(No Model.) 4 Sheets—Sheet 1.

W. A. BOWIE & E. J. DODD.

APPARATUS FOR FILLING BOTTLES.

No. 564,735. Patented July 28, 1896.

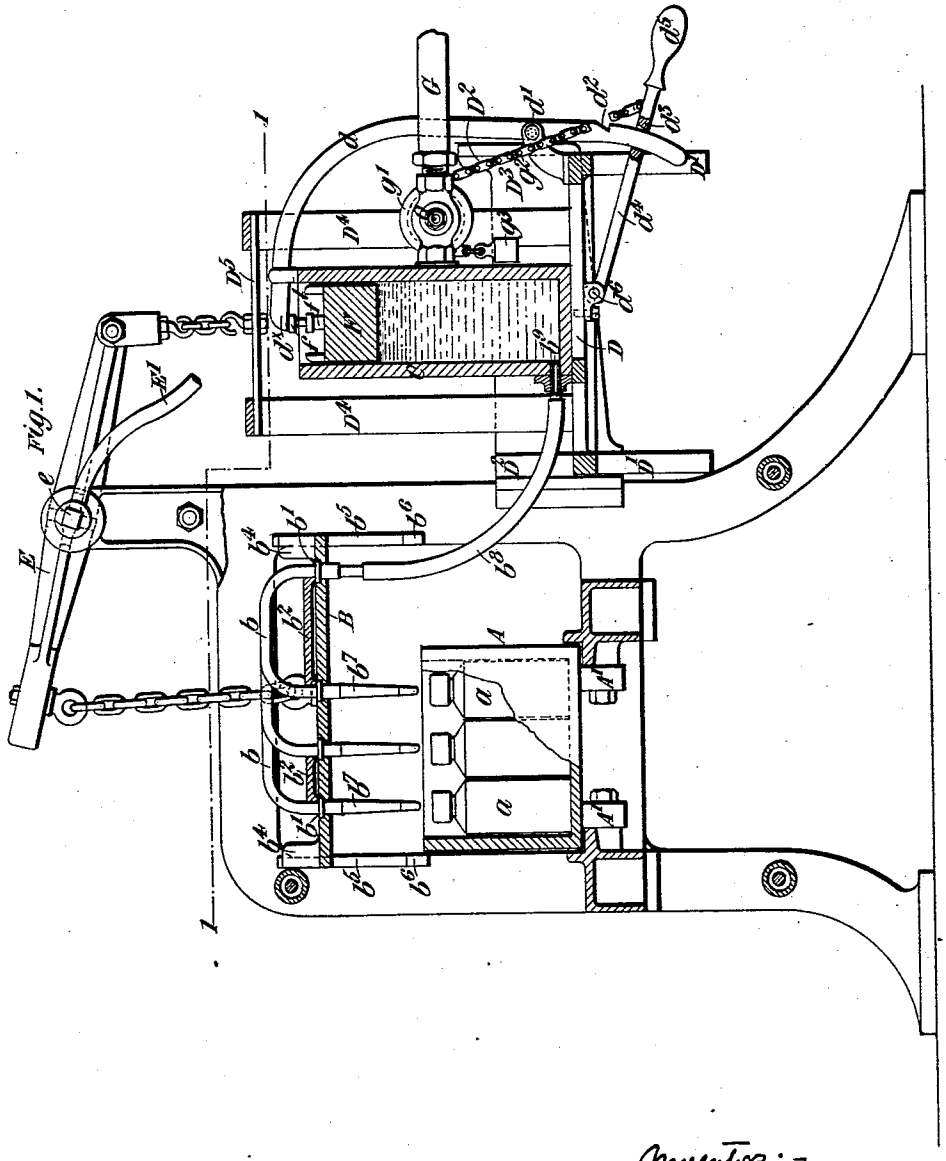

Fig. 1.

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(No Model.) 4 Sheets—Sheet 2.

W. A. BOWIE & E. J. DODD.

APPARATUS FOR FILLING BOTTLES.

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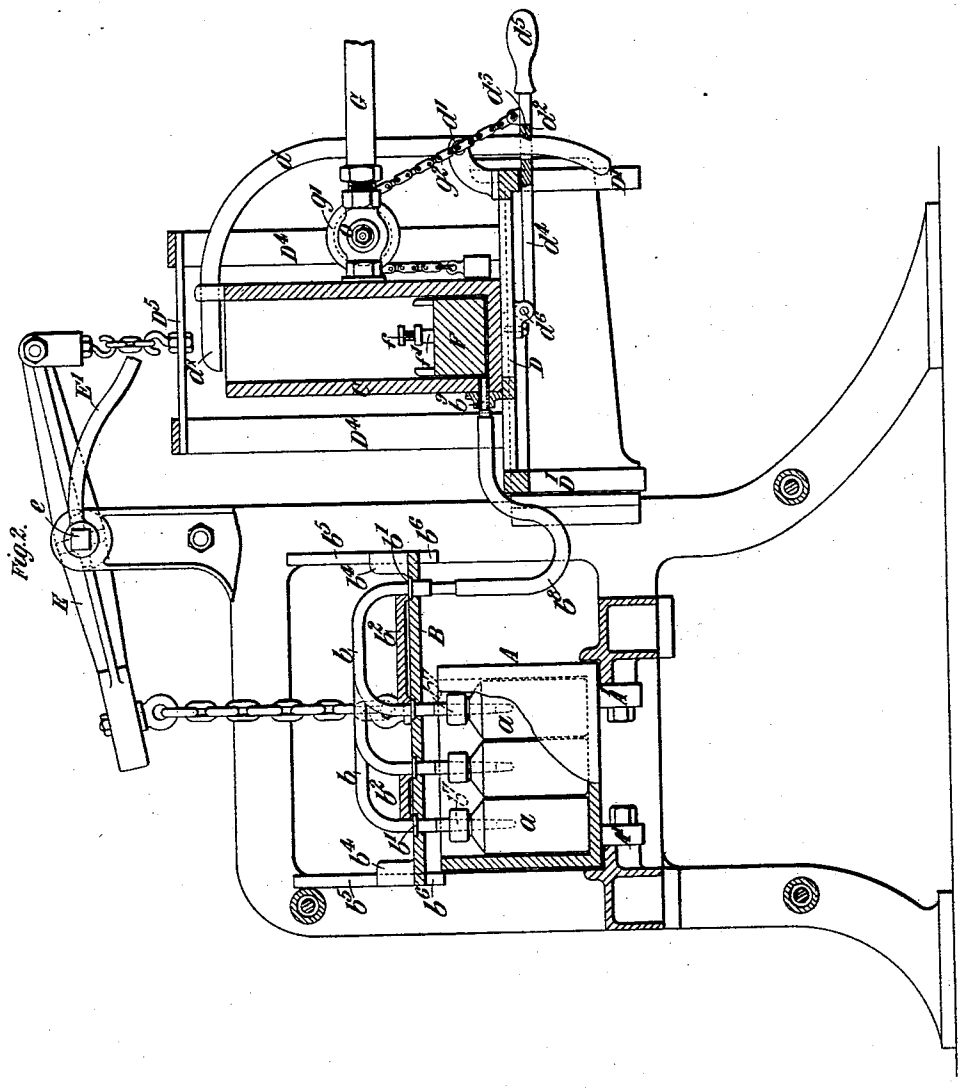

Fig. 2.

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(No Model.) 4 Sheets—Sheet 3.

W. A. BOWIE & E. J. DODD.

APPARATUS FOR FILLING BOTTLES.

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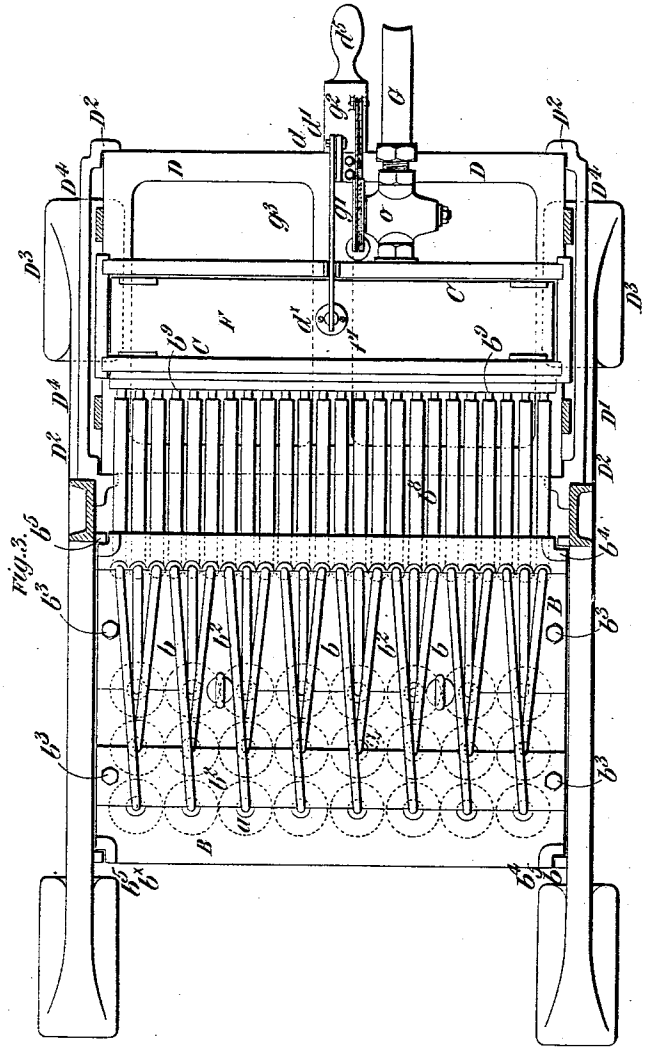

Fig. 3.

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(No Model.) 4 Sheets—Sheet 4.

W. A. BOWIE & E. J. DODD.

APPARATUS FOR FILLING BOTTLES.

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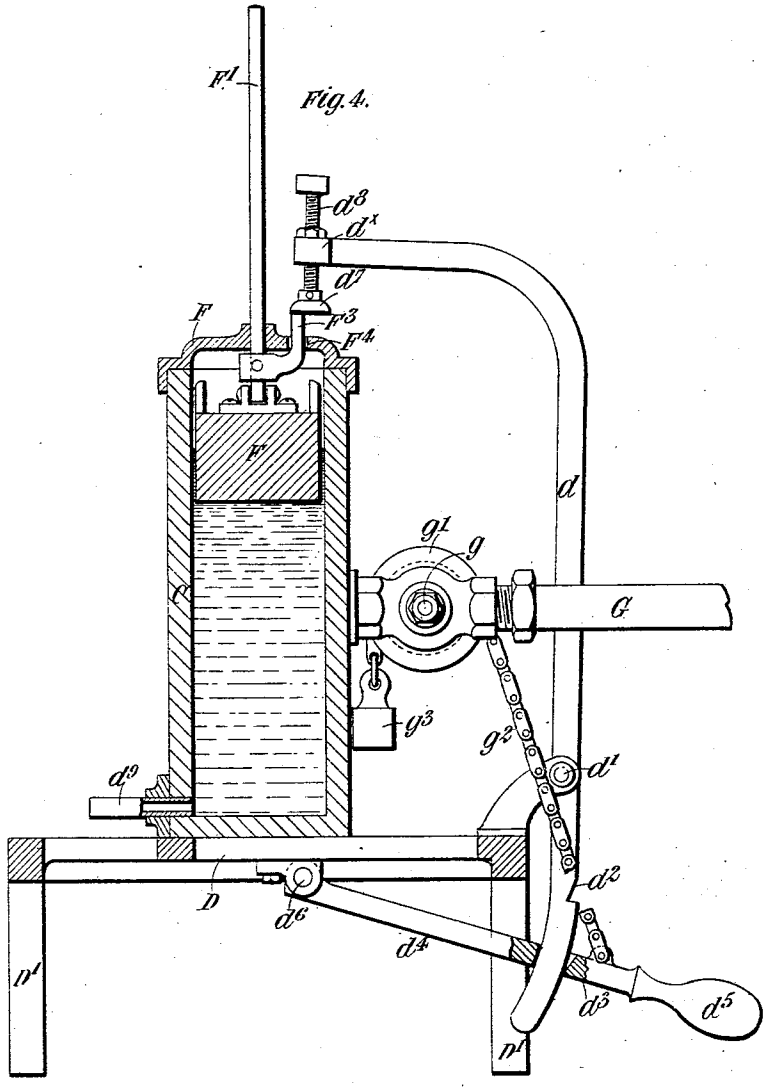
Fig. 4.



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UNITED STATES PATENT OFFICE.

WILLIAM ALEXANDER BOWIE AND ERNEST JAMES DODD, OF LONDON, ENGLAND.

APPARATUS FOR FILLING BOTTLES.

SPECIFICATION forming part of Letters Patent No. 564,735, dated July 28, 1896.

Application filed December 30, 1895. Serial No. 573,763. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM ALEXANDER BOWIE, gentleman, of 14 Tierney Road, Streatham Hill, London, Surrey, and ERNEST JAMES DODD, gentleman, of 2 Eveline Villas, Leicester Road, New Barnet, London, Middlesex, England, subjects of the Queen of Great Britain, have invented certain new and useful Improvements in Apparatus for Filling Bottles and other Receptacles with Liquids, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to bottle-filling apparatus of the kind wherein the bottles or other vessels to be filled are arranged on a tray which can be elevated to bring a series of siphon-tubes communicating with a liquid-reservoir into the mouths of the bottles, the elevation of the said tray simultaneously starting the filling operation by causing a weight or displacer to be immersed in the liquid contained in the aforesaid liquid-tank.

According to our invention we avoid the necessity of elevating the bottles or other vessels to be filled, and instead of immersing a weight or displacer to start the filling operation we depress the filling or siphon tubes a sufficient distance below the level of the liquid in the liquid-tank to start the flow of the liquid into the bottles by the action of gravity. We also provide means whereby the entrance of liquid to the aforesaid tank and the quantity of liquid supplied to the bottles are mechanically controlled, as will be hereinafter explained.

In the accompanying drawings we have illustrated an apparatus or machine embodying our improvements.

Figure 1 is a longitudinal section showing the position the parts occupy prior to a filling operation. Fig. 2 is a similar section, but showing the position the parts occupy after a filling operation. Fig. 3 is a horizontal section taken on the line 1 1 of Fig. 1. Fig. 4 is a fragmentary view showing a modified arrangement of the means for controlling the liquid supply to the tank.

a a are the bottles to be filled, which are situated in a receptacle or tray A, that is adapted to be slid into and out of the machine on rollers A′ A′.

b b are the filling or siphon tubes, mounted in a movable tube-plate B, and C is the liquid-tank, which is carried by a movable platform or frame D. The aforesaid tube-plate B and frame D are suspended by chains from the opposite ends of a rocking arm or beam E, which is pivoted at *e* in the upper portion of the framing of the machine. This beam is capable of being rocked by means of a hand-lever E′, a part of which has been broken away in the drawings in order to avoid confusion.

The tube-plate B consists of a metal plate having a series of apertures therein for the reception of the filling or siphon tubes, which are furnished with collars *b*′, that rest upon shoulders formed within the aforesaid apertures. These filling or siphon tubes are retained in place by means of metal strips or bars b^2, affixed to the upper surface of the tube-plate by screws b^3. The corners of the tube-plate are formed with lugs b^4, which engage with guide-strips b^5 b^5 on the framing of the machine, so as to guide the said tube-plate during its ascending and descending movements.

b^6 b^6 are stops with which the guide-strips b^5 are furnished to limit the descent of the tube-plate.

The filling or siphon tubes are provided with nozzles b^7, which enter the bottles or other vessels when the filling operation takes place, and the opposite ends of the said filling or siphon tubes are connected by flexible pipes b^8 to a series of short tubes b^9, projecting from the lower part of the liquid-tank C. The movable platform or frame D supporting this tank is furnished with guide-bars D′, which work in recesses D^2, formed in the brackets D^3 D^3, that project from the framing of the machine. On the platform or frame D are fixed uprights D^4 D^4, whose upper ends are connected by a cross-piece D^5, which is coupled to the rocking beam E. Pivoted at *d*′ to the said platform D is a bent arm *d*, whose upper end $d^\times$ lies in the path of an adjustable stop or projection *f* on a float F, located within the liquid-tank C. Near the

lower end of this bent arm is a notch d^2, which is so situated that a tooth d^3 on a pivoted lever-handle d^4 will engage therewith when the latter is raised to a sufficient height. This lever-handle d^4 has a weighted end d^5 and its fulcrum d^6 is carried by the platform D.

G is an inlet-pipe for feeding the tank C with liquid, and is provided with a cock g, on the plug of which is mounted a grooved pulley g'. A chain g^2 passes around this pulley and is connected at one end to the lever-handle d^4, while its other end is free and carries a weight g^3.

The before-mentioned adjustable stop f consists of a set-screw which is adapted to more or less enter a socket f', carried by the float F, so that the distance of the head of this screw f from the float can be varied.

When the lever-handle d^4 is raised by the operator into the position shown in Fig. 2, it is retained in this position by the engagement of the tooth d^3 with the notch d^2, and simultaneously with the raising of the lever-handle the cock g is opened by reason of the weighted end of the chain g^2 descending and turning the pulley g' and its plug. Liquid then enters the tank C, the above-mentioned parts remaining in their locked position until the float F ascends high enough to press its adjustable stop f against the end $d^\times$ of the bent arm d, as shown at Fig. 1. The pressure of the stop f against the end of the bent arm causes this latter to turn about its pivot and release the tooth d^3 on the lever-handle d^4 from the notch d^2, with the result that the said lever-handle at once falls and, through the intervention of the chain g^2 and pulley g', operates the cock g in the reverse direction, thereby shutting off the further supply of liquid to the tank C.

During the filling of the tank the empty bottles are placed in proper position in the machine, and the hand-lever E' is then actuated to rock the beam E into the position shown in Fig. 2. This movement causes the tube-plate B to descend and bring the nozzles b^7 of the filling or siphon tubes into the bottles, and at the same time causes the tank C to ascend high enough to bring its contents above the level of the filling or siphon tubes. The filling of all the bottles then commences to take place simultaneously owing to the flow of the liquid from a higher to a lower level, the completion of the filling operation being effected by the siphonic action of the siphon-tubes b. The liquid in the tank C is thus transferred into the bottles in such a manner that the level of the liquid will be the same in all the bottles irrespective of any slight inequality in their capacity, the filling operation ceasing when the level of the liquid in the tank and the bottles is the same. The beam E is then rocked by the hand-lever E' in the opposite direction, thereby bringing the parts again into the position shown at Fig. 1. The lever-handle d^4 is then once more elevated to bring about a refilling of the liquid-tank C ready for charging a fresh series of empty bottles.

It will be seen that by adjusting the length of the stop f on the float F the release of the lever-handle d^4 and the consequent shutting off of the liquid supply to the tank can be effected in accordance with any desired level of liquid within the said tank C, so that the quantity of liquid with which the tank is supplied can be varied to suit the capacity of the bottles to be filled.

What we claim is—

1. Apparatus for bottling liquids substantially as described, consisting in the combination of a movable tube-plate carrying the filling or siphon tubes, a movable platform carrying the liquid-tank, a rocking beam from the opposite ends of which the aforesaid tube-plate and platform are suspended, pipes connecting the filling or siphon tubes to the liquid-tank, and means for automatically turning off the supply of liquid to the tank when a quantity sufficient to charge the entire series of bottles has entered the said tank.

2. In apparatus for bottling liquids a movable tube-plate carrying the filling or siphon tubes, in combination with a liquid-tank, these parts being so arranged relatively to each other that when the tube-plate is fully depressed to bring the nozzles of the filling or siphon tubes into the bottles to be filled the said filling or siphon tubes are lower than the level of liquid in the tank so that the filling operation is commenced by the action of gravity and is continued by the siphonic action of the siphon-tubes, until the level of the liquid in the tank and the bottles is equalized, substantially as described.

3. In apparatus for bottling liquids, the combination with the liquid-tank, of means for regulating the quantity of liquid supplied to the liquid-tank, these means consisting of a pivoted bent arm, a pivoted hand-lever adapted to engage with and be supported by the said bent arm when the hand-lever is raised, a weighted chain connected to the said hand-lever and passing over a pulley mounted on the plug of the liquid-supply cock, and an adjustable stop carried by a float situated within the tank, substantially as described.

In testimony whereof we have hereunto set our hands this 29th day of November, 1895.

WILLIAM ALEXANDER BOWIE.
ERNEST JAMES DODD.

Witnesses:
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WM. MELLERTON JACKSON.