

E. H. PARKER.
BOTTLE FILLING MACHINE.
APPLICATION FILED NOV. 27, 1907.

995,711.

Patented June 20, 1911.

4 SHEETS-SHEET 1.

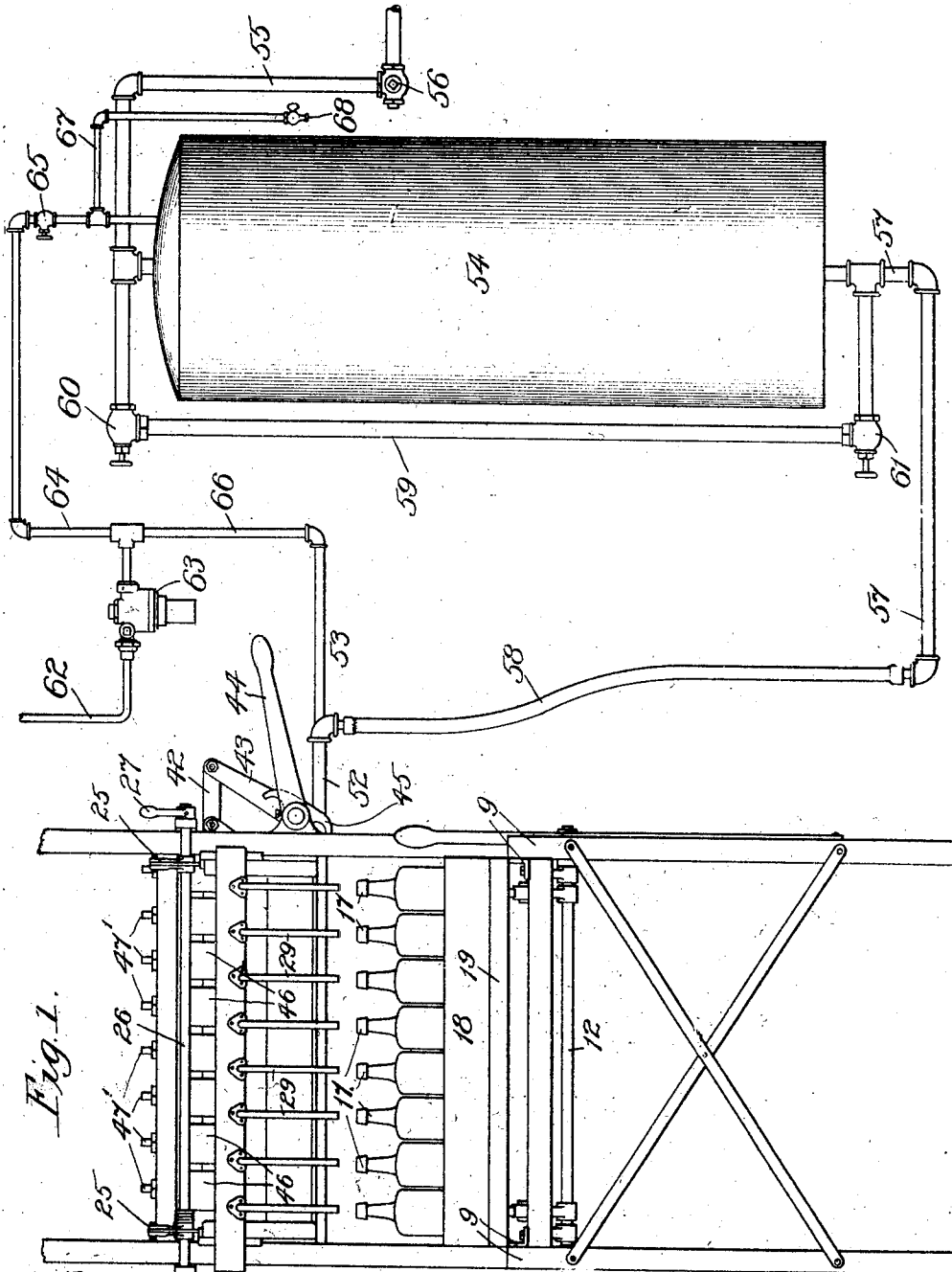


Fig. 1.

Witnesses:

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Chas. H. Guelly

Inventor:

Emor H. Parker,
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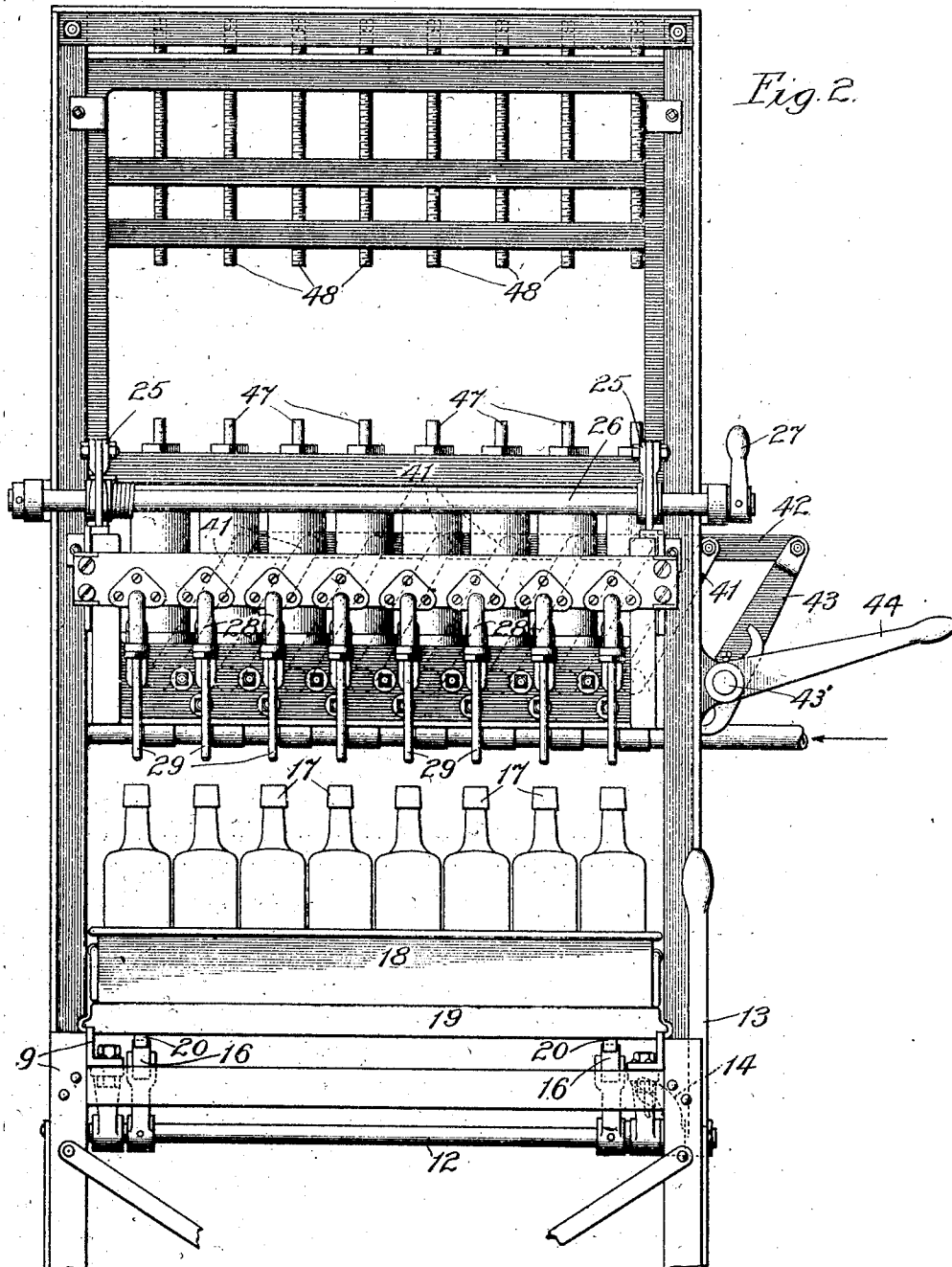


Fig. 2.

Witnesses:

Edw. J. Gaylord,
Chas. H. Bull.

Inventor:

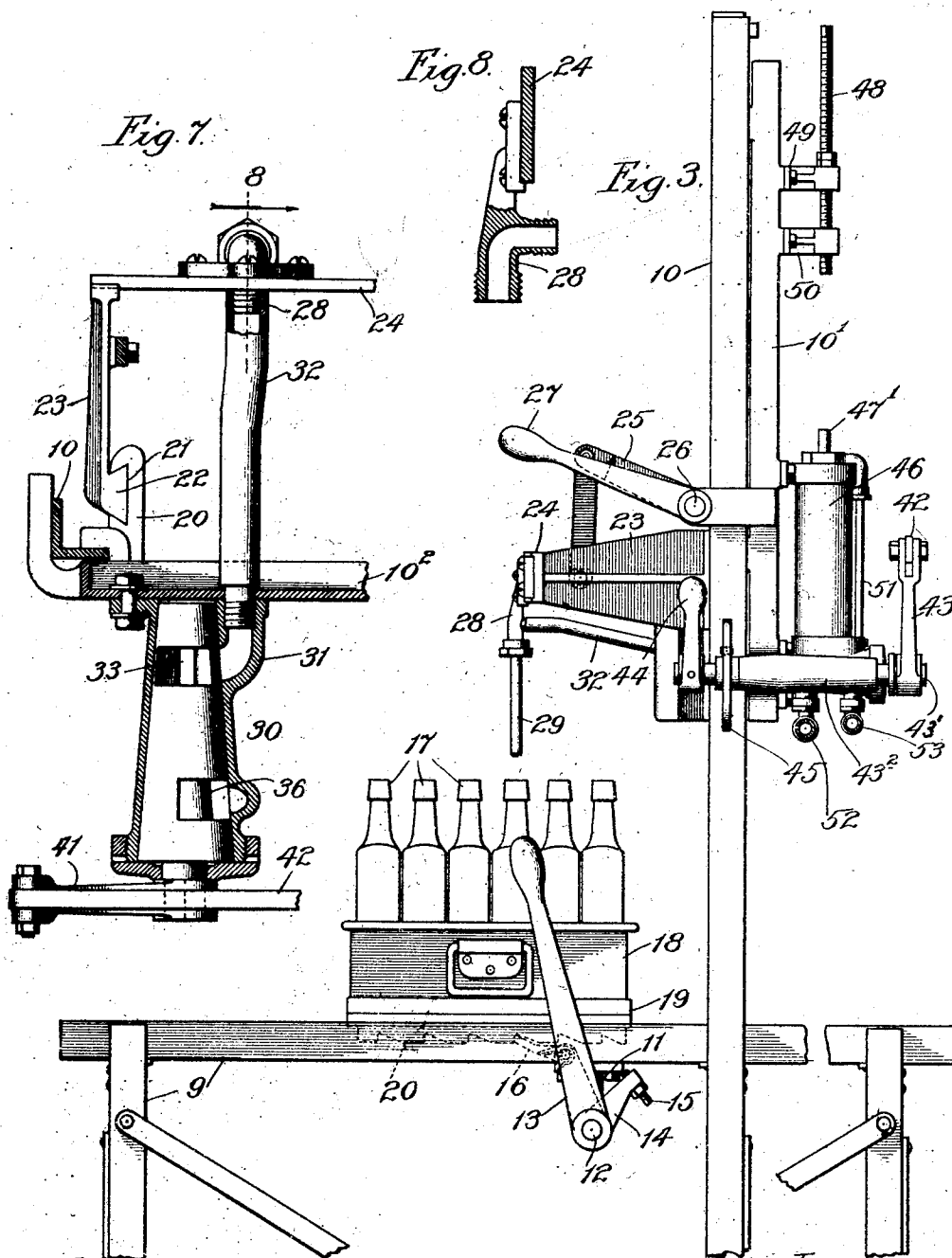
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4 SHEETS—SHEET 3.



Witnesses:
Edw. J. Lloyd
Chas. H. Bull

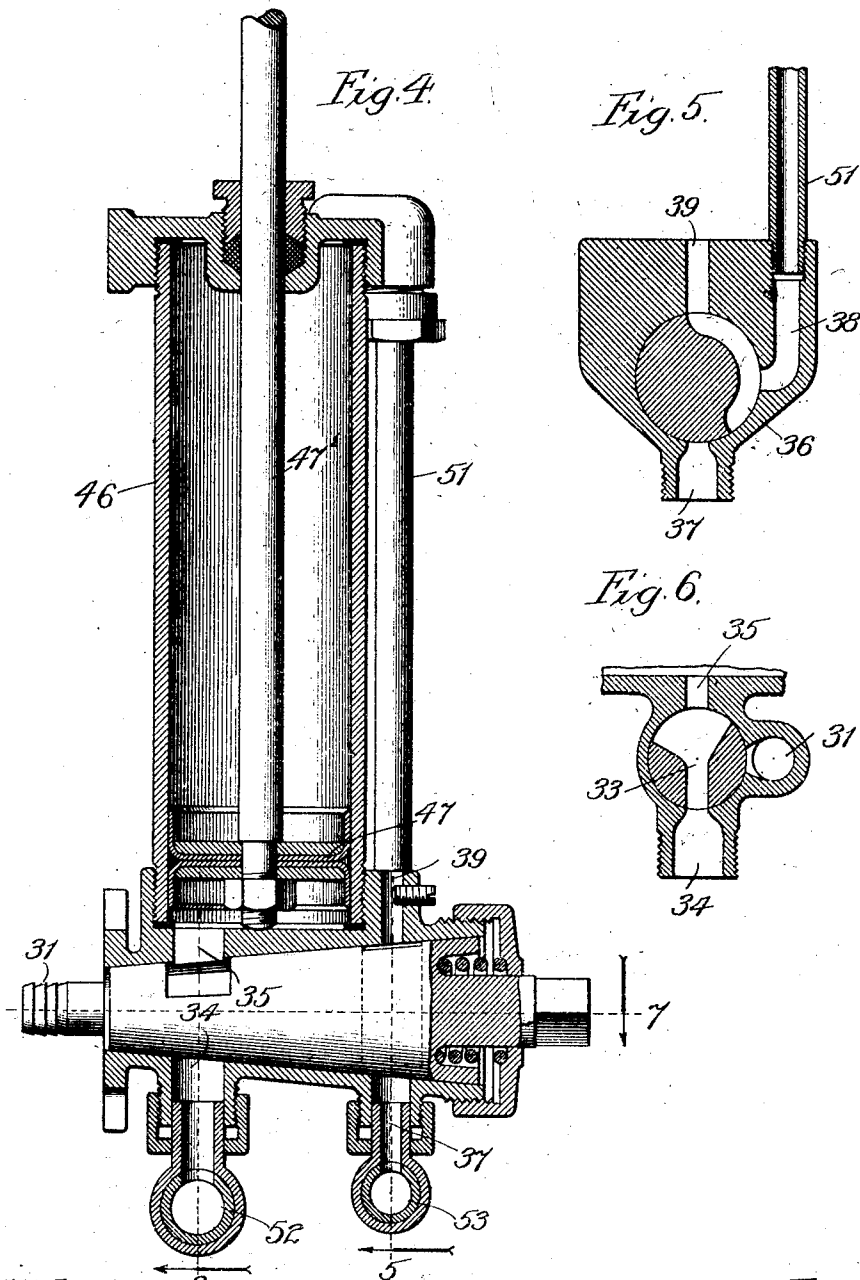
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4 SHEETS-SHEET 4.



Witnesses:
Edw. J. Dayford
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Inventor:
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UNITED STATES PATENT OFFICE.

EMER H. PARKER, OF EVANSTON, ILLINOIS, ASSIGNOR TO THE LIQUID CARBONIC COMPANY, OF CHICAGO, ILLINOIS. A CORPORATION OF ILLINOIS.

BOTTLE-FILLING MACHINE.

995,711.

Specification of Letters Patent. Patented June 20, 1911.

Application filed November 27, 1907. Serial No. 404,028.

To all whom it may concern:

Be it known that I, EMER H. PARKER, a citizen of the United States, residing at Evanston, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Bottle-Filling Machines, of which the following is a specification.

My invention relates to an improvement in machines for automatically filling bottles or other varieties of package with material in liquid or semi-liquid form; my primary object being to provide a novel construction of pneumatically-operated machine of the character referred to that will adapt it to measure into the package a definite quantity of the material.

In the accompanying drawings, Figure 1 is a broken view showing the filling-machine in front elevation and also showing the supply-reservoir for the material and its connections with the machine; Fig. 2 is a similar view showing the machine more completely and on a larger scale than that observed in Fig. 1; Fig. 3, a broken view of the machine in side elevation; Fig. 4, a broken enlarged view in sectional elevation of a measuring and filling cylinder of the machine with its admission and discharge controlling valve; Figs. 5, 6 and 7 are enlarged sections taken, respectively, at the lines 5, 6 and 7 on Fig. 4 and viewed as indicated by arrows, and Fig. 8 is an enlarged section taken at the line 8 on Fig. 7 and viewed in the direction of the arrow.

I have more immediately devised my improved machine for filling bottles with liquid (especially medical preparations) and therefore hereinafter described it as applied to that purpose.

The base of the machine is a rectangular horizontal frame 9, formed preferably of light bar-metal and suitably braced, with a similarly formed rigid upright rectangular frame 10 on the rear portion of the main or base frame.

While the machine is used for filling simultaneously a plurality of bottles of uniform or varying sizes and capacities in a row, it is also, of course, capable of use for filling a single bottle.

In similar bearings 11 depending, near the front of the upright frame 10, from the side-rails of the frame 9, is journaled a rock-shaft 12 carrying a handle 13 on one end which also carries an arm 14 provided on its outer

end with an adjustable stop 15 to engage with the base of the adjacent side-rail for limiting the throw of the rock-shaft. On this rock-shaft are also carried near the inner ends of its bearings spring-dogs 16, 16.

The bottles 17 to be filled are stably supported in rows in the compartments of a suitable rack 18 which fits and seats within a tray 19 provided along the end-portions of its base with rack-teeth 20, whereby when a bottle-filled tray is imposed on the top of the frame 9 it may be placed with the front row of bottles registering at their necks with the depending filling-tubes, hereinafter described, and with the racks engaging at their forwardmost teeth with the dogs 16. Thus, when one row of the bottles has been filled, by turning the rock-shaft backwardly the dogs engaging the racks will move the tray one step backward to bring the next row of bottles with their necks in alignment with the filling-tubes, and so on until all the rows of bottles have been filled, the rack-teeth being spaced apart with reference to positioning the bottle-necks in the successive rows relative to the filling tubes.

To the backs of the side-members of the upright frame 10 is fastened a rectangular cast frame 10¹, from near opposite ends of the lower horizontal member 10² of which project arms 21 having dovetailed guide-grooves 21¹ formed in their head-portions to receive the similarly shaped heads 22 on the rear ends of arms 23 connected together from their outer ends by a horizontal bar 24. The supplemental frame formed of these members 23, 24 is reciprocally supported in the guides 21 by hinged links 25 connected with the arms 23 and secured upon a spring-retracted rock-shaft 26 journaled in suitable bearings on the frame 10 and provided on one end with an operating-handle 27. Nozzles 28 of the shape represented in Fig. 8 depend rigidly from the bar 24 at intervals corresponding with those between the necks of the bottles 17 in each row thereof extending transversely of the frame 9, and from each nozzle depends a filling-tube 29.

Behind the frame 10¹ and extending horizontally backward from its lower bar 10² are provided the tapering casings of valves 30, one for each nozzle 28 with which it is connected from a lateral branch 31 by a section of flexible tubing 32. The rotary solid

plug of each valve is provided near its tapering end with a transverse passage 33 expanded toward one end, as shown in Fig. 6, to communicate with an inlet-port 34 in the under side of the valve-casing and with a cylinder-filling port 35 in the upper side of the same; and each plug is provided near its wider end with an arc-shaped passage 36 (Fig. 5) to communicate with an inlet-port 37 for compressed air in the bottom of the casing and with an air-pressure port 38 and an exhaust-port 39 in the top of the casing. The spring-pressed stems of the plugs in the horizontal row of valves 30 are provided with handles 41 all connected together at their free ends by a handle-bar 42, one end of which has pivotally connected with it an arm 43 extending from one end of a rock-shaft 43¹ journaled in a bearing 43² and carrying an operating handle 44 on its opposite end near which the shaft carries a forked stop 45 to bear at its ends alternately against the adjacent side of the frame 10 in turning the shaft 43¹ to limit the extent of turning it. Each valve-casing is surmounted by a measuring-cylinder 46 having an open base covering a filling-port 35, the cylinder containing a piston 47 on a stem 47¹ passing through a stuffing-box in its upper end and alining with a threaded vertical stop-rod 48 adjustably supported in bearings 49, 50 projecting backwardly from horizontal ribs of the rear frame 10¹. An air-pressure pipe 51 leads from the upper end of each cylinder 46 to the port 38 in the valve-casing below it. The ports 34 of all the valve-casings in the row thereof are connected by a pipe 52 forming a header and the ports 37 are similarly connected by an air-pressure conduit 53.

At 54 (Fig. 1) is represented a supply-tank for liquid to be filled into bottles 17. This tank communicates from its upper end through a supply-pipe 55 containing a shut-off valve 56, with a reservoir (not shown) for holding the supply of the liquid, and from its lower end through a pipe 57 and a hose-extension 58 thereof with the open end of the header 52. A glass gage 59 is connected at its opposite ends, containing shut-off valves 60 and 61, respectively, with the pipes 55 and 57. From an air-pressure supply (not shown) there leads a pipe 62 containing a pressure-reducing valve 63 of any suitable or ordinary construction, one branch 64 of this pipe containing a shut-off valve 65 and leading into the tank 54 at its upper end, and the other branch 66 leading to the open end of the air-pressure conduit 53. A vent-pipe 67 extends from the pipe 64 and terminates in a pet-cock 68.

The machine is operated as follows: The tank 54 being charged through the pipe 55 to any desired height with the liquid to be filled into bottles, the vent-cock 68 being

meantime open and the valve 65 closed, air under suitable pressure is admitted, on opening the valve 65 and closing the vent cock 68, through the pipe 64 upon the liquid in the tank to force it out at the bottom thereof into the header 52. With a tray of bottles in position on the frame 9, and all the valves 30 in their normal position of registering the ports 34, 35 of each with a valve-passage 33 and the ports 38, 39 with a valve-passage 36, the liquid forced into the header passes upward against the pistons 47 into the cylinders 46, whence the air in them vents through the pipes 51, ports 38, passages 36 and exhaust-ports 39. The stop-rods 48 are adjusted to be encountered by and arrest the rise of the piston-rods at a predetermined height according to the extent of filling the cylinders. The charge admitted into each cylinder is to be just sufficient to fill a bottle 17 and the stop-rods are set in their bearings to arrest the rise of the pistons when the cylinders are filled to that extent. If they are to be filled uniformly to discharge into and fill bottles of uniform capacity, all the stop-rods are adjusted alike; but if bottles of different capacities are to be filled the adjusted positions of the stop-rods vary accordingly. The operator then lowers the filling-tubes 29 through the necks of a transverse row of bottles, by turning the rock-shaft 26 at the handle 27, and thereupon turns the handle 44 to rock the shaft 43¹ and thereby shift the handle-bar 42 to turn the plugs of all the valves to register their passages 36 with the respective ports 37 and 38 and their passages 33 with the respective ports 34 and lateral outlet-passages 31 leading to the filling-tubes. Thus the air-pressure from the conduit 53 enters the cylinders 46 through the pipes 51 and exerts pressure upon the pistons to lower them and force the charge of liquid ahead of each through the respective valve-passages 33 and outlet-passage 31 into a bottle, into which the entire contents of a cylinder are thereby discharged. The operator then releases the handle 27 to permit the spring-pressed rock-shaft 26 to raise the filling-tubes out of the bottles, and the handle 13 is turned to cause the dogs 16 to shift the tray 19 in the direction for bringing the next transverse row of bottles into alinement with the filling-tubes, whereupon the latter are again lowered through the bottle-necks and the handle 44 is turned back to its initial position to permit the pressure maintained in the tank 54 to again charge the measuring-cylinders, which are then discharged as and for the purpose already described. These operations are repeated for each row of bottles in as many trays thereof as the supply in the tank will suffice for each tray, when the bottles it holds have been filled, being replaced by one containing empty bottles.

As will thus be seen, the operation consists, broadly stated, in forcing the supply of liquid by pneumatic pressure into a valve-controlled measuring receptacle and discharging the contents of the latter by pneumatic pressure into the shipping-package.

My invention is attended with numerous advantages, among which may be mentioned simplicity, ease and reliability of operation, stoppage of running when the measured quantity in a cylinder is discharged, whether or not any of the bottles be broken, and absence of packing and of telescoping tubes with their liability to get out of order and disorganize the machine.

What I claim as new and desire to secure by Letters Patent is—

1. In a filling machine of the character described, the combination of a horizontal frame adapted to support a crate of packages to be filled, an upright frame, filling valves supported on said upright frame, arms on the upright frame, a vertically movable supplemental frame guided on said arms, nozzles on said supplemental frame, filling tubes connected to said nozzles, flexible tubes connecting the nozzles with the filling valves, and means for operating said supplemental frame to move the filling tubes to and from filling position.

2. In a filling machine of the character described, the combination of a horizontal frame adapted to support a crate of packages to be filled, an upright frame, a plu-

35 rality of measuring cylinders supported on the upright frame, a valve at the bottom of each cylinder and having a plurality of ports and passages therein, a header connected to the supply holder for the material and to all the valves, another header connected to an air pressure supply and to all the valves, and means for operating all the valves simultaneously to admit the material to the cylinders and permit the air therein to escape or to admit air under pressure to force the material out of the cylinders.

3. In a filling-machine of the character described, the combination of a horizontal frame adapted to support a package to be filled, an upright frame, a measuring cylinder supported on the upright frame, a piston in said cylinder, a multiple passage valve located at the bottom of the cylinder, air pressure supplying means connected to said valve, and means for actuating said valve whereby to simultaneously admit material under pressure to the measuring cylinder below the piston and relieve the pressure above the piston, and to subsequently admit air under pressure to the cylinder above the piston and simultaneously relieve the pressure below the piston whereby the material will be discharged from the cylinder.

EMER H. PARKER.

In presence of—

K. M. CORNWALL,
R. A. SCHAEFER.