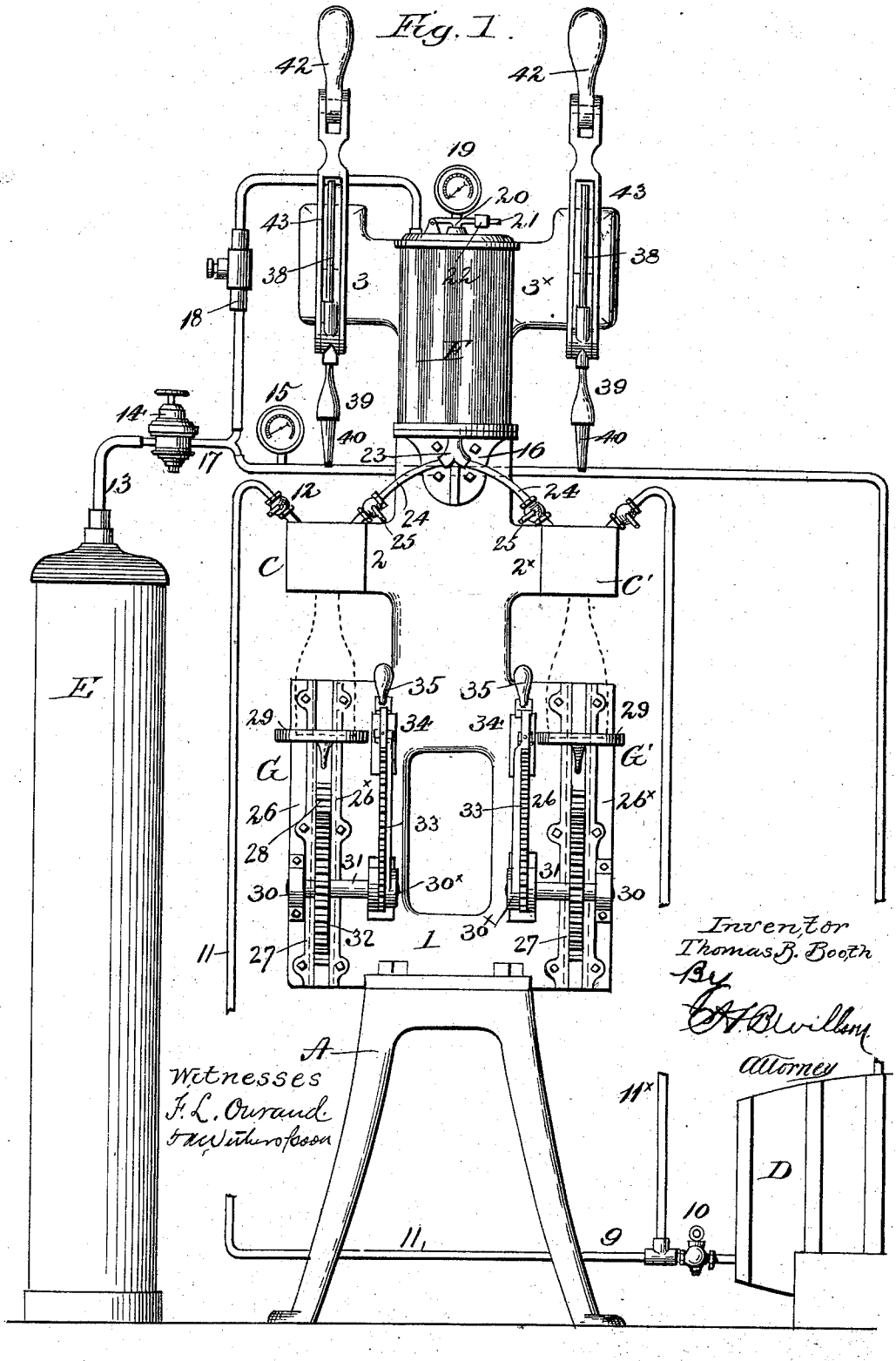
(No Model.) 3 Sheets—Sheet 1.

T. B. BOOTH.

BOTTLE FILLING MACHINE.

No. 565,598. Patented Aug. 11, 1896.

Fig. 1.



(No Model.)

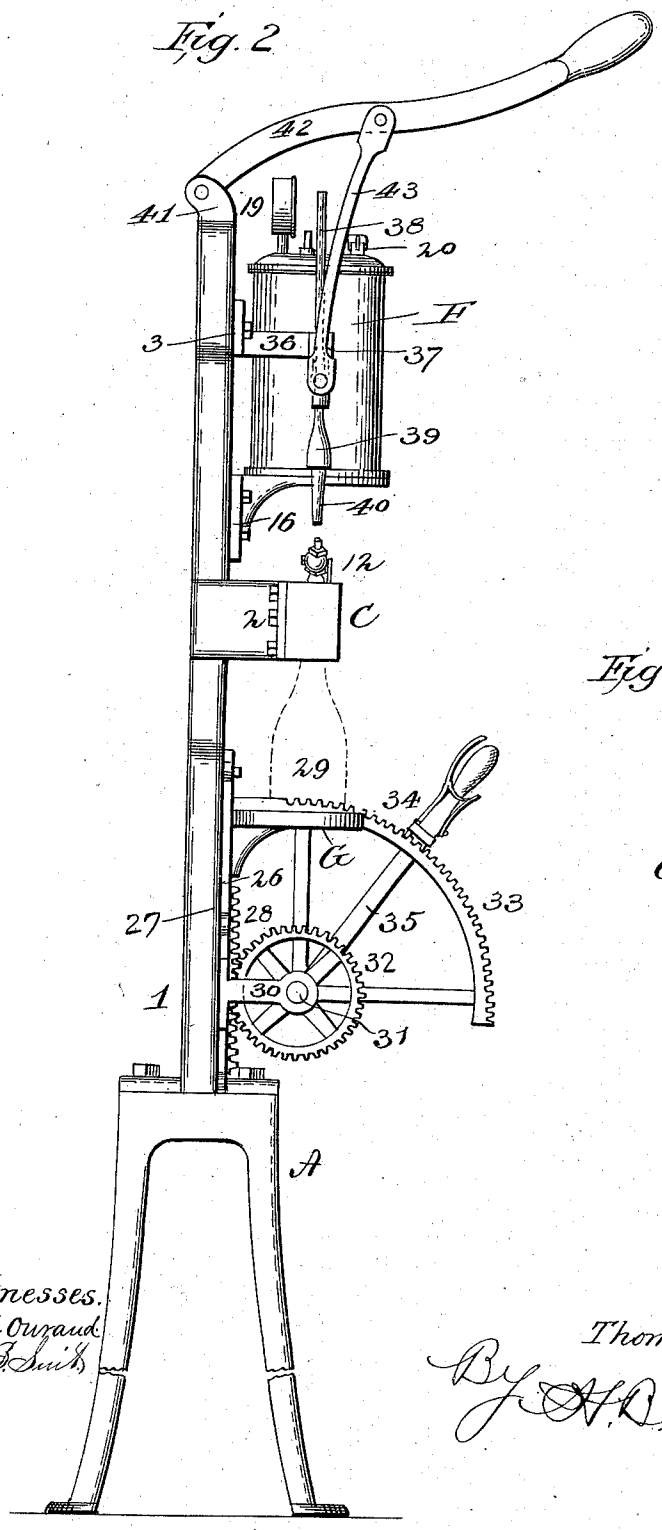
3 Sheets—Sheet 2.

T. B. BOOTH.

BOTTLE FILLING MACHINE.

No. 565,598. Patented Aug. 11, 1896.

Fig. 2



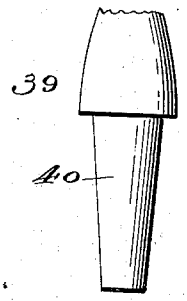
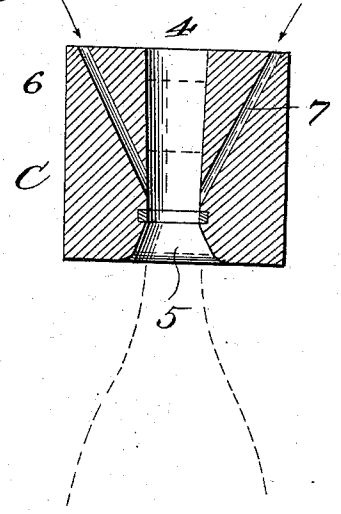


Fig. 3.



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(No Model.) 3 Sheets—Sheet 3.

T. B. BOOTH.

BOTTLE FILLING MACHINE.

No. 565,598. Patented Aug. 11, 1896.

Fig. 4.

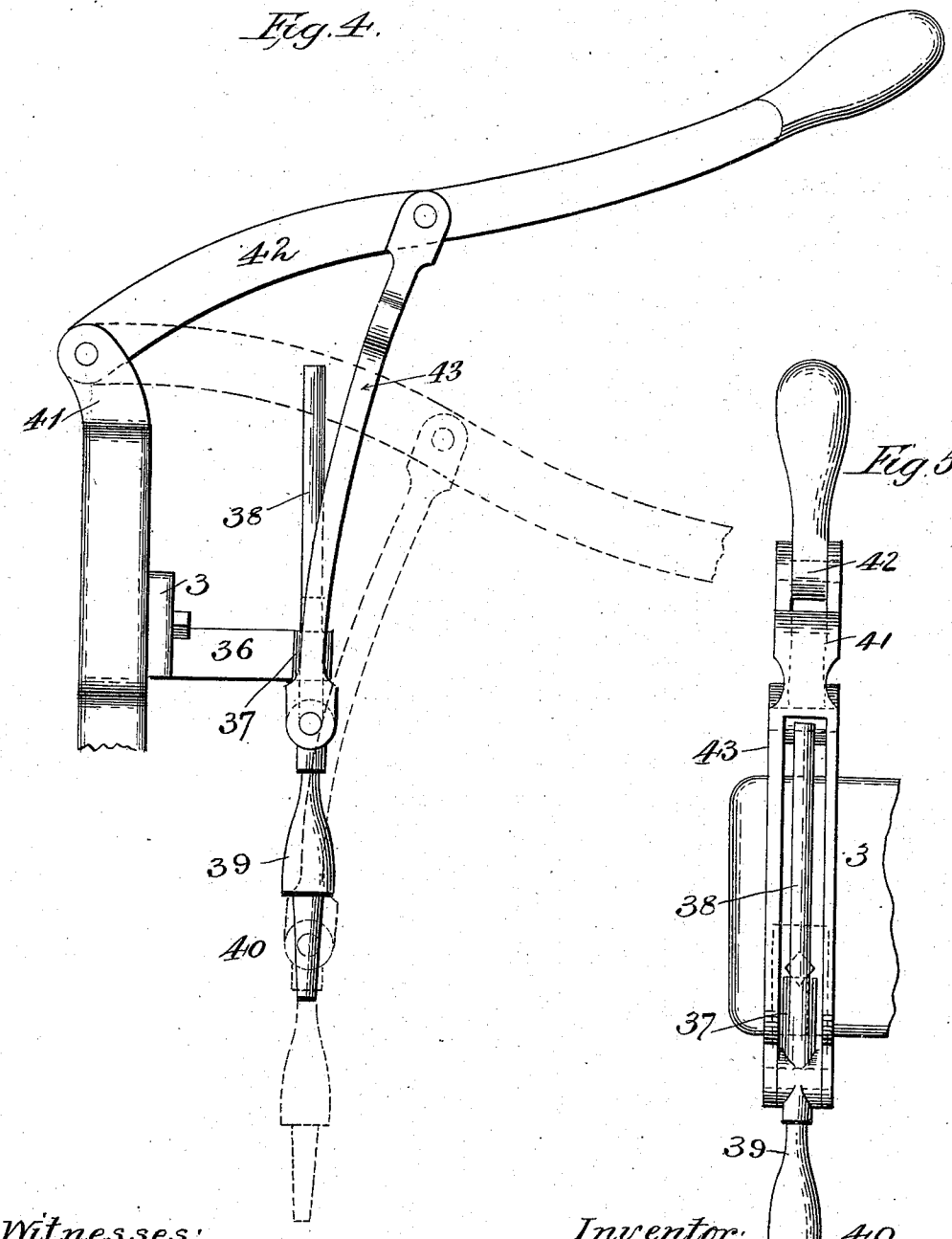
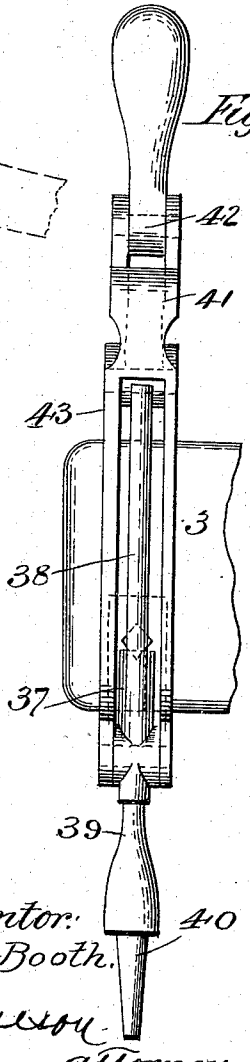


Fig. 5.



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UNITED STATES PATENT OFFICE.

THOMAS B. BOOTH, OF BOSTON, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO ALEXANDER ROBINSON, OF SAME PLACE.

BOTTLE-FILLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 565,598, dated August 11, 1896.

Application filed January 21, 1896. Serial No. 576,339. (No model.)

To all whom it may concern:

Be it known that I, THOMAS B. BOOTH, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Bottle-Filling Mechanism and Apparatus; 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.

My invention has relation to bottle-filling mechanism and apparatus; and the purpose or object is to provide an apparatus for effecting the object which will fill the bottle or bottles under pressure and cork them while the pressure is in force, thus preserving all the gases the liquid contains and keeping the liquids from atmospheric exposure and contact during the whole operation.

I accomplish the objects of my invention by the means and appliances illustrated in the accompanying drawings, wherein—

Figure 1 is a front elevation of the complete apparatus and associated mechanism. Fig. 2 is a side view in elevation. Fig. 3 is a central vertical section through one of the bottling-heads, showing the corking-channel, the liquid and gas ports or conduits, and the corking-plunger. Fig. 4 is a detail illustration of the lever mechanism and corking-plunger. Fig. 5 is a front view, in elevation, of the same.

It will be premised that my invention is illustrated as applied to a duplicate bottling mechanism; but it is apparent that it is equally applicable to mechanism for filling a single bottle at a time.

Referring to the drawings, A designates a suitable stand or support of any desirable shape and of such height and dimensions as to adapt it for the purposes intended. Secured to top of the support A is a strong metal casting or frame having a rectangular lower portion 1, which is supported and to which is secured the bottle holding and adjusting mechanism, and having intermediate of its length lateral extensions 2 $2^{\times}$, which support the filling-heads, and also having at the top lateral extensions 3 $3^{\times}$, which support the corking mechanism, all of which are specifically described hereinafter.

The filling-heads C C′ are duplicates in construction, the two being used only to increase the capacity of the machine. They are made of any suitable material and are provided with a vertically-arranged corkway 4, slightly tapering from top to bottom and opening into a flaring seat or socket 5, adapted to take on the head of a bottle, substantially as shown in Fig. 3 of the drawings. In the filling-heads are formed conduits 6 7, the former of which conveys the liquid to the bottle, and the latter conveys the gas or air and also serves to permit the escape of the overflow which may occur when the cork is forced down in the bottle. The ports, ways, or conduits 6 7 are preferably inclined in direction, as shown, and open at their lower ends into the corkway adjacent to its lower end, so that the cork in its preliminary disposition in the way may set well down toward the lower end and adjacent to the point of entrance to the bottle.

D designates a tank, barrel, or cask containing the liquid to be drawn therefrom and bottled. A suitable pipe connection is made with this vessel, as 9, provided with a turning plug or cut-off 10, and this pipe is carried to the bottle-heads by means of branches 11 $11^{\times}$ and their ends closely fitted, secured, and seated in the liquid-conduits of the filling-heads, substantially as shown in the drawings, each pipe being provided with a stop-cock 12 to admit and shut off the flow of the liquid.

E designates the pressure-tank, for air or gas, of any suitable size and contour. From the upper end of this pressure-tank runs a pipe 13, having a suitable pressure-regulator 14, arranged therein, which constitutes the high-pressure regulator to central and regulate the pressure on the liquid in the cask, the effect being produced through the pipe opening into the bung of the cask, substantially as indicated in the drawings. In the pipe 13 is fixed a pressure-gage 15, which serves to indicate the status of pressure, as usual.

On a bracket 16, secured to the frame, is

seated and secured a glass cylinder F, constituting a tank or reservoir, into which the air or gas from the compression-tank finds its way through a branch pipe 17, led from the main pipe 9 and opening into the cylinder F, as shown in Fig. 1 of the drawings. In the pipe 17 is interposed the low-pressure regulator 18, to regulate the pressure of the gas or air flowing into the cylinder F. On the cylinder F is mounted a low-pressure gage 19, and suitably mounted on the cylinder is a safety-valve 20, of any suitable construction. I have shown it as consisting of a lever 21, with an adjustable weight 22 thereon, and a valve on the lever setting in a valve-seat opening into the cylinder.

In the bottom of the cylinder is secured a pipe 23, branching in opposite directions, as at 24 $24^{\times}$, the ends of the branches opening into the filling-heads, and being provided adjacent to their points of entrance into the filling-heads with turning-plugs 25, by which the flow of air or other substance may be cut off. The glass cylinder F not only serves as a sight-glass to observe the extent of the contents, but it also serves as a receptacle to receive the overflow of liquid and gas from which may be thrown or forced back when the corks are forced down into the bottle-neck. It will be perceived from the foregoing description that the liquid-pressure and the air-pressure in the cylinder are not in equilibrium, the former being heavier than the latter, the purpose being to insure the escape of the excess of liquid and air from the neck of the bottle when the cork is forced home into the glass cylinder, and to be returned to a bottle when placed under the filling-heads and the branch pipes are opened before the liquid-pipes are opened for the purpose of filling the bottles.

G G′ designate the brackets, on which the bottles are placed preparatory to being lifted upward and their heads forced into the seats in the filling-heads. These brackets are duplicates in construction and means for operating them, and consist of the following-described mechanism: On the frame are arranged and secured two vertical parallel bars 26 $26^{\times}$, having a flanged way 27 between them, in which is slidingly disposed a rack-bar 28, having formed or secured to its upper end a seat 29, adapted to hold a bottle, as indicated. Journaled in suitable bearings 30 $30^{\times}$, fixed to the face of the frame, is a shaft 31, carrying a gear-wheel 32, meshing with the rack-bar, and on the bearing $30^{\times}$ is secured a sector-rack 33, which is engaged by a pawl 34 on a lever 35, having its lower end mounted on the shaft 31, as shown in the drawings.

It will be observed from the foregoing, taken in connection with the drawings, that the rack-bar with the bottle-seat may be raised and lowered by moving the lever to turn the gear-wheel, and thus when a bottle is placed on the bottle-seat by moving the rack upward the head of the bottle will become seated in the filling-head directly under the corkway therein in position to receive the charge and to have the cork inserted.

The corking mechanisms are also duplicates in construction, and consist of the following-described parts or elements: To each of the lateral extensions 3 $3^{\times}$ is fixed an arm 36, arranged at right angles to the face of the extensions and formed with a sleeve 37 at the outer end, in which is slidingly arranged the stem 28 of the cork-plunger 39, formed at its lower portion with a tapering plug 40, which fits in the corkway in the filling-head. To the top of the frame or extensions is a lug 41, in which is fulcrumed a hand-lever 42, carrying a link or bar 43, having its upper end pivotally hung to the lever and its lower end similarly connected to the stem of the plunger, substantially as shown in the drawings. By moving the lever 42 down on a cork in the corkway in the filling-head the cork is pushed in the head of the bottle.

The operation of the machine is as follows: The air or gas is turned on from the pressure-tank by turning the two pressure-regulators to the required pressure, which varies according to the kind of fluids to be bottled, ranging from ten to one hundred pounds on the high-pressure regulator and from five to seventy-five pounds on the low-pressure regulator. The bottles are then placed on the bottle-seats and forced up with their heads tight into the seats in the filling-heads by means of the mechanism provided for that purpose. The corks are then placed tight in the corkways of the filling-heads, the cocks in the branch pipes leading from the sight-glass cylinder, and then opened to permit the air or gas to flow into the bottles, which operation is continued until the bottles are under the same pressure as that originally shown in the sight-cylinder, when the cocks in the liquid-pipes are turned on and the liquid permitted to flow into the bottles until they are full, when the liquid-cocks are closed and the corks driven down by the corking mechanism, any overflow passing up through the branch pipes to the glass cylinder and returning to the next set of bottles. By this mode of procedure the liquid, be it wine, water, ale, or beer, is sure to be uniform and retain all its original gas, and is bettered by not coming in contact with the external atmosphere.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

In a bottle-filling machine, the combination with the filling-head, of a corking and bottle-holding mechanism, comprising a vertical standard, having an arm 36 projecting therefrom formed with a sleeve 37, a cork-plunger 39, having its stem 38 slidingly arranged in the said sleeve and formed with a tapering corking-plug 40, a hand-lever 42 fulcrumed to the vertical post 1, and a link 43 having its

respective ends pivotally connected to the said lever and to the stem of the cork-plunger below the said sleeve, and the coacting bottle-holder comprising a suitably-supported vertical guide, a rack-bar 28 arranged in said guide and formed with a bottle-seat on its upper end, the shaft 31, a gear-wheel on the shaft to mesh with the rack-bar, a suitably-supported sector-rack, a lever to turn the said shaft and a pawl to engage the sector-rack, substantially as and for the purpose specified.

In testimony whereof I hereunto affix my signature in presence of two witnesses.

THOMAS B. BOOTH.

Witnesses:
WM. S. PEPPERELL,
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