No. 687,797. Patented Dec. 3, 1901.

T. L. VALERIUS.

BOTTLE FILLING MACHINE.

(Application filed Dec. 29, 1900.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 2.

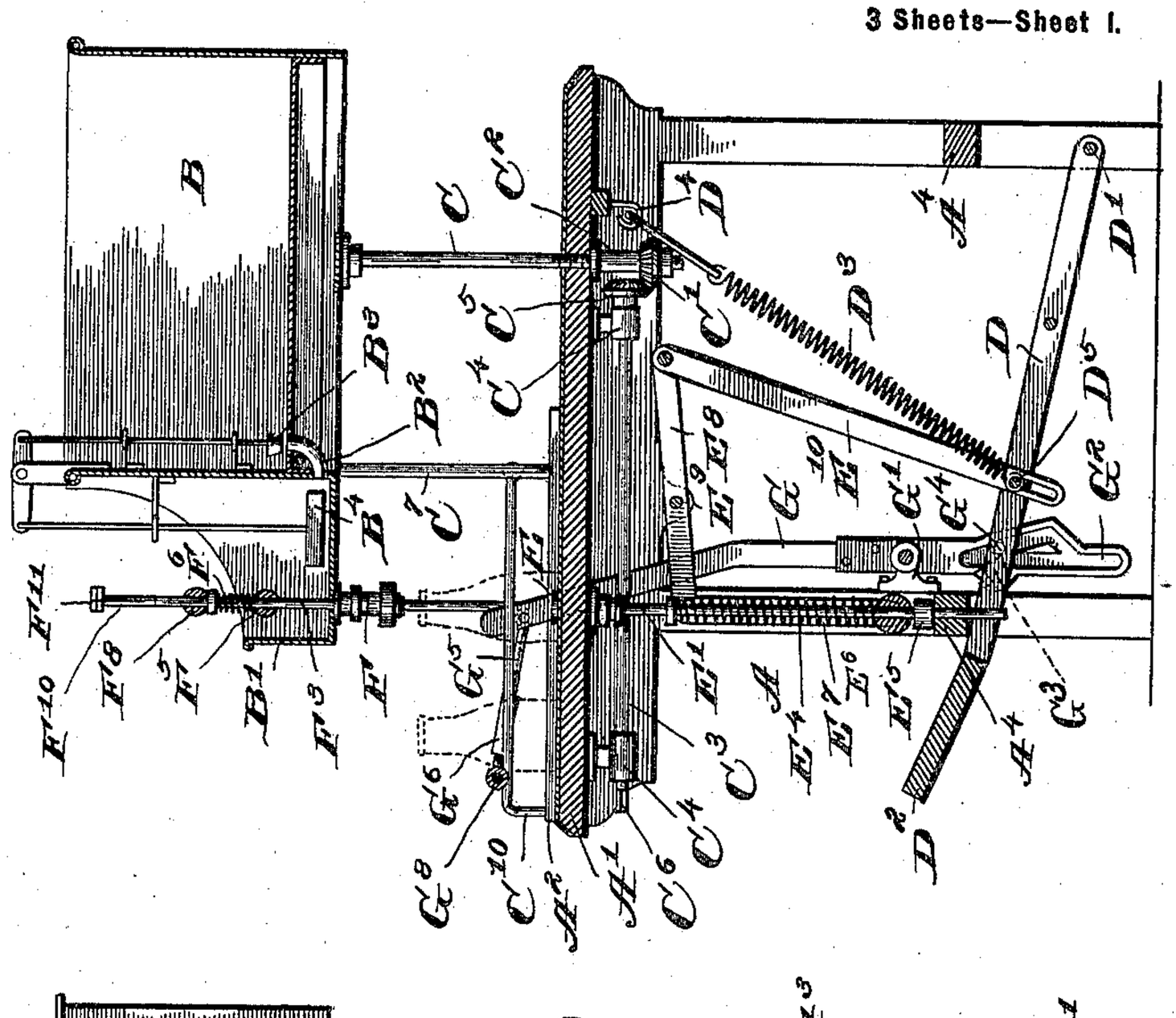
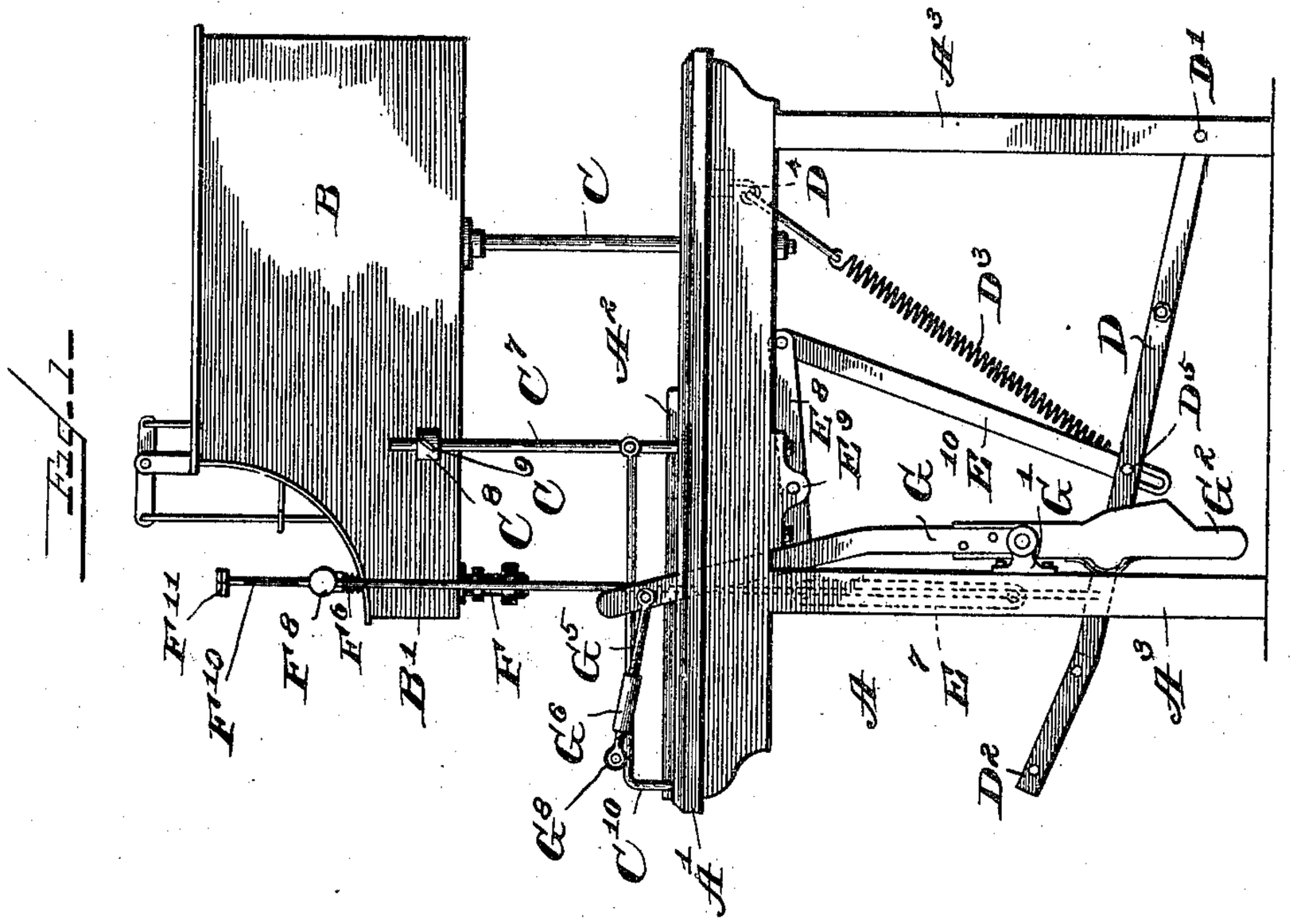


Fig. 1.



Witnesses.

G. A. Pauberschmidt,

Geo. L. Chindahl

Inventor.

Theodore L. Valerius

By Luther L. Weller,

Atty.

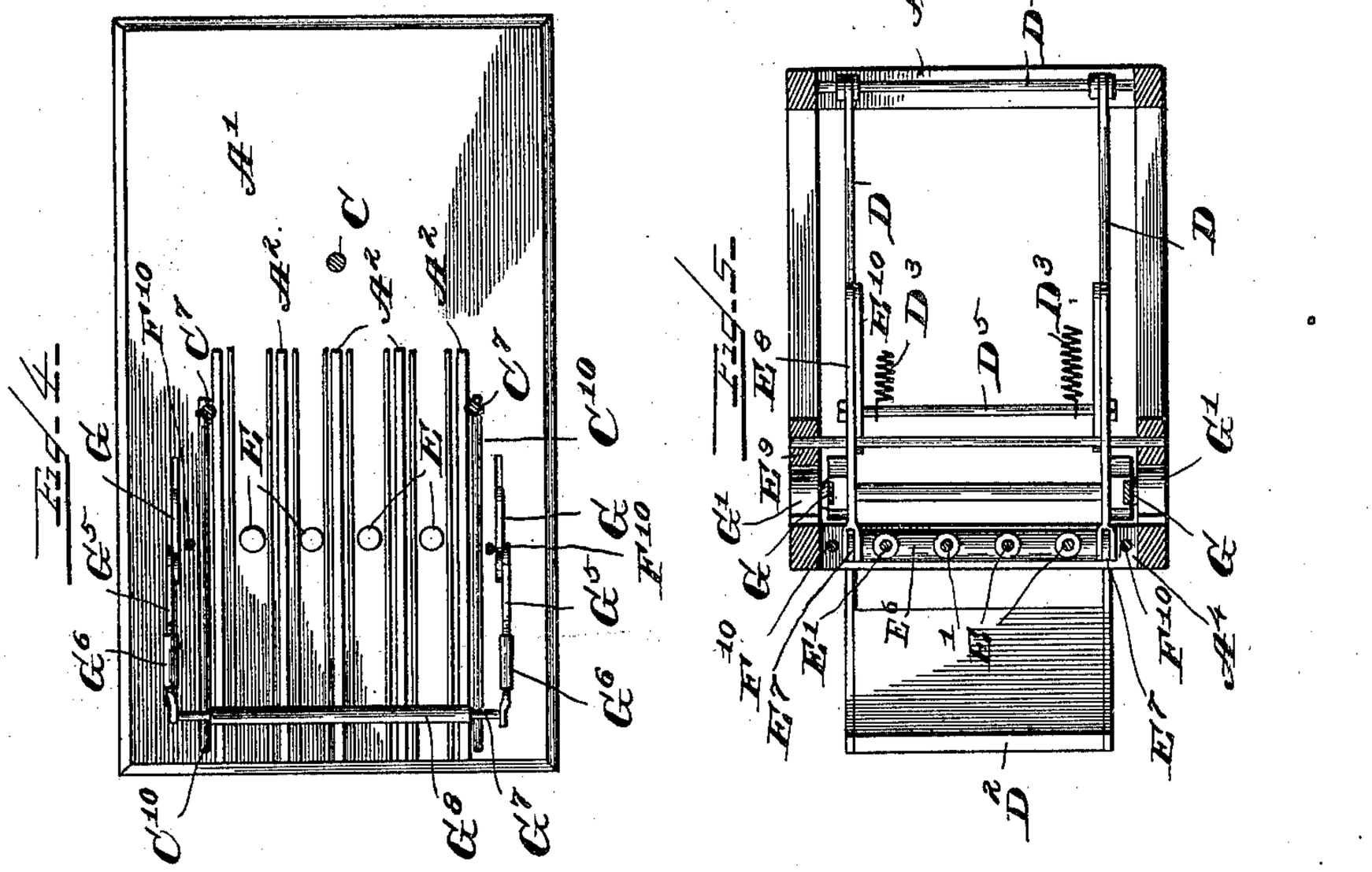
No. 687,797. Patented Dec. 3, 1901.

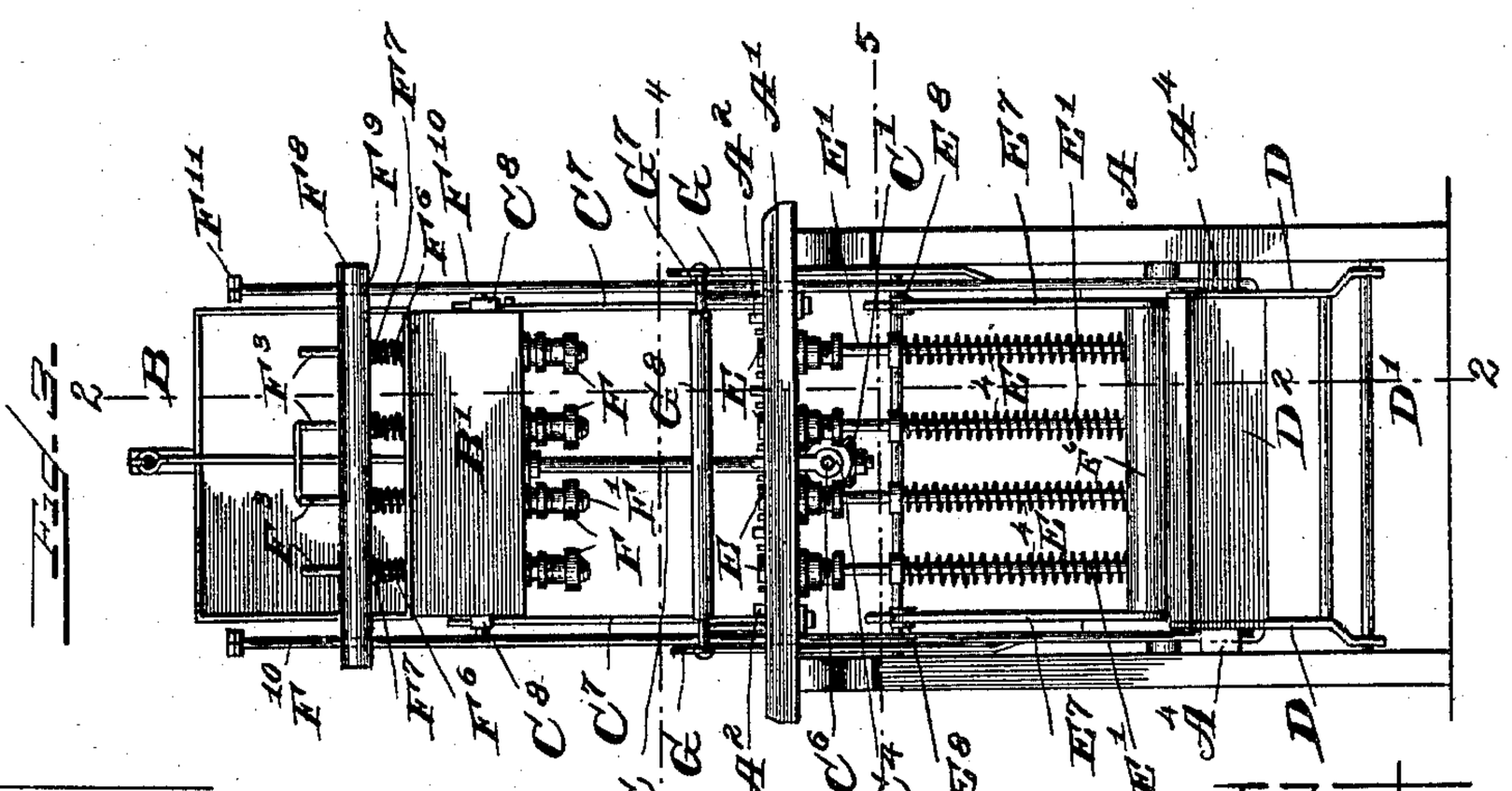
T. L. VALERIUS.

BOTTLE FILLING MACHINE.

(Application filed Dec. 29, 1900.)

(No Model.) 3 Sheets—Sheet 2.





Witnesses

G. A. Tauberschmidt

Geo. L. Chindahl

Inventor

Theodore L. Valerius

By Luther L. Miller

Atty.

No. 687,797. Patented Dec. 3, 1901.

T. L. VALERIUS.

BOTTLE FILLING MACHINE.

(Application filed Dec. 29, 1900.)

(No Model.) 3 Sheets—Sheet 3.

Fig. 6.

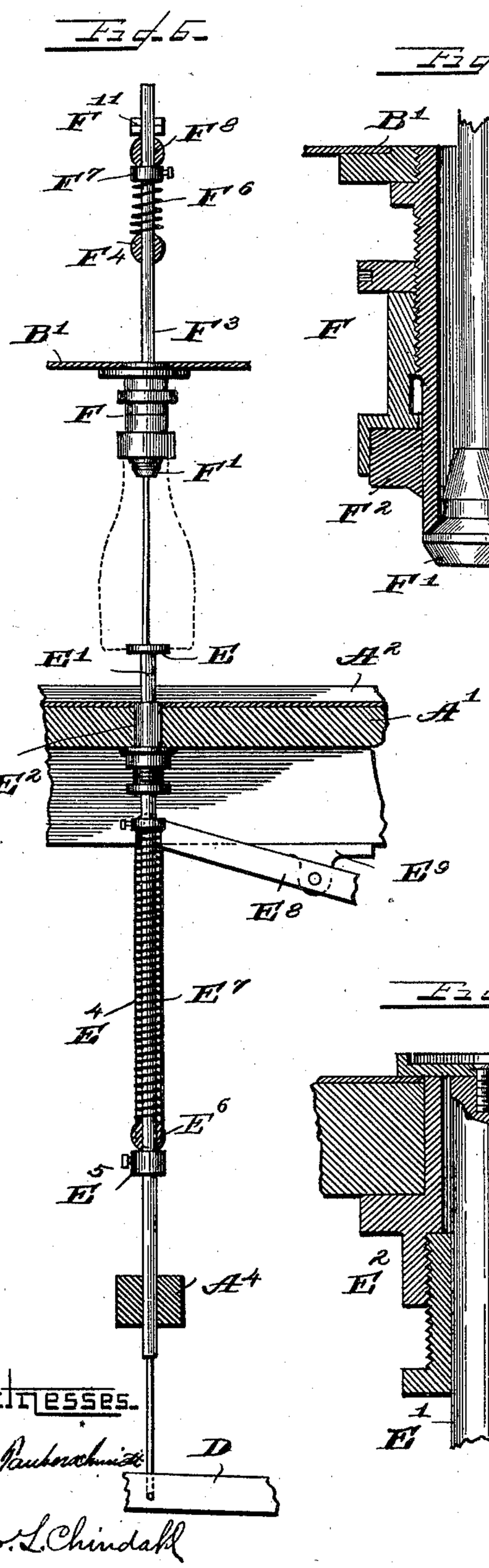


Fig. 8.

Fig. 7.

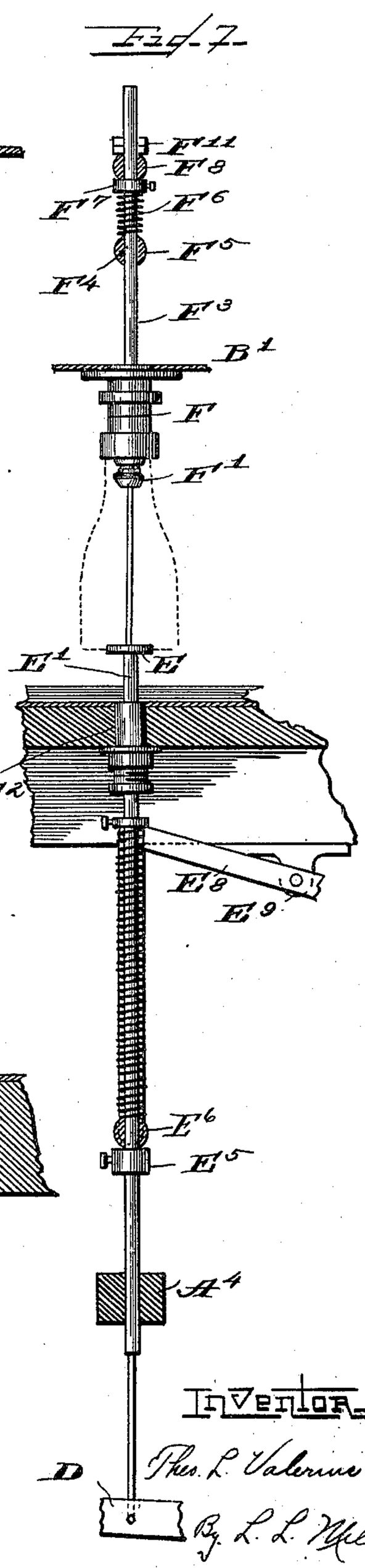


Fig. 9.

Witnesses.
G. A. Paulenschmidt
Geo. L. Chindahl

Inventor.
Thos. L. Valerius
By L. L. Miller.
Atty.

UNITED STATES PATENT OFFICE.

THEODORE L. VALERIUS, OF FORT ATKINSON, WISCONSIN, ASSIGNOR TO THE CREAMERY PACKAGE MANUFACTURING COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

BOTTLE-FILLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 687,797, dated December 3, 1901.

Application filed December 29, 1900. Serial No. 41,480. (No model.)

To all whom it may concern:

Be it known that I, THEODORE L. VALERIUS, a citizen of the United States, residing at Fort Atkinson, in the county of Jefferson and State of Wisconsin, have invented certain new and useful Improvements in Bottle-Filling Machines, of which the following is a specification.

The object of this invention is the production of an improved bottle-filling machine.

In the accompanying drawings, Figure 1 is a side elevation of this bottle-filling machine. Fig. 2 is a vertical section on dotted line 2 2 of Fig. 3. Fig. 3 is a front elevation of the machine. Fig. 4 is a horizontal section on dotted line 4 4 of Fig. 3. Fig. 5 is a similar section on dotted line 5 5 of Fig. 3. Fig. 6 is a detail view of the bottle-elevating mechanism and discharge-spout, showing the bottle in dotted lines. Fig. 7 is a similar view of said mechanism, showing the valve in the discharge-spout opened to admit liquid to the interior of the bottle. Fig. 8 is a vertical central section through said discharge-spout. Fig. 9 is a vertical central section showing the vertical elevator-plunger and its supporting-bearings.

Like letters of reference indicate corresponding parts throughout the several views.

In the production of this bottle-filler I provide a table A, having the top A′ with the bottle-guides A^2 thereon, the supporting-legs A^3, and the horizontal braces A^4 between said legs.

B is a liquid-reservoir mounted above the table-top A′, and B′ is a filler extension thereof forming the forward part of said main reservoir B and communicating therewith by means of the pipe B^2. This pipe B^2 is automatically controlled by the closure B^3 and the float B^4, so that a certain predetermined quantity of liquid in the filler-reservoir B′ is constantly maintained.

C is a rod screw-threaded at its lower end and, extending upward through an opening in the table-top A′, supports the liquid-reservoir over said table. A bevel-gear C′ with a long integral hub C^2, internally screw-threaded to correspond with the threads upon the rod C, provides means for adjusting the height of said reservoir B. A shaft C^3, mounted in the bearings C^4, secured to the under side of the table-top, supports the bevel-gear C^5, meshing with the bevel-gear C′, the forward end of the shaft C^3 being squared at C^6 for the attachment of a suitable crank. (Not shown.) Fixed rods C^7 extend upward from the table-top A′ beside the liquid-reservoir B and are adapted to be clamped thereto by means of the brackets C^8 and the thumb-screws C^9 thereon. Side rails C^{10} extend forward from said fixed rods at each side of the table-top and at their forward ends are secured to said table. Their purpose is to prevent bottles from falling from the table.

Treadle-levers D are pivotally mounted upon the rod D′, extending between the two rear legs A^3 of the table A. These levers extend forward and have between their free ends the treadle D^2. Two extension coil-springs D^3, connected with said treadle-levers and adapted to hold the same elevated, are attached at their upper ends to the hooks D^4, secured to the under side of the table-top A′ and at their lower ends to the rod D^5, extending between said levers D.

Four elevator-disks E project above the table-top A′ between the guides A^2 thereon. These disks are fixed at the upper ends of rods E′, which latter extend downward through their bearing-sleeves E^2 and through openings E^3 in the cross-bar A^4, between the forward legs A^3. Coil-springs E^4 surround said rods and collars E^5 limit the upward movement of said coil-springs. A cross-bar E^6, perforated at suitable intervals to permit the passage of said rods, extends beneath said coil-springs E^4, and the collars E^5 are secured to said rods directly beneath said cross-bar. Links E^7 are pivotally secured at their lower ends to the ends of the cross-bar E^6, and at their upper ends to the levers E^8, pivotally mounted in the bracket E^9, secured to the table A at either side thereof. The opposite end of each of the levers E^8 is connected by means of the link E^{10} with one of the treadle-levers D. The lower ends of the links E^{10} are provided with the elongated openings E^{11}, adapted to receive the rod D^5, extending between the two treadle-levers D.

Several discharge-spouts F are located in the bottom of the filler-reservoir B′, communicating with the interior thereof, one of said discharge-spouts being directly over each of the elevator-disks E. Each discharge-spout is closed by a conical plug F′ and is provided with the rubber packing-ring F^2 at its lower end. This packing-ring is adapted to form a tight joint with the mouth of the bottle when the same is raised by the elevator-disk E into contact with said rings. These plugs are secured at the lower ends of the valve-stems F^3, extending upward through and above the discharge-spouts F, and through suitable openings F^4 in the fixed supporting-bar F^5, within the filler-reservoir B′. These valve-stems F^3 are made tubular, so that air within the bottles being filled may escape through said valve-stems as it is displaced by the inflowing liquid. Above said supporting-bar F^5 the stems F^3 are surrounded by the coil-springs F^6, and above said springs are provided with the collars F^7. Extending across said collars and perforated at suitable intervals to receive the valve-stems F^3 is a cross-bar F^8, having the openings F^9 at its outer ends to receive the vertical rods F^{10}. These rods are provided with the adjustable stops F^{11} at their upper ends, and extending downward have a pivotal connection with the treadle-lever D on each side of the machine.

Two vertical feeder-levers G are pivotally mounted in the bracket G′, secured to the forward leg of the table A. These feeder-levers are each provided near their lower ends with the cam-groove G^2, somewhat of the form of the figure 4. Near the upper angle of these cam-grooves are provided the pivoted switches G^3. A fixed stud G^4 extends outward from each of the treadle-levers D and engages said cam-groove. By reason of the switches G^3 the studs G^4 are directed downward into the inclined portion of the cam-groove, returning upward in the stem portion thereof, opening the switches near the upper part of their movement. At the upper end the feeder-levers G are connected by the pivoted bail G^5, in the side arms of which are provided the adjusting-sleeves G^6, internally threaded with right and left screw-threads to permit of an adjustment of the transverse bar G^7 of said bail for different sizes of bottles. This transverse bar G^7 is provided with a rubber covering G^8, in order that it shall not break the bottles to be filled.

In operation empty bottles are placed upon the table-top A′, near the forward end thereof and within the guides A^2. The liquid to be bottled is placed in the reservoir B, the float B^4 permitting a certain quantity of said liquid to run through the pipe B^2 into the filler-reservoir B′. The foot of the operator is placed upon the treadle D^2 and the treadle-levers D depressed. The first movement of the mechanism is the forward movement of the feeder-levers G, pushing the empty bottles into line directly over the elevator-disks E and then retreating slightly to withdraw the transverse bar G^7 from contact with the bottles. This movement of the feeder-levers G occurs when the studs G^4 descend through the angular portion of the cam-grooves G^2 of said feeder-levers G. When the studs G^4 have reached the lower part of said angular portion of the cam-grooves G^2 and enter the stem portion of said grooves, the rod D^5 has traveled the length of the elongated opening E^{11} in the link E^{10}, and said link is then drawn downward, tilting the lever E^8 upon its pivot and raising the elevator-disks E with the bottles resting upon them. This movement lifts the bottles so that their necks are placed in engagement with the elastic collar F^2 of the discharge-spouts F, holding said bottles tightly in contact with said packing and making a tight joint between the bottles and the discharge-spouts. A continued downward movement of the treadle D^2 causes the rods F^{10} to be drawn downward through their openings F^9 in the ends of the cross-bar F^8 until the adjustable stops F^{11} at the upper ends of said rods F^{10} engage the upper side of said cross-bar. As soon as this occurs a continued depression of said treadle-levers D depresses the cross-bar F^8, compresses the springs F^6, coiled about the valve-stems F^3, and moves the closure-plugs F′ from their seats in the spouts, thus opening said spouts and permitting the liquid within the filler-reservoir to run into the bottles to be filled. As soon as the bottles are filled with liquid the foot of the operator is removed from the treadle D^2, the treadle-levers D are raised by the action of the coil-springs F^6, the closure-plugs F′ seat themselves within the discharge-spouts F, and the supply of liquid is cut off. A continued upward movement of the treadle D^2 permits the elevator-disks E to recede downward, and the filled bottle rests upon the guides A^2 upon the table-top A′. While these bottles were being filled, four empty bottles were placed by the operator within the bail G^5, and a second depression of the treadle D^2 brings said empty bottles forward over the elevator-disks E, to be raised and filled as were the preceding ones, pushing the filled bottles backward in the guides A^2. As empty bottles are pushed forward by the feeder-bail G^5 to be filled the filled bottles are slid along the guides A^2 onto the table-top A′. Here they are capped by an assistant and removed from said table.

To adjust the height of the reservoir B to different sizes of bottles, the shaft C^3 and the bevel-gears C′ and C^5 are rotated. The thread connection between the bevel-gear C′ and its sleeve C^2 with the rod C causes said reservoir to be raised or lowered as said shaft is turned. The set-screw C^9 in the bracket C^8, for engaging the rods C^7 at the sides of the reservoir, rising from the table-top to the reservoir B, must of course be loosened before a change

in the adjustment of the reservoir and tightened again after such adjustment has taken place.

The conical form of the closure-plugs F′ causes the liquid to be injected into the bottles in a thin sheet directed against the inner sides thereof, thus preventing all foaming of the liquid caused by the filling process.

I claim as my invention—

1. In a bottle-filling machine, in combination, a liquid-reservoir; a discharge-spout; a closure therefor; an elevator-disk; a rod for the disk; a lever for raising said disk; a spring between said lever and said rod; a rod for opening the discharge-spout; and a treadle for operating the elevator mechanism and for moving the rod to open the discharge-spout.

2. In a bottle-filling machine, in combination, a liquid-reservoir; a discharge-spout; a closure therefor; an elevator-disk; a rod for the disk; a lever for raising said disk; a spring between said lever and said rod; a rod for opening the discharge-spout; an arm for feeding an empty bottle forward to said elevator-disk; a lever for said arm, said lever being provided with a cam-opening and a cam-groove; and a treadle adapted to engage said cam-groove to operate said feeding-arm, also for operating the elevator mechanism and for moving said rod to open the discharge-spout.

3. In a bottle-filling machine, in combination, a liquid-reservoir; a discharge-spout; a closure therefor; a bottle-elevator; a lever for operating said elevator; an arm for feeding empty bottles to said elevator; a lever having a pivotal connection with said arm, said lever having an endless cam-groove; a treadle; and a stud on said treadle, for engaging said endless cam-groove, said treadle being adapted to operate the bottle-elevator and the closure for the discharge-spout.

4. In a bottle-filling machine, in combination, a liquid-reservoir; a discharge-spout communicating with said reservoir; a bottle-elevator for raising the bottle into engagement with said spout; a treadle for actuating said elevator; an arm in bail form for feeding empty bottles to said elevator; a lever pivotally connected with said arm, said lever having an endless cam-groove; a stud on said treadle, adapted to lie in said cam-groove; a switch in the cam-groove, to direct the course of movement of said stud therein; and means for connecting said treadle with the closure for said discharge-spout.

5. In a bottle-filling machine, in combination, a table; a liquid-reservoir; a discharge-spout communicating with the interior of said liquid-reservoir; a closure for said spout; a rod for supporting said reservoir, said rod extending through the top of said table, and being screw-threaded at its lower end; a bevel-gear screw-threaded to correspond with said rod; means for rotating said gear to adjust the vertical height of said liquid-reservoir over said table; guides for the bottles, on the top of said table; an elevator-disk for the bottles; a rod for said elevator-disk; an arm having a connection with said rod; a foot-treadle for moving the elevator-disk; a pivoted lever connection between said arm and said foot-treadle; a spring for holding said foot-treadle normally elevated; a bottle-feeding arm pivotally mounted on said table, said bottle-feeding arm having a pivotal bail at its upper end for engaging the bottles, and a cam-groove at its lower end; a stud on the foot-treadle for engaging said cam-groove; and a rod for operating the valve for the discharge-spout.

6. In a bottle-filling machine, in combination, a table; a liquid-reservoir supported over said table; a discharge-spout communicating with the interior of said liquid-reservoir; a closure for said spout; bottle-guides on the top of said table; a bottle-elevator disk; a rod for said disk; an arm having connection with said rod; a spring on said rod; a collar at each end of said spring; a cross-bar for the lower end of said spring; an arm pivotally connected with said cross-bar; a foot-treadle for operating said arm; a pivotal lever connection between said foot-treadle and said arm; an arm for feeding the bottles to the elevator, said arm having a cam-groove therein, and having a bail at its upper end, for embracing the bottles; a stud on said foot-treadle, for engaging said cam-groove; and a rod connecting with said foot-treadle, and having a sliding connection with the closure for said discharge-spout, for operating said closure.

THEODORE L. VALERIUS.

Witnesses:
H. H. CURTIS,
BELLE MCMILLEN.