No. 744,048. PATENTED NOV. 17, 1903.

A. CERRUTI.

CAN FILLING MACHINE.

APPLICATION FILED JUNE 3, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

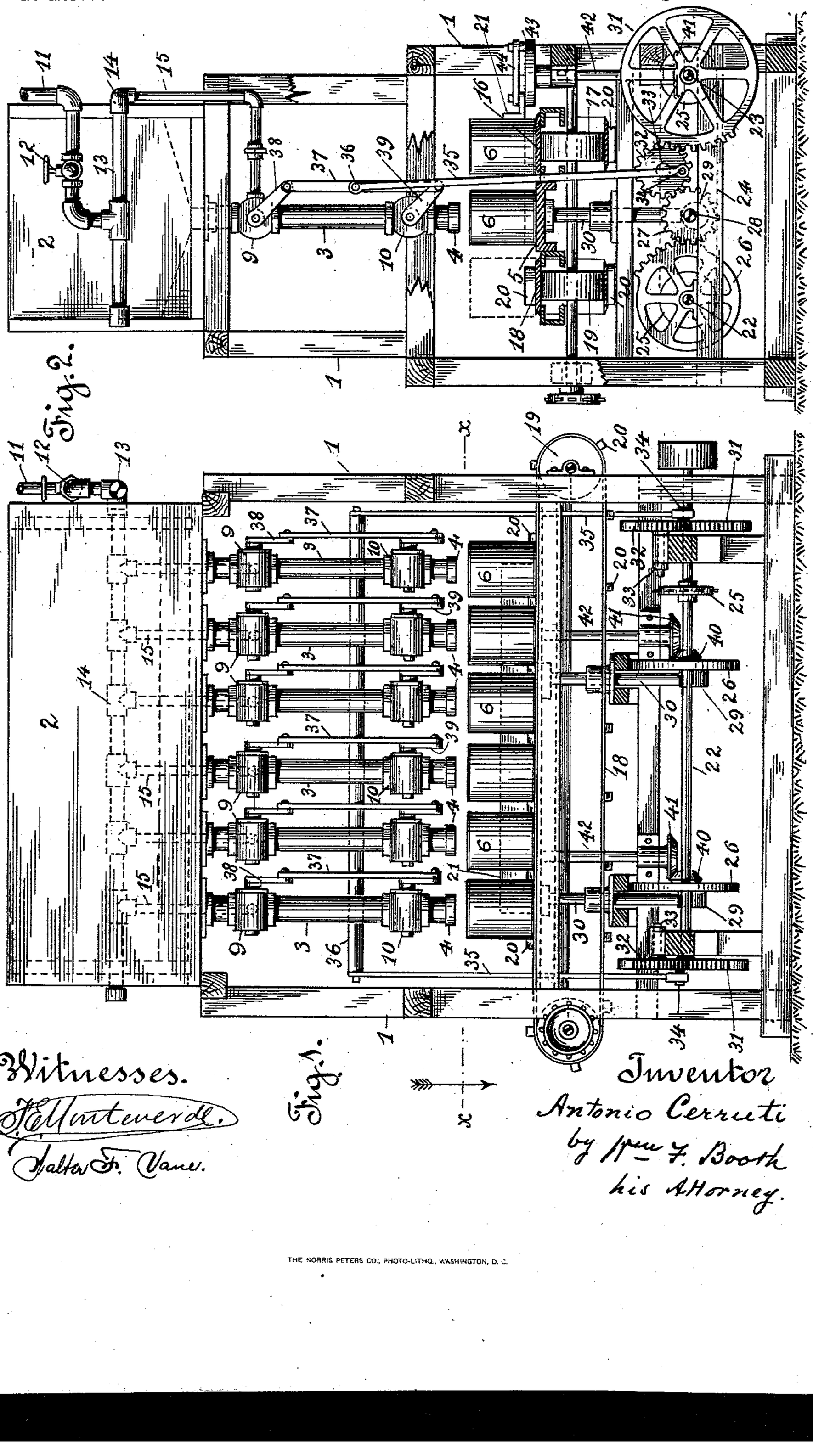

Fig. 2.

Fig. 1.

Witnesses.

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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 3.

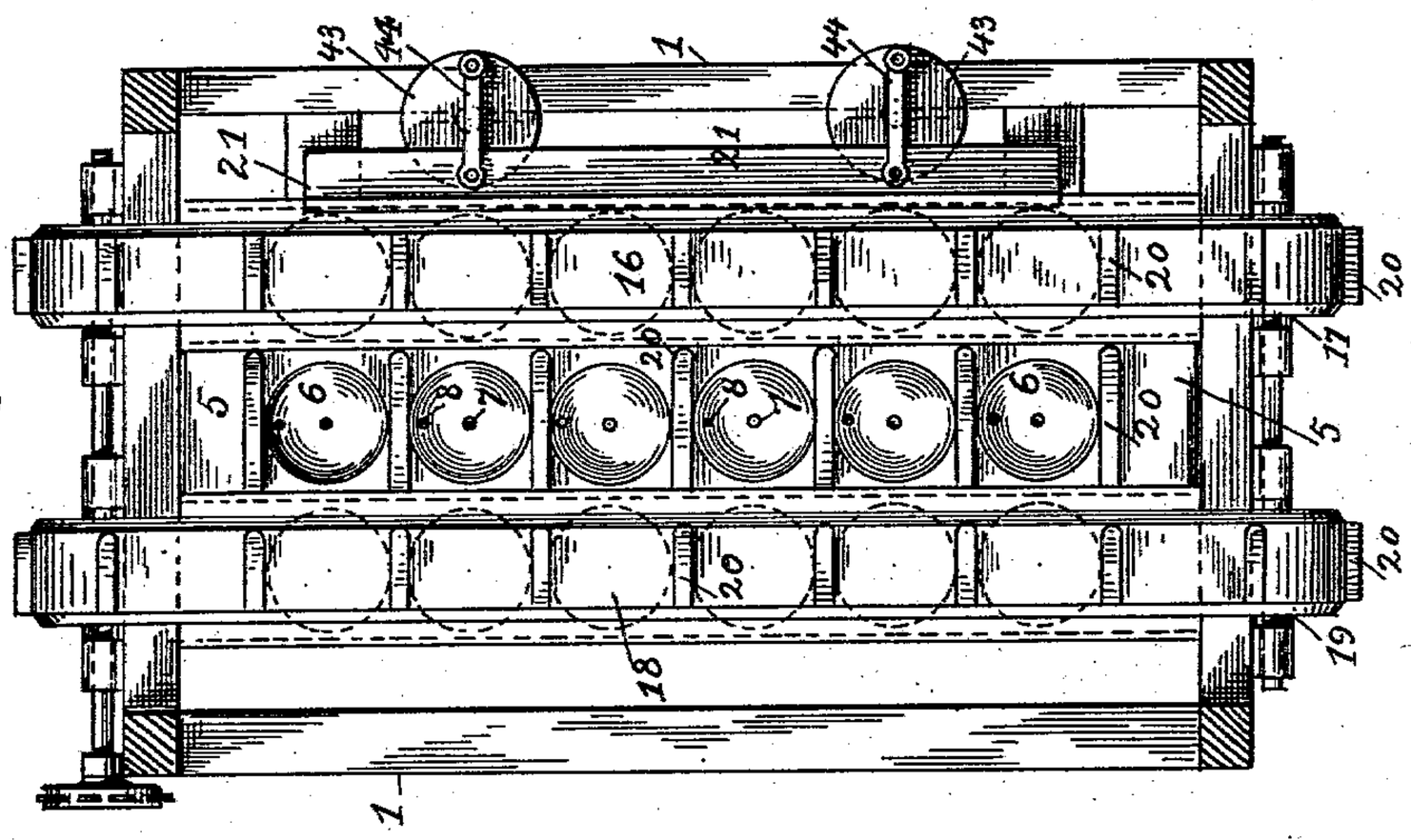


Fig. 4.

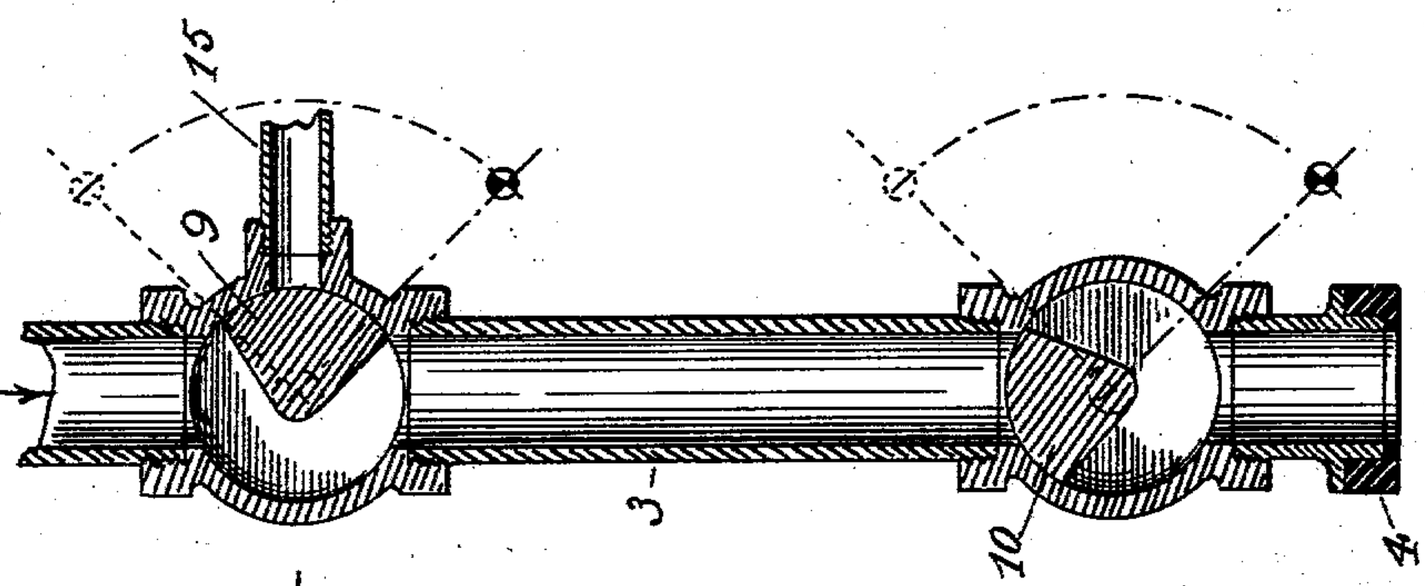


Fig. 5.

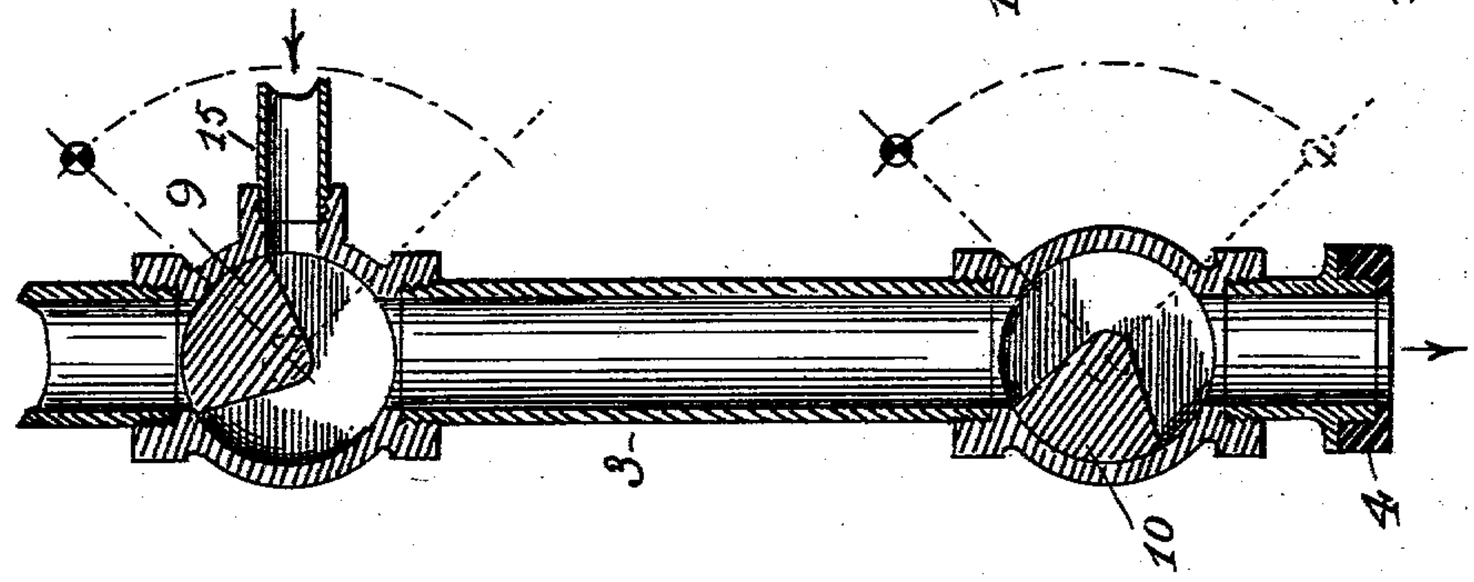
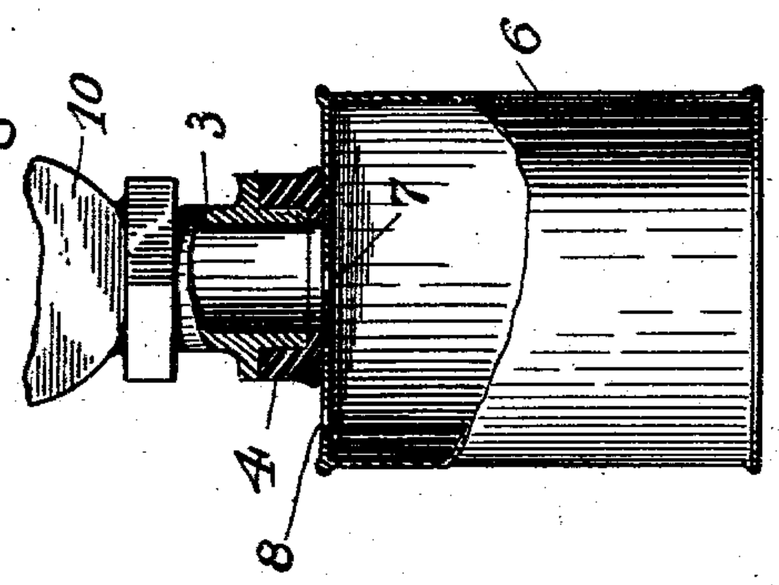


Fig. 6.



Witnesses.

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No. 744,048. Patented November 17, 1903.

UNITED STATES PATENT OFFICE.

ANTONIO CERRUTI, OF SAN FRANCISCO, CALIFORNIA.

CAN-FILLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 744,048, dated November 17, 1903.

Application filed June 3, 1903. Serial No. 159,891. (No model.)

To all whom it may concern:

Be it known that I, ANTONIO CERRUTI, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented certain new and useful Improvements in Can-Filling Machines; and I do hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to the class of machines or apparatus used for supplying liquids to cans. These machines, though applicable to the filling of cans with any liquid, whether the liquid alone is to fill the cans or to supplement material of any nature already in the cans, are specially intended for use in fruit-canneries to supply the necessary syrup to the fruit previously packed in the cans, and are commonly known as "syruping-machines."

In a previous patent granted to me May 18, 1886, No. 341,996, I have shown a form of can-filling apparatus in connection with which I describe what was then a departure from the common mode of operation respecting the order or sequence of manipulations in filling the cans. The common practice then was and largely still is to insert the fruit through a cap-opening made in the head of the can, which head had been previously seated and, soldered on the can. The syrup was subsequently supplied through this same cap-opening, which to admit the fruit had to be of considerable diameter; but even so the fruit could not be inserted in good shape, and, again, the large opening had to have a large cap, requiring time to solder, expense in material, and a more or less doubtful seal. The departure spoken off as disclosed in my patent mentioned above consisted in filling the fruit into the can before the head was applied, said head having only two very small openings in it, one to receive the syrup and the other to allow the air to escape. The can was then raised up to form a close communication of its small filling-hole with the delivery-faucet of the filling-machine, and the syrup passed in through said opening to the can, the air passing out through the exposed vent. Then a touch of the soldering-iron served to seal the small holes. My former machine was adapted for a method of this character, and it is to this method that my present invention is especially applicable, the objects being to facilitate the entrance of the syrup through the small filling-hole, to measure the liquid charge delivered in order to insure the proper filling of the can, to rapidly feed the cans to be filled, and to deliver quickly those which have been filled, and generally to provide a simple and efficient machine of this class.

To these ends my invention consists in the novel construction, arrangement, and combinations of parts, which I shall hereinafter describe and claim by reference to the accompanying drawings, in which—

Figure 1 is a back view of my machine. Fig. 2 is an end view, partly in section. Fig. 3 is a top view on the line *x x* of Fig. 1. Fig. 4 is a sectional view showing the positions of the controlling-valves in filling the delivery-tubes. Fig. 5 is a view showing the positions of the valves when delivering the liquid charge to the cans. Fig. 6 is a broken sectional detail of a can and the end of the delivery-tube with which it forms a close communication.

The frame 1 of the machine is a suitable structure supporting at its top the supply-tank 2, which may receive its liquid from any suitable source.

3 represents the delivery-tubes, of which there may be as many as desired. The upper end of each tube communicates with the tank 2, and its lower end has a washer or gasket 4 to form a tight joint with the can when the latter is raised up to it.

5 is the vertically-movable can-table on which are supported the cans 6, each can having in its head, as seen in Figs. 3 and 6, a small filling-hole 7 and an air-vent 8. When the table 5 is raised, each can is pressed up against the washer 4 of the overlying discharge end of the delivery-tube 3 in such a manner and so tightly, as seen in Fig. 6, that its filling-hole 7 communicates with the tube, but is made air-tight by the surrounding washer; but the air-vent hole 8 is left free to the atmosphere.

Each delivery-tube is controlled and is rendered a measurer of a stated charge by means of an upper valve 9 and a lower valve 10, the two valves leaving the tube between them of a capacity suited to the needs of the can to

be filled. These valves are relatively arranged to operate oppositely—that is, when the upper valve is open to admit the liquid to the tube the lower valve is closed to retain the liquid thus admitted, as seen in Fig. 4, and when the upper valve is closed to cut off the supply of liquid the lower valve is open to deliver the charge in the tube to the underlying can, as seen in Fig. 5.

As I have heretofore intimated, the filling-hole 7 in the can is purposely made small, so that it can be closed easily by a light touch of solder. On account of the smallness of this hole the filling of the can by the gravity of the liquid alone is not as rapid as it should be. To accelerate this filling operation, I assist the hydrostatic pressure and gravity by means of a positive pneumatic pressure derived either through a previous exhaust of the air in the can itself, as I have shown in a contemporaneously-filed application for a patent, or by compressed air on top of the charge-column as I show in the present case. The means for securing this latter pressure comprise an air-pipe 11, which proceeds from a suitable air-compressor, unnecessary herein to show. This pipe may be controlled by a cock 12, and is connected by a pipe 13 on the end of the frame outside one end of the tank 2 with a pipe 14, which lies along the front of the tank. From this pipe 14 branches 15 extend down to and communicate with each of the delivery-tubes 3 through the control of the upper valves 9 of said tubes. This communication is such, as shown in Fig. 4, that when the valve 9 is open to permit the charge to enter the tube the air-entrance is closed by said valve; but as soon as valve 9 is closed to cut off the liquid and the lower valve 10 is opened to deliver the charge to the can the air-entrance is open also, as shown in Fig. 5, and the compressed air acts on top of the liquid charge or column and forces it down rapidly into the can. Then when the lower valve is closed and the upper valve is opened for a fresh charge the air communication is closed, as in Fig. 4. This pneumatic pressure serves another important function. The charge-tube has a capacity sufficient to fill the can; but in practice the can should be slightly less than full before being finally sealed. The compressed air therefore not only insures the delivery of all the liquid in the charge-tube to fill the can, but serves also to positively blow out a sufficient quantity of the liquid through the vent-hole 8 in the can to properly reduce its level therein. Time is thus saved in the filling, and the cans are properly supplied with the required amount of syrup or liquid.

In order to increase the efficiency of the machine in point of time, I have a continuous operation of presenting the cans, of filling them, and of delivering them when filled.

Running lengthwise of the machine, in front of the can-table, is a horizontal endless carrier 16, mounted on terminal pulleys 17 and driven by suitable mechanism, unnecessary to show. The upper run of this carrier is level with the can-table, so that the cans may be pushed from one to the other. Back of the table is a similar carrier 18, mounted on terminal pulleys 19 and having its upper run level with the table. On each carrier and on the table are cross-guides 20, Fig. 3, which when alined afford cross-passages for the cans. Now after a batch of cans have been fed to carrier 16, which I will call the "feed-carrier," and the carrier has been moved to its proper position relatively to the can-table 5 a push-bar 21 comes up to said cans and pushes them all over onto the table 5 and thereupon withdraws. Then while the table is raised and the cans are being filled a second batch of cans are supplied to the feeding-carrier. By this time the table has returned with the filled cans, and thereupon the push-bar, operating against the second batch of cans, pushes them over to the table, and in so doing causes said second cans to push the first cans over onto the back carrier 18, which I shall call the "delivery-carrier." Then while the second cans are being filled the delivery-carrier carries off the first cans, and the feed-carrier receives a third batch of cans, and so on continuously. The several power-transmitting connections and devices will now be readily understood.

In the base of the frame are two longitudinal shafts 22 and 23, one behind and one in front, united by chains 24 and sprockets 25 to cause them to operate in unison, one of said shafts receiving the power.

Upon shaft 22 near each end is a segment-gear 26, which gears mesh with pinions 27 on a counter-shaft 28, said shaft having cams 29, which operate the lifting-rods 30, which support the table 5. By these means the table is vertically moved to lift the cans to and lower them from the delivery-tubes.

Upon shaft 23 near each end is a segment-gear 31, which gears mesh with pinions 32 on a counter-shaft 33, said pinions having crank-pins 34, with which are connected rods 35, the upper ends of which have connected to and extending between them a rail 36, passing in front of the series of delivery-tubes. To this rail 36 are connected the several links 37, one for each delivery-tube, said links being each connected above with a valve-handle 38 of the upper valve 9 of each tube and below with a valve-handle 39 of the lower valve 10 of each tube. Thus the valves which control and measure the charge are operated.

Upon shaft 23 near each end are pinions 40, which mesh with pinions 41 on the lower ends of vertical rotary shafts 42, the heads 43 of said shaft carrying links 44, which connect with and operate the push-bar 21.

The operation of the machine is as follows: The cans previously supplied with the solid fruit and headed are placed on the feed-carrier 16 between its cross-guides 20, and when said carrier has advanced to position it stops. The push-bar 21 then moves all the cans over

to the table 5, whereupon said table rises and carries the cans up into close contact and communication with the lower ends of the delivery-tubes 3. The syrup or liquid having previously flowed down into said tubes remains therein in stated charges, resting on the lower valves 10. Now the lower valves open, the upper valves 9 close to the liquid and open to the compressed air. The charge of syrup or liquid is thus forced down through the filling-hole 7 of each can, the air escaping through the vent 8, and finally the surplus liquid being blown out through said vent. Then the valves reverse, the lower valves closing and the upper valves opening to the liquid and closing to the compressed air, and the can-table descends. Meanwhile, a fresh batch of cans having been fed to carrier 16, the push-bar 21 pushes said cans over to the table, thereby pushing the previous cans from the table over to the delivery-carrier 18. Then while the latter is carrying the filled cans off and the feed-carrier is receiving a third batch to be filled the second batch is being filled, and thus the operations continue.

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

1. In a can-filling machine the combination of a delivery-tube, an underlying can-table, means for effecting a close communication between the lower end of said tube and the filling-opening in the can, valves in said tube to receive, measure and deliver a stated liquid charge, and a pipe from a source of compressed air, said pipe communicating with the upper portion of the delivery-tube, to introduce compressed air on top of the liquid charge in said tube.

2. In a can-filling machine the combination of a delivery-tube having its upper end in communication with a source of liquid-supply, an underlying can-table, means for effecting a close communication between the lower end of said tube and the filling-opening in the can, a valve in the upper portion of the tube, and a valve in the lower portion of the tube said valves relatively operating to receive, measure and deliver a stated liquid charge, and a pipe from a source of compressed air, said pipe communicating with the tube and its communication controlled by the upper valve in such manner as to admit the compressed air to the top of the liquid charge while being delivered to the can.

3. In a can-filling machine, the combination of a vertically-movable can-table, an overlying delivery-tube, having its lower end adapted to form a close communication with the can-filling opening when the can is raised by its table, and its upper end having communication with a source of liquid-supply, valves in said tube to receive, measure and deliver a stated liquid charge, and a pipe from a source of compressed air, said pipe communicating with the upper portion of the delivery-tube, to introduce compressed air on top of the liquid charge in said tube.

4. In a can-filling machine, the combination of a vertically-movable can-table, an overlying delivery-tube, having its lower end adapted to form a close communication with the can-filling opening when the can is raised by its table, and its upper end having communication with a source of liquid-supply, a valve in the upper portion of the tube and a valve in the lower portion of the tube said valves relatively operating to receive, measure and deliver a stated liquid charge, and a pipe from a source of compressed air, said pipe communicating with the tube and its communication controlled by the upper valve in such manner as to admit the compressed air to the top of the liquid charge while being delivered to the can.

5. In a can-filling machine, the combination of a vertically-movable can-table, a liquid-tank above, an intervening delivery-tube adapted to receive the liquid from the tank and to deliver it to the can when the latter is raised by its table to form a close communication with the lower end of the tube, the relatively oppositely working upper and lower valves in the tube to receive, measure and deliver a stated liquid charge to the can, a pipe from a source of compressed air, said pipe communicating with the tube and its communication controlled by the upper valve in such manner as to admit the compressed air to the top of the liquid charge as the latter is being delivered to the can, and the means for operating the valves consisting of the handles, the connecting-link thereof and power-transmitting connections to raise and lower the link.

6. In a can-filling machine, the combination of a vertically-movable can-table, delivery-tubes above, having an upper and a lower valve to receive, measure and deliver stated liquid charges to the cans when raised by the table to a close communication with the lower ends of the tubes, means for applying pneumatic pressure to the charges in the tubes to assist the delivery of said charges to the cans, a movable feeding-carrier on one side of the can-table, a movable delivery-carrier on the other side of said table, and a push-bar acting against the cans on the feeding-carrier to move them over to the can-table and by the contact of said cans with the cans already on the table to force the latter over to the delivery-carrier.

7. In a can-filling machine, the combination of a vertically-movable can-table, delivery-tubes above, having an upper and a lower valve to receive, measure and deliver stated liquid charges to the cans when raised by the table to a close communication with the lower ends of the tubes, pipes from a source of compressed air, said pipes communicating with the tubes at their upper valves to apply pressure to the liquid charges, a movable feed-

ing-carrier on one side of the can-table, a movable delivery-carrier on the other side of said table, and a push-bar acting against the cans on the feeding-carrier to move them over to the can-table and by the contact of said cans with the cans already on the table to force the latter over to the delivery-carrier.

In witness whereof I have hereunto set my hand.

ANTONIO CERRUTI.

Witnesses:
WALTER F. VANE,
HARRY J. LASK.