

No. 665,892.

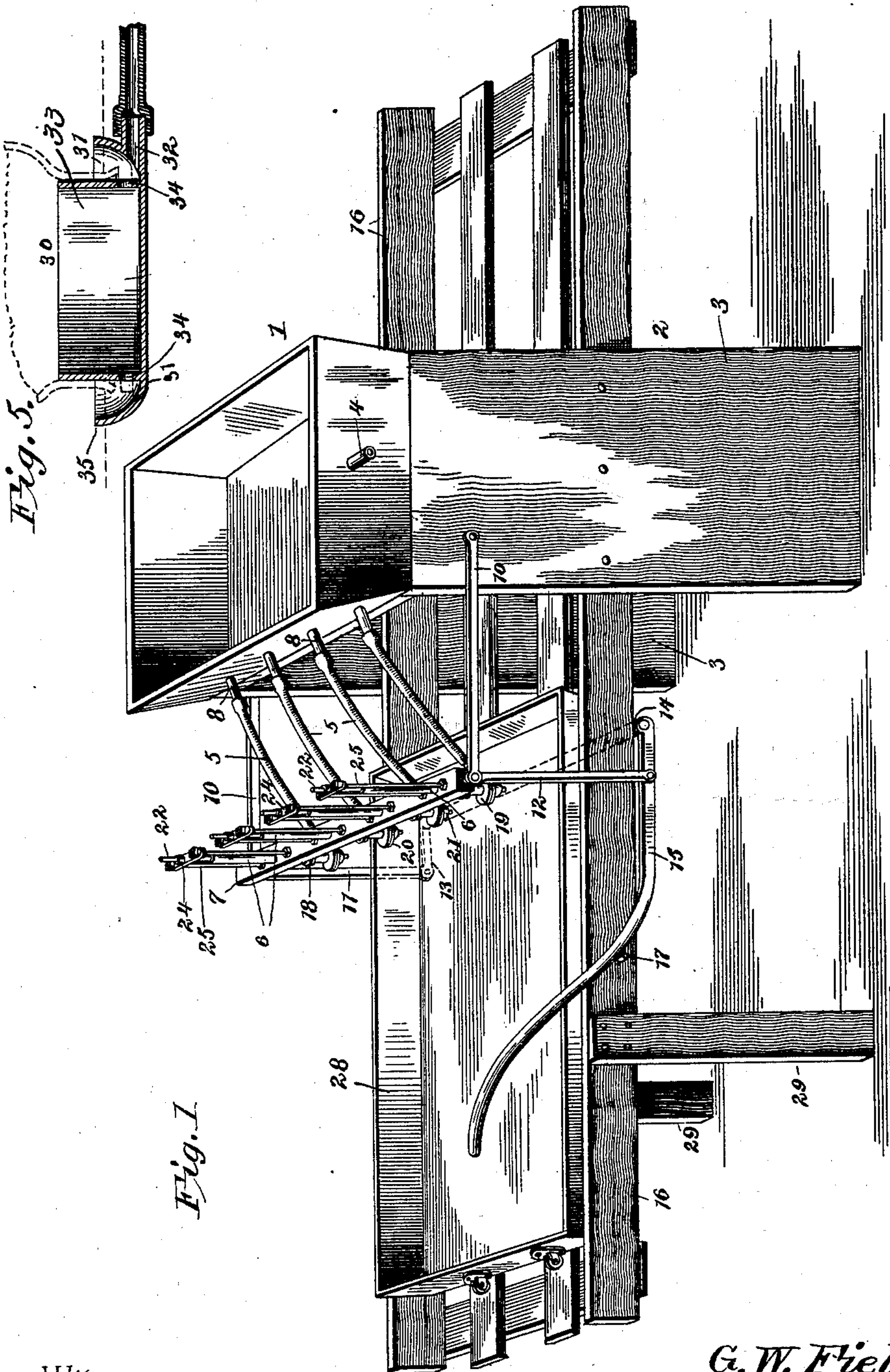
Patented Jan. 15, 1901.

G. W. FIELD.
BOTTLE FILLING MACHINE.

(Application filed May 31, 1899.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses

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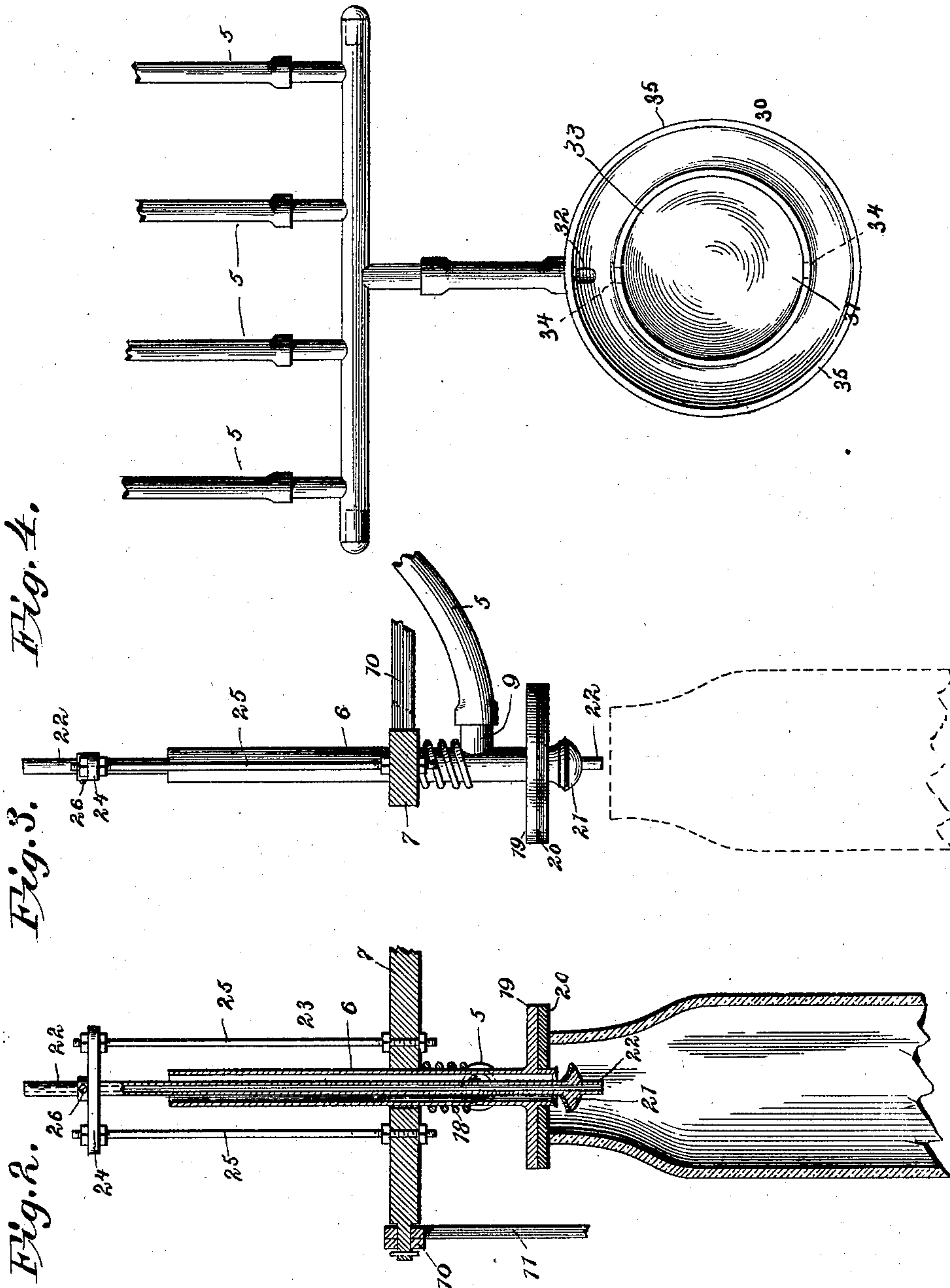
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UNITED STATES PATENT OFFICE.

GEORGE W. FIELD, OF NORTH BRANCH, NEW JERSEY.

BOTTLE-FILLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 665,892, dated January 15, 1901.

Application filed May 31, 1899. Serial No. 718,879. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. FIELD, a citizen of the United States, residing at North Branch, in the county of Somerset and State of New Jersey, have invented a new and useful Bottle-Filling Machine, of which the following is a specification.

The invention relates to improvements in bottle-filling machines.

The object of the present invention is to improve the construction of machines for filling bottles and to provide a simple and comparatively inexpensive one designed for filling bottles with milk and other liquids and capable of uniformly filling a row of bottles and of enabling the rows to be rapidly brought into position for filling.

The invention consists in the construction and novel combination and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended.

In the drawings, Figure 1 is a perspective view of a bottle-filling machine constructed in accordance with this invention. Fig. 2 is a vertical sectional view illustrating the arrangement of one of the filling-tubes and the valve mechanism. Fig. 3 is an elevation of the same. Fig. 4 is a reverse plan view illustrating another form of tank. Fig. 5 is a vertical sectional view of the same.

Like numerals of reference designate corresponding parts in all the figures of the drawings.

1 designates a tank designed to contain the liquid to be bottled and mounted on a frame 2, which may consist of sides or standards 3 and a connecting top piece; but any other suitable supporting-frame may be provided. The tank is provided with an inlet-pipe 4, which may communicate with any suitable source of supply, and if connected with an air-tight receptacle, such as an elevated cask or barrel, the liquid will rise in the tank to the height of the inlet-tube 4 and will be maintained at that elevation until the contents of the cask or receptacle are consumed. A series of distributing-pipes 5 extend from the tank, and they are connected with vertical filling-tubes 6, which are mounted on a detachable frame or support 7. These distributing-tubes preferably consist of flexible

sections or portions connected at their upper ends to short pipes 8 and having their lower ends coupled to horizontal branches 9 of the vertical filling-tubes, the flexible portions or sections of the distributing-tubes permitting the upward and downward movement of the depressible frame or support 7. The depressible frame or support 7 consists of a horizontal bar or beam connected at its ends by links 10 with the sides or standards of the supporting-frame and having depending links or rods 11 and 12, which connect the depressible frame with the operating mechanism for raising and lowering it. The link 11, which is disposed substantially in a vertical frame, has its lower end pivoted to an arm 13 of a transverse rock-shaft 14. The arm 13 is located at one end of the rock-shaft, and an operating-lever 15, which is fixed to the other end of the rock-shaft, is connected to the lower end of the link 12. The transverse rock-shaft is journaled in suitable bearings of a track or way 16, and the operating-lever, which is preferably curved, as shown, may be normally supported by a projection or pin 17 for holding the depressible frame normally elevated for a purpose hereinafter described; but it may be spring-supported, if desired. When it is supported by the projection or pin 17, it will have sufficient lateral movement or play to enable it to be readily engaged with and disengaged from its support to raise and lower the depressible frame.

Each filling-tube 6, which is mounted in an opening of the depressible frame or support, extends above and below the same and is connected therewith yieldingly, preferably by means of a coiled spring 18, located beneath the frame or support 7 and disposed on the filling-tube. The filling-tube is provided near its lower end with a disk or flange 19, adapted to cover the mouth of a bottle and provided at its lower face with a flexible or elastic washer or gasket 20 to enable it to make a liquid-tight joint or connection between it and the bottle to prevent any leakage of the material during the filling operation. The lower extremity of the filling-tube projects beyond the lower face of the washer or gasket and when the depressible frame is elevated is closed by a valve 21, mounted on a vertical air-tube 22, extending through the

filling-tube and forming a vent. The air-tube, which extends above the filling-tube and which forms a valve-stem, is connected with the depressible frame by a yoke 23, comprising a cross-head 24 and rods 25. The cross-head is provided with a central opening to receive the air-tube, and it is adjustably connected with the same by means of a set-screw 26, mounted on a collar or extension of the cross-head. The rods 25, which have their ends threaded, are secured to the terminals of the cross-head and to the depressible frame by nuts arranged in pairs and engaging the upper and lower faces of the cross-head and the frame 7, as clearly illustrated in Figs. 2 and 3 of the accompanying drawings. The lower end of the filling-tube is slightly flared, and the upper face of the valve 21 is tapered and provided with an elastic covering, and when the depressible frame is elevated and the filling-tube is out of engagement with a bottle the coiled spring, which is interposed between the depressible frame and a suitable stop of the filling-tube, holds the valve tightly against the lower end of the latter and effectually prevents the escape of the material. As the liquid rises in the filling-tube the latter is designed to be of sufficient length to extend above the surface of the liquid within the tank or reservoir. When the depressible frame is lowered by the operating mechanism heretofore described, the plates or caps 19 close the mouths of the bottles and engage the same, whereby the downward movement of the filling-tubes is limited. This causes the valves, which are rigidly connected with the depressible frame, to open and a flow of the liquid is produced, the air from the bottle escaping from the air-tubes, which form vents, and by allowing the valves to remain open the bottles will be uniformly filled without permitting the loss of any of the liquid. The valves close before the filling-tubes leave the necks of the bottles, and the projecting portion of the mechanism by being located within the bottle during the filling operation, as clearly shown in Fig. 2, will prevent the bottle from being filled to too great an extent and there will be no loss of material.

The bottles to be filled are designed to be arranged in rows in a car or carrier 28, mounted on suitable wheels and supported by the track or way 16, which may, as illustrated in the accompanying drawings, consist of a horizontal platform or support supported by legs 29 and by the sides or standards of the supporting-frame and provided with suitable sides. The rows of bottles are successively brought beneath the filling-tube and are filled, as before explained. Any number of filling-tubes may be provided and a large number of bottles may be handled in a comparatively short space of time.

Instead of employing a tank of the form shown in Fig. 1 an inverted milk-can 30 may be arranged as shown in Figs. 4 and 5. The

cover 31 of the can is provided with a discharge-tube 32, and its cylindrical portion 33, which extends into the neck of the can, is provided with apertures 34, located beyond the neck of the can, as clearly shown in Fig. 5, and adapted to permit the contents of the latter to flow into the outer flange portion 35, which forms a receptacle. The milk will rise in the trough or receptacle formed by the flange 35 until the apertures are submerged, and as fast as it is drawn off through the distributing-tube it will flow from the can into the surrounding trough or receptacle. The cover 31 is adapted to be applied to a number of cans, and the apertures may be plugged with corks or the like while the can is being inverted.

The invention has the following advantages: The filling-machine, which is simple and comparatively inexpensive in construction, is easily operated, and it will enable a large number of bottles to be filled in a comparatively short time. The filling-tubes, which are yieldingly connected with the depressible frame, are normally closed by valves, which are held closed by the springs for yieldingly connecting the said filling-tubes to the frame. The valves are mounted on the air-tubes and a vent is provided as soon as a valve is open. The valves may be held open until the entire row of bottles is filled, and the valve mechanism, which extends into the necks of the bottles, will prevent the latter from being filled to too great an extent. The valves close before the caps or covers of the filling-tubes leave the necks of the bottles and there is no leakage or loss of the material.

Changes in the form, proportion, size, and the minor details of construction within the scope of the appended claims may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

What is claimed is—

1. In a device of the class described, the combination of a depressible support having an opening, a filling-tube passing through the opening and provided a short distance from its lower end with a flange 19, a flexible or elastic gasket arranged on the lower face of the flange 19, a valve-stem extending through the filling-tube and provided at its lower end with a valve arranged to close the said tube, and means for connecting the upper end of the valve-stem with the depressible support and for yieldingly engaging the valve and the filling-tube, substantially as described.

2. In a device of the class described, the combination of a supporting-frame, a depressible frame or support provided at intervals with openings, filling-tubes arranged in the openings of the depressible frame or support and provided below the same with branches, distributing-pipes connected with the branches, coiled springs disposed on the filling-tubes and engaging the said branches and the depressible frame or support, a series of

yokes mounted on the depressible frame or support at the openings thereof and extending over the filling-tubes, the valve-stems extending through the filling-tubes and provided at the lower ends thereof with valves and having their upper ends adjustably secured to the said yokes, and means for operating the depressible frame or support, substantially as described.

3. In a device of the class described, the combination of a supporting-frame provided with a horizontal track or way extending in advance and in the rear of it, a tank or reservoir mounted on the supporting-frame and located above the track or way, a depressible support or frame provided at intervals with openings, links 10 connecting the depressible frame with the supporting-frame, filling-tubes arranged in the openings of the depressible frame or support, flexible distributing-pipes extending from the filling-tubes to the tank or reservoir coiled springs disposed on the filling-tubes and connected with the same and with the depressible support, yokes mounted on the latter and extending over the filling-tubes, vent-tubes extending through the filling-tubes and projecting beyond the same, the lower ends of the vent-tubes being provided with valves and their upper ends being adjustably connected to the yokes at a point above the filling-tubes, a rock-shaft mounted on the supporting-frame and provided with arms connected with the depressible frame or support, one of the arms being extended to form a handle or lever, and a tray mounted on the track or way and adapted to carry bottles beneath the depressible frame or support, substantially as described.

4. In a device of the class described the combination of a depressible support, a filling-tube yieldingly connected with the said support, a yoke mounted on the support and

extending over the filling-tube, a valve-stem extending entirely through the filling-tube and adjustably connected at its upper end to the yoke, and provided at its lower end with a valve, and means for operating the depressible support, substantially as described.

5. In a device of the class described, the combination with a depressible support having an opening, a filling-tube passing through the opening, and yieldingly connected with the support, a yoke extending over the filling-tube and composed of a top piece or portion and sides adjustably secured to the support by nuts arranged in pairs, a valve-stem extending through the filling-tube and secured at its upper end to the top of the yoke adjustably, and a valve arranged at the lower end of the valve-stem, substantially as described.

6. In a device of the class described, the combination of a depressible support having an opening, a filling-tube passing through the opening and yieldingly connected with the support and provided a short distance from its lower end with a flange 19, a flexible or elastic gasket arranged on the lower face of the flange and located above the lower end of the filling-tube, a yoke extending over the filling-tube, and a valve-stem extending through the filling-tube, adjustably connected with the yoke at a point above the said tube and provided at its lower end with a valve arranged to engage the lower end of the filling-tube, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

GEORGE W. FIELD.

Witnesses:

IDA A. HAHN,
JAMES L. GRIGGS.