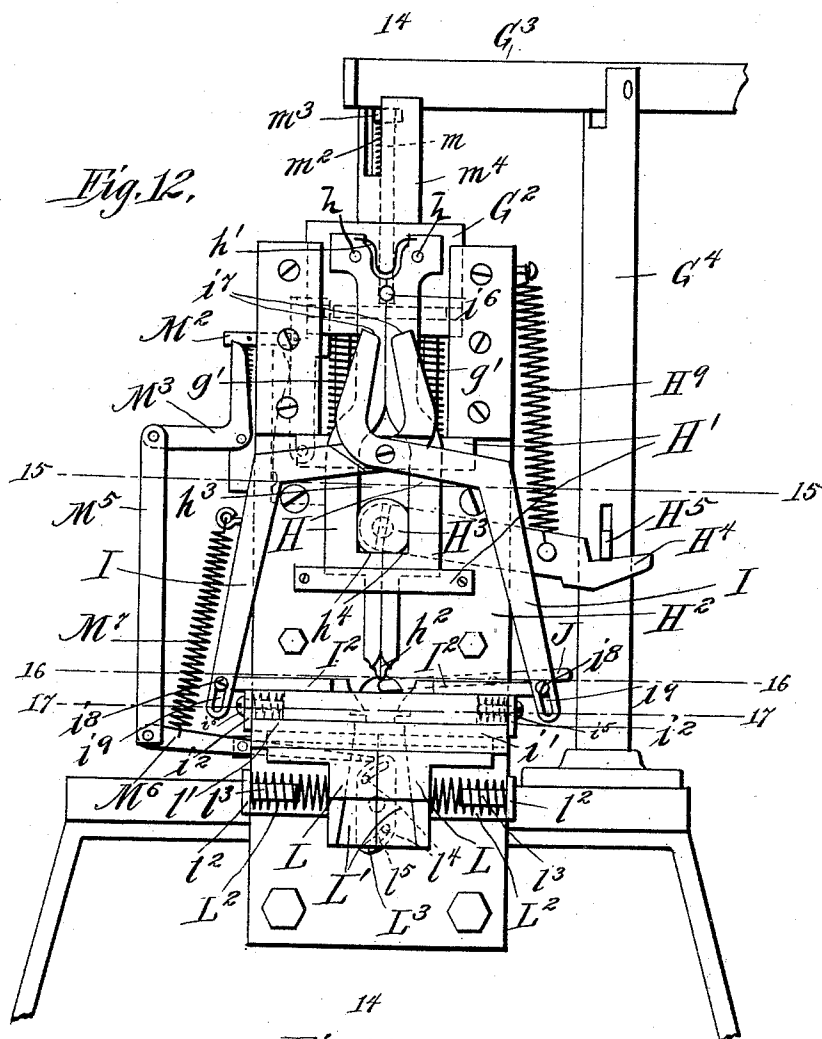
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MACHINERY FOR INSERTING STOPPER RETAINERS INTO BOTTLES.

No. 495,640.

Patented Apr. 18, 1893.



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(No Model.)

8 Sheets—Sheet 7.

A. J. SANDS.

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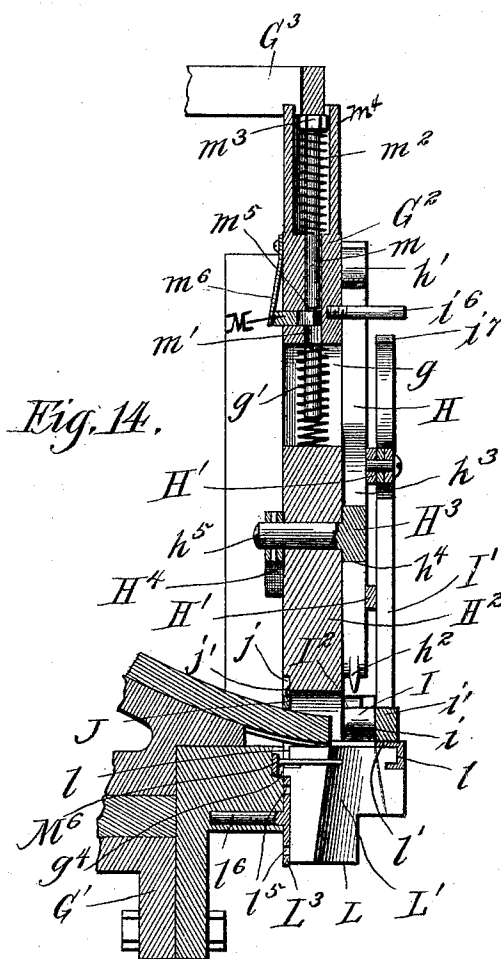
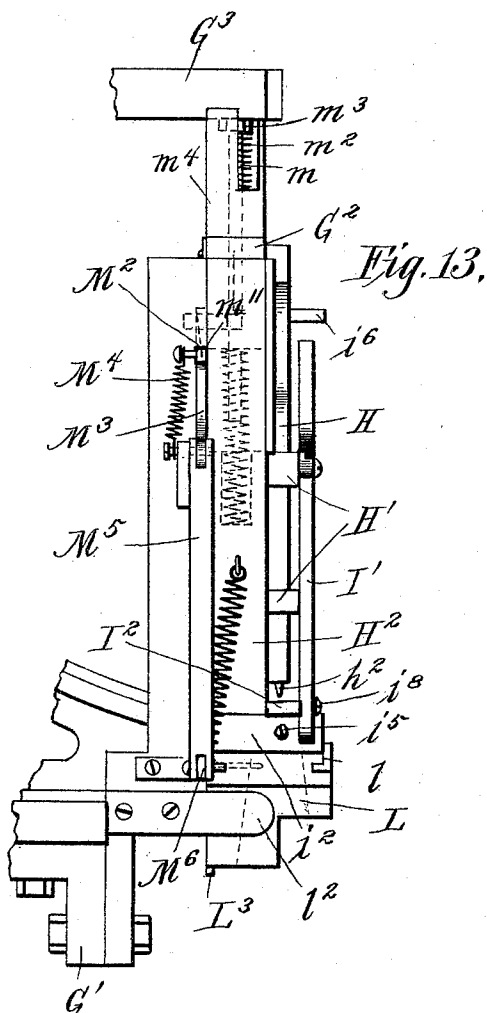
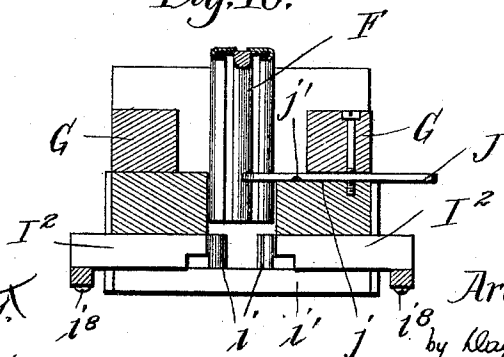


Fig. 16.



Witnesses—

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(No Model.)

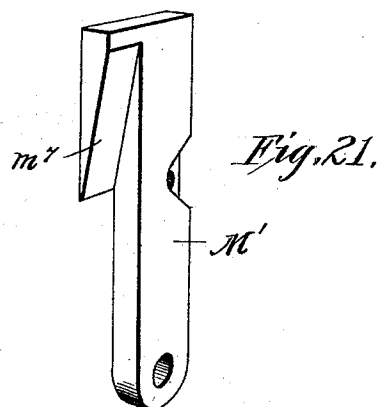
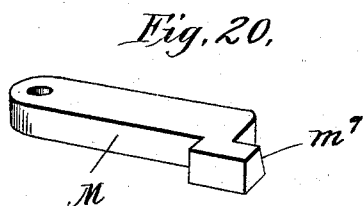
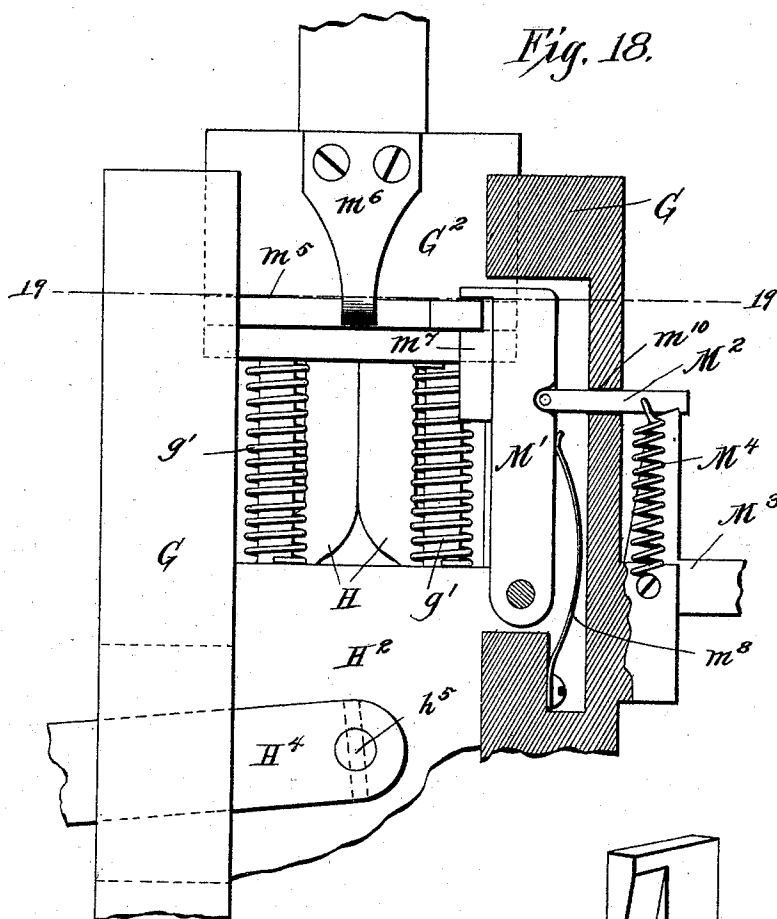
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A. J. SANDS.

MACHINERY FOR INSERTING STOPPER RETAINERS INTO BOTTLES.

No. 495,640.

Patented Apr. 18, 1893.



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UNITED STATES PATENT OFFICE.

ARTHUR J. SANDS, OF MERTON, WISCONSIN.

MACHINERY FOR INSERTING STOPPER-RETAINERS INTO BOTTLES.

SPECIFICATION forming part of Letters Patent No. 495,640, dated April 18, 1893.

Application filed May 19, 1892. Serial No. 433,595. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR J. SANDS, a citizen of the United States, residing at Merton, in the county of Waukesha and State of Wisconsin, have invented certain new and useful Improvements in Machinery for Inserting Stopper-Retainers into Bottles and other Vessels; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to machines or apparatus for automatically inserting into the necks of bottles and other vessels, fastening plates or bars of sheet metal so that the edges of said plates or bars shall be caused to engage an internal shoulder in the neck of said bottle or other vessel, above the cork or stopper proper thereof, and thus retain the stoppers in the necks of the bottles. In Letters Patent No. 409,374, issued to Josias J. Sands on the 20th day of August, 1889, is described and shown a retainer or fastener of the above described type for inserting which my invention is designed and adapted, said fastener consisting of a slotted arch with lateral extensions at the bottom thereof.

In the accompanying drawings which fully illustrate my improved machine: Figure 1 is a front view of said machine. Fig. 2 is a side elevation thereof. Fig. 3 is a top plan view thereof, with a part of the bracket table for holding the bottles broken away to more clearly show the support for the bottle while the latter is being operated upon. Fig. 4 is a longitudinal sectional view of the top of the hopper, showing the delivering segment and brush in projection. Fig. 5 is a transverse vertical sectional view of the hopper and delivering segment, taken on the line 5—5 of Fig. 4. Figs. 6, 7, 8 and 9 are diagrammatic sectional views, illustrating the method of operation of the gate which closes the slot in the front wall of the hopper. Fig. 10 is a transverse sectional view of the brush taken on the line 10—10 of Fig. 4. Fig. 11 is a detail view in side elevation of the cam block which imparts reciprocatory movement to the brush. Fig. 12 is an enlarged front view of the inserting mechanisms, the cross-head and

inserting levers being at their extreme elevation. Fig. 13 is a side view thereof. Fig. 14 is a vertical longitudinal sectional view thereof on the line 14—14 of Fig. 12. Figs. 15, 16 and 17 are horizontal sectional views thereof on the lines 15—15, 16—16 and 17—17, respectively, of Fig. 12. Fig. 18 is an enlarged partial rear elevation of the inserting mechanisms, showing the means for controlling the action of the inserting levers. Fig. 19 is a horizontal section thereof on the line 19—19 of Fig. 18. Figs. 20 and 21 are details in perspective showing the construction of the bar which is pivoted to the cross-head and of the catch which controls its operation. Fig. 22 is an enlarged side view of the chute leading from the hopper to the inserting devices. Fig. 23 is a similarly enlarged front view thereof, also showing a section across said chute. Fig. 24 is a perspective view of a retainer, of the type upon which the machine is designed to operate. Fig. 25 is a vertical sectional detail, showing the spring section of the bottle supporter. Fig. 26 is a horizontal cross-section thereof on the line 26—26 of Fig. 25. Fig. 27 is a transverse vertical sectional view of the neck of a bottle as it appears after the retainer has been inserted therein.

A is the table or base of the machine, made of any desired material and of such thickness as will insure necessary strength. This table is supported upon suitable legs, A', of such length as will raise the operating parts of the machine sufficiently to admit of their being conveniently accessible to an operator standing on the floor.

Power for operating the machine is imparted through the positively driven shaft, B, having bearings in lugs or brackets, b, depending from the under side of the frame or table and driven by the pulley B'. That the machine may be quickly and conveniently started and stopped, the driving pulley and shaft are connected and disconnected by a suitable clutch, so that they can be engaged and disengaged and the machine thus started or stopped by a movement one way or the other of the clutch lever B², in a familiar manner.

At the back of the machine is a stationary, rectangular hopper, C, which contains the fasteners or retainers for supplying the ma-

chine, said hopper being elevated above the frame or table of the machine and supported on posts, *c*. For reasons hereinafter apparent, the hopper is provided in the middle of its bottom with a longitudinal slot, *C'*, the side walls *c' c'* of which are made of some considerable depth, and its bottom is formed by two inclined surfaces, *C²*, sloping toward said middle slot *C'*. For the purpose of additionally strengthening and stiffening said hopper, flanges, formed by downward extensions, *c²*, of the sides of the hopper, and a false bottom, *c³*, connecting said extensions of the sides with the side walls *c' c'* of the slot, are provided.

Oscillating in a vertical plane through the slot in the bottom of the hopper, is a delivering device for taking fasteners from the hopper and delivering them to the expanding or inserting devices arranged in position to be operated upon thereby, said delivering device consisting of a plate *D*, of segmental or approximately triangular form, having on its upper edge a rib or tongue, *d*, so shaped that the central arch of the U-shaped bend of the fastener will fit thereon. As the delivering segment, thus constructed, rises through the mass of loose fasteners or retainers in the hopper, the arches of some of said fasteners will in all cases engage or catch upon the tongue on the segment so as to straddle the tongue and be raised with it. This delivering segment, as it will for convenience hereinafter be termed, is pivoted to a standard, *d²*, at the point *d'* near the apex thereof and with said apex adjacent to the expanding or inserting devices of the machine; the pivotal point being practically on a line with the bottom of the hopper and at such an elevation that the fasteners delivered to the chute, hereinafter described, will descend by their own gravity along said chute to the inserting mechanisms. Vibratory vertical motion is imparted to said delivering segment by means of a cam, *D'*, upon the periphery of which the under surface, *d³* of the delivering segment rests. This cam is carried on a shaft, *D²*, having bearings in lugs or brackets, *d⁴*, depending from the under side of the table or frame of the machine. Said shaft *D²* is actuated from the main driving shaft by a spur gear, *D³*, on the driving shaft, which intermeshes with another spur gear, *D⁴*, secured to and revolving with said driven shaft carrying the cam. It is obvious that the vibrations of the segment can be regulated by changing the relative size of the gears *D³* and *D⁴* on the driving and driven shafts.

The relative sizes of the delivering segment, *D*, and of the cam *D'*, and the relative positions of the hopper, the pivotal point *d'* and the shaft *D²* should be such that when the segment is at its lowest point the upper edge thereof will be flush with the upper edge of the slot in the bottom of the hopper and parallel with the bottom of said hopper, and when at its highest point, the upper edge of

said segment will be so inclined that the fasteners resting thereon will slide by gravity toward the pivotal point *d'*. In order to permit the oscillation of said delivering segment, a vertical slot, *D⁵*, is made in the front wall of the hopper. This slot is closed by means of a gate, *D⁶*, vertically movable in ways, *d⁵*, formed in the said front wall of the hopper. A spring, *d⁶*, serves to hold the lower edge of the gate *D⁶*, in constant contact with the upper edge of the delivering segment *D* and a slot, *d⁷*, is provided in the lower edge of said gate, of such shape and size as to permit the passage through it, one at a time, of the retainers, as they descend along the delivering segment. Thus the front of the hopper is always kept practically closed, while at the same time provision is made to permit the oscillation of the delivering segment and also to permit the passage of retainers therealong. The gate *D⁶* is wider than the delivering segment, and in order that it may follow the segment to the bottom of its stroke, the laterally projecting portions of its lower edge are beveled as at *d⁸* to correspond with the inclination of the bottom of the hopper. The slot in the lower edge of the gate *D⁶* being only large enough to allow the passage of a single retainer at a time, means are provided to prevent other retainers in the hopper from lodging or catching on those retainers which are in proper position, on the rib of the segment, to pass through said slot. The means shown comprise a brush, *E*, pivotally supported from a bracket, *E'*, attached to the inside of the front wall of the hopper, by means of a pin, *e*, bearing in said bracket and loosely fitted to a hole, *e'*, in the block, *E²*, which latter is rigidly secured to the back of the brush.

The front wall of the hopper, upon which the bracket *E'* is supported, is not made integral with the adjacent parts of said hopper, but is loosely fitted thereto and is adapted to move backward and forward longitudinally of said hopper, suitable means, hereinafter described, being provided for giving reciprocatory movement thereto, and such movements serving to actuate the clearing-brush *E*, and also to aid in the passage of the retainers through the front of the hopper.

Projecting laterally from one side of the block *E²* is a pin, *e²*, adapted to engage with the cam surfaces, *e³* and *e⁴*, of a block, *E³*, which is secured to the side of the hopper in proper position. The position of said cam surfaces *e³* and *e⁴* and of the pin *e²* relative thereto, is such that as the brush moves backward, that is to say, toward the rear end of the hopper, the free end of the pin will engage the under surface *e³* of the block *E³* in such manner as to cause the brush to come into contact with those retainers which are entangled with the retainers upon the segment, and thus to swing to one side and at the same time remove the entangled retainers. Just as the brush reaches the rearward limit of its movement the pin passes out of engage-

ment with said cam surface e^3 and the brush is raised out of contact with the upper side of the delivering-segment, and being released swings down of its own gravity. The adjustment of the parts is such that as the brush is at the rearward limit of its movement, the segment D is at the upward limit of its movement. Thus the brush is released just as the segment is at the highest point and when their relative positions are such that as it passes backward over said segment it will as above stated brush off all retainers excepting such as are in position to pass through the slot in the gate. On its forward stroke the pin e^2 engages the upper cam surface e^4 along which it passes until it reaches the forward limit of its movement when it passes out of engagement therewith and swinging down by its own gravity is in position to again engage with the under cam surface e^3 as the brush is again rearwardly moved. This operation is repeated at each vibration of the delivering segment.

The block E^3 on which the cam surfaces e^3 and e^4 are formed, is pivoted at e^5 upon a bracket E^{11} which projects inwardly from one side of the hopper, and on the lower cam surface e^3 a shoulder, e^6 , is formed with which the pin e^2 comes in contact shortly before the brush reaches the rearward limit of its movement and is released. Simultaneously with the pin e^2 striking the shoulder e^6 , the brush comes into contact with a stop, e^7 , adapted to arrest its lateral or radial movement. As a result of this construction the cam-block E^3 is rotated on its pivot against the action of a spring, E^4 , adapted, in combination with a stop formed by a shoulder, e^8 , on said block and a surface, e^9 , of the rigid piece on which said cam block is pivoted, to maintain said cams in proper position to insure the proper engagement of said cams with the pin e^2 . When the pin passes out of engagement with the cam, e^3 , the spring E^4 forces the cam block E^2 downward into its usual position, thus insuring the engagement of the pin e^2 with the upper surface e^4 on the return stroke of the brush and the desired operation of the parts.

Reciprocatory movement is imparted to the loose front end of the hopper from the shaft D^2 in the following manner: The said movable end wall of the hopper rests upon the bottom thereof and has cylindrical standards, E^5 , projecting forward through circular guide holes in a guide plate E^6 . These standards also act as links and are connected with levers, E^7 , which are securely attached to the pivoted bar, E^8 , bearing in the upright brackets, e^{10} . At one end of this pivoted bar is secured in any suitable manner, one end of a lever, E^9 , the other end of which is connected with a crank-arm E^{10} , upon the shaft D^2 by a link e^{11} . It is obvious from the relation of the various parts above described that each revolution of the shaft D^2 will cause the loose front wall of the hopper and the brush carried thereon to vibrate forward and back, and

will thus, as above stated, properly actuate the clearing-brush, and also aid in the proper discharge of the retainers through the front of the hopper.

As the fasteners carried on the delivery segment descend along said segment they are discharged into a chute, F, at the upper end of which said segment is pivoted in such manner as to insure the free passage of the fasteners from the segment to the chute, the rear end of said chute being supported upon a standard, d^2 . The fasteners descend along this chute to the inserting mechanism by the action of gravity. Said chute is formed of a part or bar, F' , the external surface of which is of inverted U-shape, in cross-section, and over which the arches of the fasteners pass, said bar having flanges, f , at the bottom thereof and at right angles thereto, on which the ends of said fasteners rest. Said fasteners are prevented from falling or being thrown from said chute by guards, f' , preferably made of strips of light metal bent at right angles or into approximately U-form and secured to the outer edges of the flanges, f , so that with said flanges they will form a groove into which the outer ends of the retainers will extend when their arches are properly adjusted to the arch of the chute, thus rendering it impossible to remove a fastener or retainer from said chute during its passage along the same. Near the lower end of the chute and so placed or adjusted that it will strike the tops of the fasteners in the chute, as they pass under it, is a revoluble brush, F^2 , carried on a short shaft, f^3 , having a vertically adjustable bearing on a bracket, f^2 , secured to the top of the machine table or frame. On the other end of this shaft is a pulley, f^4 , driven by a crossed belt from another pulley f^5 , secured to the shaft, D^2 , so as to revolve therewith. Having descended by their own gravity along the chute, when they come within the influence of the revolving brush, the fasteners are by it pushed along to the lower end of the chute and to the inserting devices.

In order that the operation of those parts of the machine which are more immediately concerned in the inserting of the retainer, and now to be described, may be more readily understood, I have shown in Fig. 24, a fastener of the kind which the machine is intended to operate upon. A indicates such fastener, the same having a central arch, a , and flat outwardly and laterally projecting end portions, a' , a' , which are adapted to engage the groove in the bottle neck by the spreading apart or expansion of the sides of the arch. The said arch is provided with a central longitudinal slot, a^2 , parallel with the sides of the retainer, and the ends of which are located near the end portions a' , a' of the retainer, so that the arch may be expanded by means engaging the ends of the slot and pressing outwardly against the same.

The inserting mechanisms are all supported upon an upright frame formed by standards, G, united at its base to a bracket, G', depending from the under side of said main frame.

5 Sliding vertically in ways or guides, g, on said frame is a cross-head, G², held normally at its upward limit of movement by means of coiled springs, g', which are compressed as the cross-head descends and which in expanding

10 ing again restores the cross-head to its raised position. This cross-head is actuated by a lever G³, pivotally supported between its ends at the top of a post or pillar, G⁴, secured to the main frame or table of the machine. The

15 rear end of this lever is connected by a link, G⁵, with the forward end of the lever, G⁶, pivotally supported at g² on a bracket, g³, depending from the under side of the main frame of the machine, the rearward extension

20 of said lever G⁶ being so located as to be acted upon by a cam, G⁷, securely attached to the main driving shaft B and revolving therewith. It is thus evident that at each revolution of the shaft B the rearward end of the lever

25 G⁶ will be depressed by contact of the cam G⁷ therewith and, through the intermediate connection described, the forward end of the lever G³, will also be depressed.

Pivotally supported upon the cross-head G²

30 at h, so as to move up and down therewith, are levers, H. The lower ends of these levers are held normally together by means of a spring, h', interposed between said levers above their pivotal points. Jaws or nippers

35 h², are formed on the lower ends of these levers which, when said levers are in their closed position, are adapted to enter the slot of a retainer supported in proper position thereunder, and to engage the shoulders at the

40 ends of the slot of the retainer with sufficient force to secure said retainer in position upon said jaws, so that it will be supported thereupon, when its lateral supports are withdrawn. These levers are maintained in proper position

45 to secure their intended operation by means of guide-bars, H', secured to the face of a plate, H², said plates being provided with guide slots through which said levers play, enough room also being left between the ends

50 of the slots and the levers to permit of the outward movement of said levers necessary to expand said retainer so carried on the jaws h². When the jaws or nippers h² have entered the slot of the retainer so that it will be held thereon, the retainer is released, as hereinafter described, and is carried downward with

55 said levers into the neck of the bottle or other vessel in which it is to be inserted and which is supported in proper position thereunder.

60 When the fastener has been carried down to a point where the ends of said retainer are opposite the internal annular groove in the neck of said bottle or other vessel, the jaws h² are forced positively apart so as to expand the retainer, by means as follows: A cam, H³, is fitted to a slot, h³, formed between off-set

65 portions, h⁴, of the levers H. The cam H³ has

a central pivotal shank, h⁵, bearing in the plate H² and projecting rearwardly through said plate. Rigidly secured to the other end of the shank h⁵ is a lever, H⁴, the free end of which is engaged by the front end of a lever, H⁵, pivoted between its ends to the pillar G⁴. The rear end of this lever is connected by means of a link, H⁶, with the forward end of a lever, H⁷, the rear end of which is so adjusted as to be depressed by a cam, H⁸, secured to and revoluble with the main driving shaft B. The adjustment of the various parts is such that the cam H⁸ will depress the lever

70 and thus rotate the cam H³ when the ends of the retainer in the jaws h² are opposite the annular groove in the neck of the bottle. The shape of the cam H³ is such that as it turns, it will force the levers H equal distances in opposite directions. A spring, H⁹, acting upon the lever H⁴ serves to return the cam H³ into position so that the levers H may come together as soon as the cam passes out of engagement with the lever H⁷. The degree

75 of separation of the jaws or nippers will be such that the ends of the fastener or retainer carried thereon will be expanded or forced apart, and thereby caused to enter the annular groove in the neck of the bottle. The various parts of the inserting devices are so adjusted that this expansion shall take place at the lowest point of the stroke of the cross-head and just before the nippers are withdrawn or retracted to their normal position. As said

80 cross-head and levers are raised by the action of the springs g' the shoulders h⁴ at the bottom of the slot formed by the off-sets in said levers, come into contact with the lower surface of the cam H³, the relative positions of which determine the limit of upward motion, which need be such as to raise the levers only sufficiently to allow a fastener to pass below them into position to be engaged thereby at the next operation of the machine. As the

85 fasteners in the chute are forced forward by the brush F² the foremost fastener will be pushed out of the chute and the end thereof inserted into the slots i in the jaws I; said fastener being forced outward until its outer edge strikes against the plate i' by which its further advance is prevented; said fastener being then in position to be engaged by the inserting mechanisms. The jaws I are movable laterally in guide ways formed between the face of the plate H² and the plate i', said latter plate being supported in position by its ends i², which are turned forwardly at right angles, and attached to the edges of the plate H². In their movement in and out in said

90 guide-way, said jaws rest upon the plate i', secured to the lower edge of the plate H², and hereinafter fully described; said plate i' acting also as a stop to arrest the upward movement of the bottles and to support them in proper position to be operated upon. The middle portion of said plate i', is cut away sufficiently to permit the unobstructed downward passage of the inserting levers

and fasteners carried thereon, also as herein-
after described. For actuating the sliding
jaws I I, levers, I', I', are pivoted upon the
front of the upper guide bar and have their
lower ends connected with the slotted, sup-
porting jaws by means of studs, i^8, i^8 , passing
through slots, i^9, i^9 , in the lower ends of the
levers and secured in plates, I², I², which are
attached to the top surfaces of the said sup-
porting jaws.

The jaws I I are held normally at the inner
limit of their movement by means of the coiled
springs i^4 , (see Fig. 17) their inward position
being determined by the screws i^5 threaded
into the outer ends of said jaws and passing
through the end walls i^2 of the guide ways,
the heads of said screws being adapted to
strike against said end walls of said guide
ways and to arrest their inward movement.
The extent of their inward movement may
be adjusted within certain limits by turning
the said screw i^5 in or out. Said screws also
form guides for the coiled springs i^4 . The
inward or normal position of the jaws is that
at which they are located when in proper posi-
tion to receive fasteners from the chute and
hold them in position for engagement with
the inserting levers. For operating the levers
I' I' to move the sliding jaws, a pin i^6 is in-
serted in the cross-head so as to project for-
ward between the inserting levers H and into
the plane of the said levers I' I' and the lat-
ter levers are crossed at their pivotal points
and provided at their upper ends with bevel-
ed surfaces i^7, i^7 , adapted for engagement
with the pin i^6 as the latter is moved verti-
cally downward with the cross-head; the ac-
tion of the pin on said beveled surfaces being
to thrust the upper ends of the levers I' I' out-
wardly and thereby move the lower ends of the
same outwardly; such outward movement of
the lower ends of the levers arising from the
fact that the same are crossed, as described.

Working in the slot j at the back of the
plate H² and pivotally attached to one post
of the standard G, is the lever J, which is held
normally with its inner end elevated by means
of a catch or stop j' , and which is so situated
that it may be lowered by hand into the path
of the retainers in the chute by force applied
to the outer end thereof and thus prevent the
delivery of fasteners to the slots in the sup-
porting blocks whenever it is desired to stop
the forward movement of the retainers. Dur-
ing the process of insertion the bottle rests
upon a support, K, on which it is raised till
its top strikes the under surface of the plate
l', which is the position of the bottle for the
insertion therein of a fastener or retainer by
the machine. This support consists of a hori-
zontal plate, k , having a semicircular vertical
flange, k' , thereon, which indicates the proper
position on said support for the bottle to be
operated upon. This support is carried upon
the top of a vertical rod, K', passing through
a guide hole, k^2 , in the bracket table, K².
This rod is fitted within the bore, k^3 of the

sleeve K³, in which it is free to move up and
down, and is supported by a coiled spring,
K⁴, resting on top of the sleeve K³ and retained
in position by means of a collar, k^4 , which is
secured to the supporting rod by a set screw,
and by means of which the support for the
bottle may be raised or lowered relatively to
the sleeve. At the top of the sleeve are stop-
screws, k^5 , which limit the play of the sup-
porting rod relatively to the sleeve; said stop
screws being adapted to strike the shoulders
or head k^6 , formed on the lower end of said
supporting rod. The sleeve K³ is screwed
into the upper end of a link K¹⁴, and is con-
nected by means of the said link, K¹⁴, with the
pedal, K⁵, pivotally supported at k^7 , by the
rod k^6 . This rod bears in the bars K⁶ secured
to the legs of the machine. It is thus obvious
that as a bottle carried on the supporter is
caused to strike against the plate l' by the
appropriate movement of the pedal, a yield-
ing contact is obtained, which is very desir-
able.

In order to secure the proper operation of
the inserting mechanisms, it is essential that
the mouth of the bottle, into which the re-
tainer is to be inserted, shall be held centrally
beneath the inserting levers. To effect this
a centering device is provided. This device
consists, as herein shown, of two jaws, L, lat-
erally movable in horizontal ways, l , formed
by the downwardly and inwardly turned edges
of the plate, l', which is secured to the under
surface of the plate H²; said plate l' being
provided with a suitable hole to permit the
passage of the inserting levers and said jaws
being provided with symmetrical, upwardly
tapering, semi-circular recesses, L', in their
lower surfaces and adjacent sides, adapted to
form an upwardly tapering recess, circular
in cross-section when the jaws are closed.
The jaws are held normally with their adja-
cent sides together by means of springs, L²,
located between the outer ends of the jaws L
and plates l² secured to the standards G;
said springs being maintained in position by
means of guide pins, l³, secured in the plates
l². Pins, l⁴, one secured in the side of each
jaw adjacent to the standards G, engage slots,
l⁵, formed in a plate, L³, pivotally supported
in the base of the standards G by means of a
pivot shank, l⁶. The relation of the pins l⁴
and the slots l⁵ is such that rotary movement
of said plate will cause said jaws L to move
equal distances in opposite directions and
such also that a lateral movement of either
of said jaws will rotate said plate. It is thus
evident that a movement of either of said
jaws L will produce an equal movement of the
other jaw in the opposite direction. Thus,
whether together or separated, said jaws will
operate as a centering device to bring the
mouths of the bottles in proper position rela-
tive to the inserting jaws. It is also obvi-
ous that the machine is by this construction
adapted to operate upon bottles the mouths
of which are of different sizes.

As each operation of the levers H expands a retainer, it is desirable in order to prevent waste of retainers, that said levers shall operate only when a bottle is in position to receive a retainer. To prevent the operation of the inserting device under these circumstances, means are provided as follows: The lever G^3 , instead of bearing directly upon the cross-head G^2 , rests upon the head of a pin, m , fitted to and vertically movable in a hole, m' , in said cross-head. A spring, m^2 bearing upward against a nut m^3 on the upper end of said pin m serves to keep it normally at the upward limit of its movement, and said lever is held in place upon the head of said pin by means of projections, m^4 , extending upward from the top of the cross-head, one on each side of said lever. A horizontal slot or groove, m^5 , is formed in the cross-head just below the lower end of the pin m , when both said pin and cross-head are at the upward limit of their movement, said slot or groove intersecting the hole m' in which the pin m slides. Fitted loosely to this slot and pivoted to the cross-head at one end is a bar or lever M, (see Figs. 18 and 19) which is adapted to be moved into and out of the path of the pin m . A spring, m^6 , tends to maintain the bar M in position to engage the lower end of said pin m , but this tendency of the spring is overcome by a catch, m^7 , formed on the lever M' , which is pivoted at its lower end to one of the standards G, as shown; said standard being recessed to make room for said lever. A spring, m^8 , holds the lever M' at the outward limit of its movement, which position is determined by the relative positions of the end of the bar M and the adjacent edge of the lever M' . This outward position is such that the catch m^7 will project beyond the adjacent end of the bar M. From the construction shown it is obvious that when the lever M' is sufficiently retracted to release the bar M, the spring m^6 , will force said bar into position to arrest the downward movement of the pin m so that the further movement of said pin will operate to depress the cross-head G^2 . The catch m^7 forms an upwardly and rearwardly inclined cam surface, and is of such length and is so located that when the cross-head is fully depressed the upper surface of the bar M will be below the lower end of said catch. The relative positions of the catch m^7 and of the surface m^9 of the bar M are such that when the cross head is at the lower limit of its movement and said catch in its normal position, the lower edge of the cam surface forming said catch will be in position to engage the surface m^9 of the bar M; thus, as the cross-head rises, the cam surface forming the head will operate to retract the bar M out of the path of the pin m , and further operation of the driving devices will produce no other result than depressing the pin m in the hole m' until the bar M is again released. The release of the bar M so as to again engage the pin m at the proper time, and of the lever M'

on which the catch m^7 is formed so that it will be in position to retract the bar M as the cross-head rises, is effected in the following manner. Pivottally connected with the lever M' is a link, M^2 , which passes through a guide slot, m^{10} , formed in the standard G, to which the lever M' is pivoted. The vertical arm of a bell-crank, M^3 , pivoted to a lug on said standard G is connected with the free end of the link M^2 by a tripping connection, said link and lever being held in engagement by means of a spring, M^4 . The horizontal end of said bell crank is connected by means of a link, M^5 , with the outer end of a lever, M^6 , pivoted between its ends to the lower end of the standard G in such manner that the free end thereof will project into the circular recess L' formed in the lower surfaces of the centering jaws L, so as to be engaged and raised by the top of a bottle as it is being placed in said machine. As shown in the drawings, the lever M^6 is pivoted to the side of a groove or recess, g^4 , formed in the standard G, so that it will be out of the way of the other operating parts. When opposite the center of the centering recess, the end of the said lever is turned at right angles thereto bringing it in position to be operated upon by the bottle in the manner described. The jaws, ways and standard are cut away to permit the operation of said lever. The position of the lever M^6 and the parts actuated thereby will be such that shortly before said lever reaches its upward limit of movement, the catch m^7 will be sufficiently retracted to release the bar M, and such also that after said bar has been released and just as, or just before, said lever reaches its said upward limit of movement, the connection between the link M^2 and the bell crank M^3 will be tripped allowing the catch m^7 to be returned to position to engage the bar M as the cross-head rises. A spring, M^7 , serves to hold the inner end of the lever M^6 normally depressed and also to cause the end of the bell crank M^3 to engage the link M^2 , thus maintaining all parts normally in position to secure their desired operation.

To now describe the operation of the inserting devices: it will be assumed that the cross-head is at the upper limit of its stroke and just about to descend and that a retainer is in position in the supporting jaws to be engaged by the inserting levers. A bottle is placed upon the support K and is raised into position to receive a retainer. As it passes upward it strikes the inner end of the lever M^6 , which through the intermediate connections described, retracts the catch lever and releases the bar M, which is forced by the spring m^6 into the path of the descending pin m , thus operating to depress the cross-head. When said cross-head has been depressed so that the nippers on said levers are made to engage the retainer held in the sliding jaws, the pin i^6 on the cross-head comes into contact with the beveled surfaces i^7 at the upper ends of the levers I' thereby forcing said jaws

apart and releasing the retainer. Just as, or slightly before, the inserting levers reach the lower limit of their movement, when the retainers carried thereon are opposite the groove in the neck of the bottle, the cam H^3 is quickly actuated by the connections heretofore described, so as to force said levers apart and expand the retainer. The cross-head is then raised and the bar M retracted by engagement of its end with the cam surface of the catch m^7 ; the lever carrying said catch having tripped its connection with the bell-crank actuating it and having been returned to position for engagement with said bar M by means of the spring m^8 . No further operation of the inserting devices will then take place until the lever M^6 is again released so as to re-engage the bell-crank and the link M^2 .

I claim as my invention—

1. An apparatus for inserting expansible cork retainers, comprising jaws adapted for engagement with the retainers and movable toward and from each other, means for supporting the retainers in position for engagement with the jaws, and means for actuating the jaws to expand the retainers, substantially as described.

2. An apparatus for inserting expansible cork retainers, comprising jaws adapted for engagement with the retainers and movable toward and from each other, laterally movable supports for the retainers adapted to sustain the same in position for engagement with the said jaws, and means for actuating the jaws to expand the retainers, substantially as described.

3. An apparatus for inserting expansible cork retainers, comprising jaws adapted for engagement with the retainers and movable toward and from each other, laterally movable supports for the retainers adapted to sustain the same in position for engagement with the said jaws, means for actuating the jaws to expand the retainers, and means for feeding the retainers to said supports, substantially as described.

4. An apparatus for inserting expansible cork retainers, comprising jaws adapted for engagement with the retainers and movable toward and from each other, laterally movable supports for the retainers and means for actuating the jaws to expand the retainers, said inserting levers being movable vertically with reference to the said supports, substantially as described.

5. An apparatus for inserting expansible retainers, comprising jaws movable toward and from each other, means for holding said jaws normally together, means for supporting the retainers, and means for forcibly spreading apart the jaws to expand the retainers, substantially as described.

6. An apparatus for inserting expansible retainers, comprising jaws movable horizontally toward and from each other, a spring applied to hold said jaws normally together, horizontally operating means for supporting

the retainers, and means for forcibly spreading apart said jaws to expand the retainers, substantially as described.

7. An apparatus for inserting expansible cork retainers, comprising jaws movable horizontally toward and from each other, means for holding said jaws normally together, horizontally operating means for supporting the retainers, means for forcibly spreading apart said jaws to expand the retainers, and a support for the bottles into which the retainers are to be inserted, substantially as described.

8. An apparatus for inserting expansible cork retainers, comprising jaws adapted for engagement with the retainers and movable toward and from each other, means for holding said jaws normally together, laterally movable supports for the retainers, means for actuating said movable supports, and means for forcibly spreading apart the said jaws for expanding the retainers, substantially as described.

9. An apparatus for inserting expansible cork retainers, comprising vertically movable jaws adapted for engagement with the retainers, said jaws being movable toward and from each other, means for holding said jaws normally together, laterally movable supports for the retainers, means for actuating said supports, and means for spreading apart said jaws when the latter are depressed, substantially as described.

10. The combination, with means for supporting the retainers, of vertically movable inserting levers having jaws at their lower ends adapted to engage the retainers, a spring applied to hold the jaws normally together, a pivoted cam adapted to engage the inner surfaces of said jaws to forcibly spread the same apart, and means for actuating said cam, substantially as described.

11. The combination, with vertically reciprocating jaws adapted to engage the retainers, and means for actuating the same, of laterally movable supports for the retainers provided with horizontal slots to engage the retainers, substantially as described.

12. The combination, with vertically reciprocating inserting levers having at their lower ends jaws adapted to engage the retainers, and a vertically movable cross-head carrying said levers, of laterally movable supports for the retainers, and means for actuating the supports embracing pivoted levers connected with the supports, and a part of, or upon, the cross-head adapted to act upon the said levers for moving the same, substantially as described.

13. The combination, with vertically reciprocating inserting levers having at their lower ends jaws to engage the retainers, and a vertically reciprocating cross-head carrying said levers, of laterally movable supports for the retainers, and means for actuating the supports, comprising springs applied to throw the said supports inwardly, pivoted levers connected at their lower ends with the sup-

ports and crossed at their upper parts, and a pin in the cross-head acting on the upper ends of both levers to throw the same apart, substantially as described.

14. The combination, with jaws for engaging the retainers, movable toward and from each other, and means for actuating the jaws, of laterally movable slotted supports for the retainers, a chute leading to said supports, and feed devices for supplying retainers to said chute, substantially as described.

15. The combination, with jaws for engaging the retainers, movable toward and from each other, and means for actuating the jaws, of laterally movable slotted supports for the retainers, a chute leading to said supports, feed devices for supplying retainers to said chute, and a stop to limit the advance movement of the retainers, located in position to arrest the same when beneath the jaws, substantially as described.

16. The combination, with jaws for engaging the retainers, movable toward and from each other, and means for actuating the jaws, of laterally movable slotted supports for the retainers, a chute leading to said supports, feed devices for supplying retainers to said chute, a revolving brush acting on the retainers in the chute, and a stop to limit the advance movement of the retainers, substantially as described.

17. The combination, with an inserting mechanism comprising jaws adapted to engage the retainers and movable toward and from each other, and means for supporting the retainers in position for engagement with the jaws, of a hopper for the retainers, a chute leading from the hopper to the inserting mechanism, and means for delivering the retainers from the hopper to the chute, substantially as described.

18. The combination, with inserting mechanism and a hopper, of a chute leading from the hopper for retainers to the inserting mechanism, and a movable stop adapted to be thrown into the path of the retainers to prevent their passage along the chute, substantially as described.

19. The combination, with a hopper having a slot in its bottom, of a chute and an oscillatory delivering segment moving up and down in the slot, and having its upper edge continuous with the chute, and means for actuating said segment, substantially as described.

20. The combination, with a hopper for retainers having a slot in its bottom, and a chute, of an oscillating segment moving in said slot, and means preventing the passage of more than one retainer at a time to the chute, substantially as described.

21. The combination, with a hopper having a slot in its bottom, of an oscillatory delivering segment moving in said slot, a vertically movable gate located over the said segment and having a slot in its lower edge adapted to allow the passage of retainers one at a time

along the delivering segment to the chute, substantially as described.

22. The combination, with a hopper having a slot in its bottom, and an oscillatory delivering segment in said slot, of a laterally movable brush for removing surplus retainers from the segment, substantially as described.

23. The combination, with a hopper having a slot in its bottom, of an oscillatory delivering segment moving in said slot, and a vertically movable gate located over the said segment and having a slot in its lower edge adapted to allow the passage of retainers one at a time from the delivering segment to the chute, and means for removing surplus retainers from said segment, substantially as described.

24. The combination, with a hopper having a slot in its bottom and an oscillatory delivering segment moving in said slot, of a horizontally movable end wall, a vertically movable gate in said wall over the delivering segment having a slot in its lower edge adapted to allow the passage of retainers one at a time, a brush pivotally supported from said movable wall of the hopper, and means for actuating said brush, substantially as described.

25. The combination, with a hopper having a slot in its bottom and an oscillatory delivering segment moving in said slot, of a horizontally movable end wall having a slot therein to permit the oscillation of said segment, a vertically movable gate adapted to close said slot, a slot in the lower edge of said gate adapted to permit the passage of retainers therethrough one at a time only, a brush pivotally supported upon said movable end wall, a pin projecting laterally from said brush and a cam surface with which said pin is adapted to engage, substantially as described.

26. The combination, with a hopper having a slot in its bottom and a slotted end wall, of an oscillatory delivering segment moving in said slot, a slot in the front wall of the hopper to allow oscillation, a vertically movable gate mounted on the end wall and adapted to close the slot therein, and a spring whereby said gate is held in constant contact with the delivering segment, substantially as described.

27. The combination, with retainer-inserting devices, of driving mechanism therefor embracing means for disconnecting the driving mechanism from the inserting devices after the insertion of each retainer, and means actuated by the insertion of a bottle in the machine for connecting the said driving mechanism with the inserting devices, substantially as described.

28. The combination, with retainer-inserting devices embracing a vertically movable cross-head and a spring for lifting the cross-head, of an actuating device for the cross-head having detachable connection therewith, means for disconnecting the actuating device from the cross-head at each upward movement of said cross-head, and means for effecting the positive engagement of the actu-

ating device with the cross-head when a bottle is inserted in the machine, substantially as described.

29. The combination with retainer-inserting devices embracing a vertically movable cross-head and a spring for lifting the cross-head, of a vertically movable pin in the cross-head, a spring applied to lift the same, a spring actuated bar on the cross-head adapted to be held by the actuating spring in the path of said pin, a retracting mechanism for withdrawing the said bar from the path of the pin in the upward movement of the cross-head, and means for releasing the bar when a bottle is inserted in the machine, embracing a movable part located in position to be engaged and moved by the bottle, substantially as described.

30. The combination, with retainer-inserting devices embracing a vertically movable cross-head and a spring for lifting the cross-head, of a vertically movable pin in the cross-head, a spring lifting the same, an actuating lever bearing on the pin, a spring actuated bar on the cross-head adapted to be held by the actuating spring in the path of said pin, a spring actuated catch on the machine frame provided with an inclined surface for engagement with said bar, and means for actuating said catch to release the bar, embracing a

movable part located in position to be engaged and moved by the bottle, and a tripping device by which the catch is released after having been moved to disengage it from the bar, substantially as described.

31. The combination with vertically movable and horizontally opening and closing retainer-inserting mechanism, of a divided horizontally opening and closing centering device for holding bottles in proper position to receive a retainer from said inserting mechanism, substantially as described.

32. The combination, with the retainer-inserting mechanism and a vertically movable support for the bottle, of means whereby as said bottle or other vessel is raised it is brought into proper position to receive a retainer from the expanding mechanisms, said means comprising laterally movable jaws held normally together and a connection between said jaws affording equal and opposite movement therein, substantially as described.

In testimony that I claim the foregoing as my invention I affix my signature in presence of two witnesses.

ARTHUR J. SANDS.

Witnesses:

C. CLARENCE POOLE,
G. W. HIGGINS, Jr.