No. 795,040. PATENTED JULY 18, 1905.

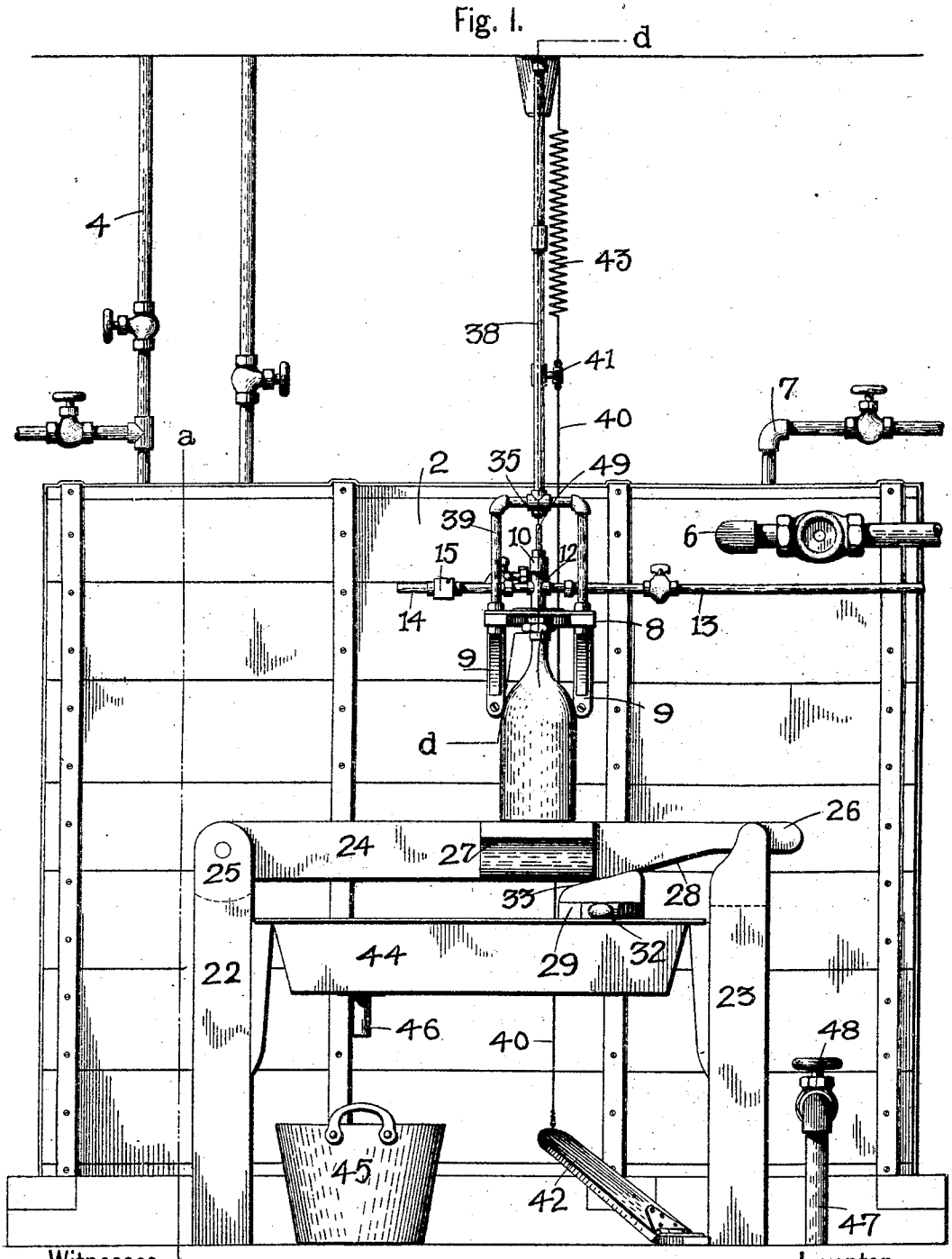
C. A. HOPKINS.

APPARATUS FOR BOTTLING LIQUIDS.

APPLICATION FILED DEC. 4, 1903.

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses.

L. M. Sangster.

Geo. A. Neubauer.

a

Inventor.

Charles A. Hopkins.

By

A. J. Sangster. Attorney.

ANDREW B. GRAHAM CO., PHOTO-LITHOGRAPHERS, WASHINGTON, D. C.

No. 795,040. PATENTED JULY 18, 1905.

C. A. HOPKINS.

APPARATUS FOR BOTTLING LIQUIDS.

APPLICATION FILED DEC. 4, 1903.

3 SHEETS—SHEET 2.

Fig. 2.

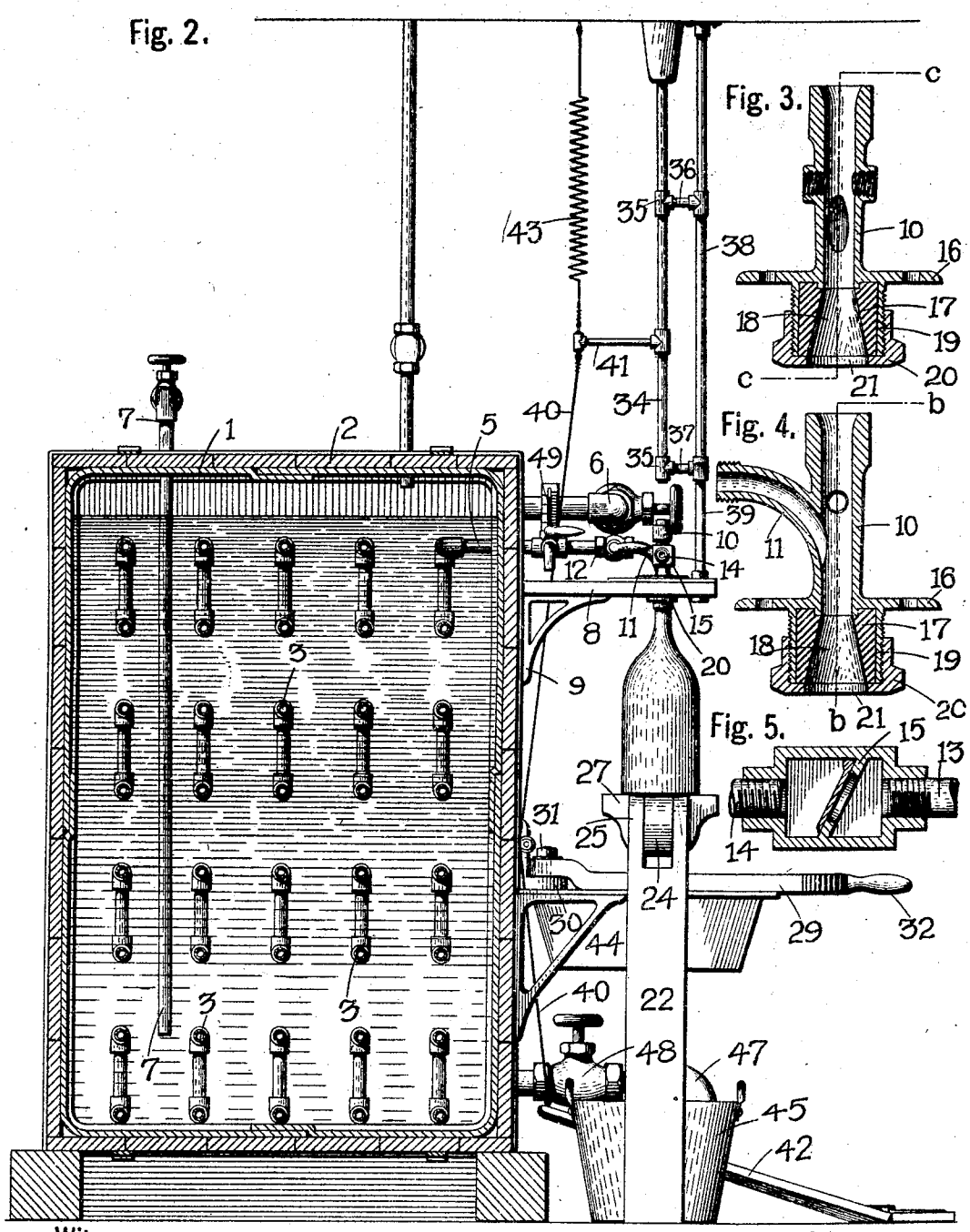


Fig. 3.

Fig. 4.

Fig. 5.

Witnesses.

L. M. Sangster.

Geo. A. Neubauer.

Inventor.

Charles A. Hopkins.

By A. J. Sangster.

Attorney.

ANDREW B. GRAHAM CO., PHOTO-LITHOGRAPHERS, WASHINGTON, D. C.

No. 795,040. PATENTED JULY 18, 1905.

C. A. HOPKINS.

APPARATUS FOR BOTTLING LIQUIDS.

APPLICATION FILED DEC. 4, 1903.

3 SHEETS—SHEET 3.

Fig. 7

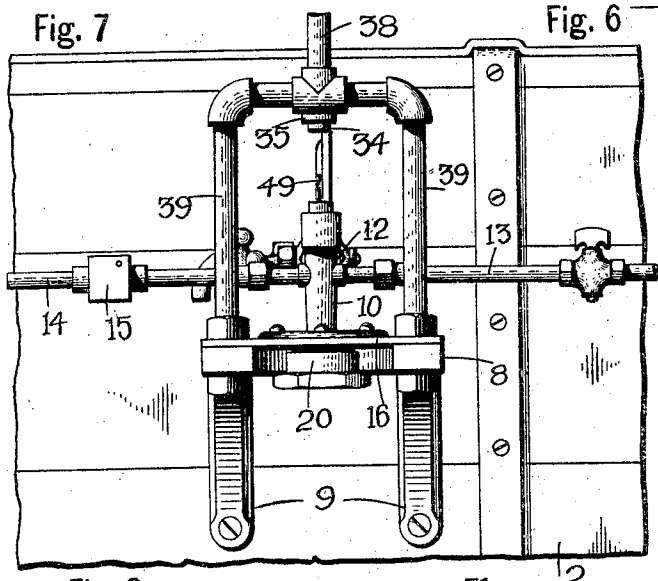


Fig. 6

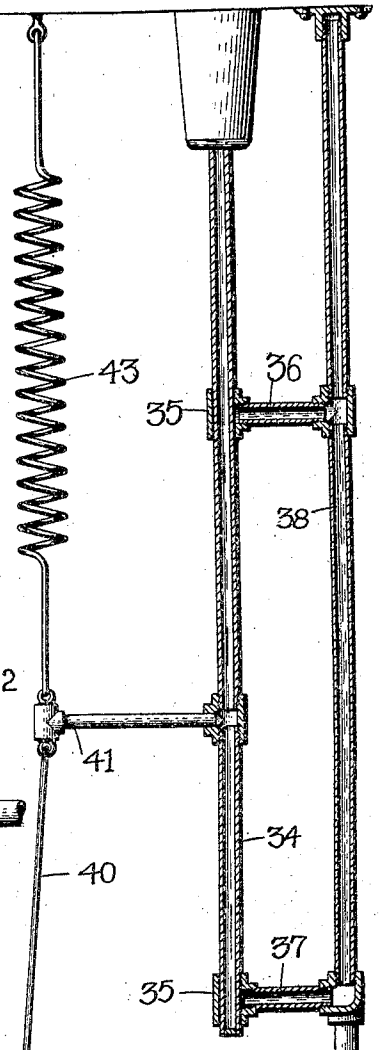


Fig. 8.

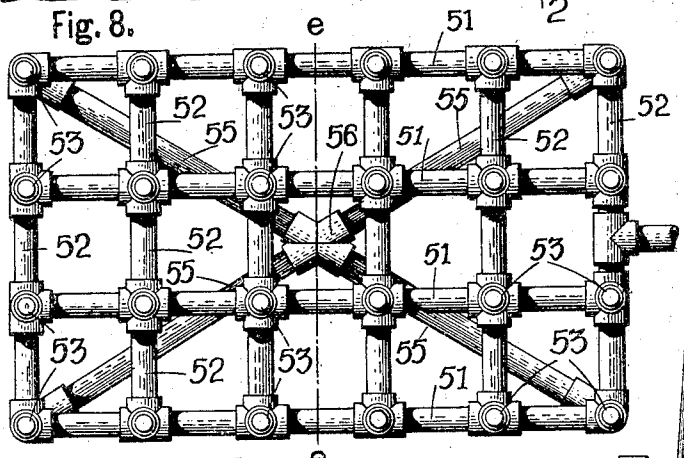
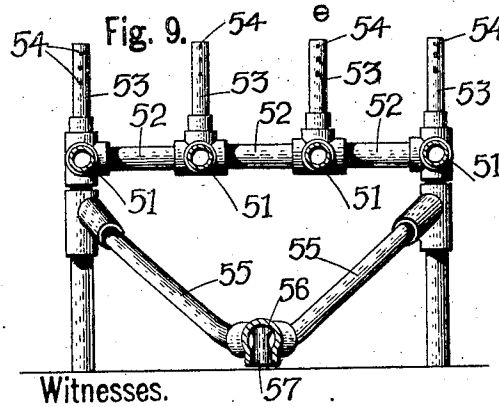
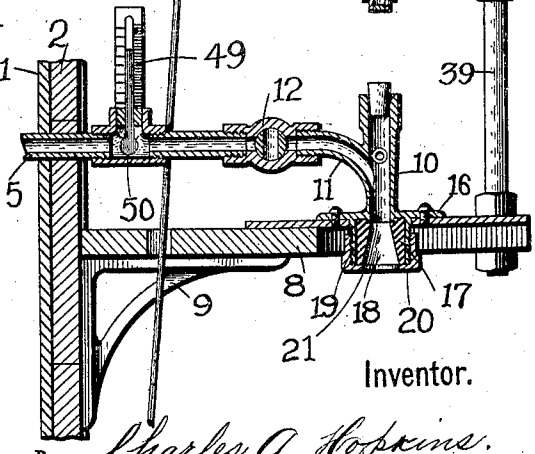


Fig. 9.





Witnesses.

L. M. Sangster.

Geo. A. Neubauer.

Inventor.

Charles A. Hopkins.

By A. J. Sangster Attorney.

ANDREW B. GRAHAM CO., PHOTO-LITHOGRAPHERS, WASHINGTON, D. C.

No. 795,040. Patented July 18, 1905.

UNITED STATES PATENT OFFICE.

CHARLES A. HOPKINS, OF FREDONIA, NEW YORK.

APPARATUS FOR BOTTLING LIQUIDS.

SPECIFICATION forming part of Letters Patent No. 795,040, dated July 18, 1905.

Application filed December 4, 1903. Serial No. 183,781.

To all whom it may concern:

Be it known that I, CHARLES A. HOPKINS, a citizen of the United States, residing at Fredonia, in the county of Chautauqua and State of New York, have invented a certain new and useful Apparatus for Bottling Liquids, of which the following is a specification.

This invention relates to an improved apparatus for sterilizing and bottling liquids and juices—such, for instance, as grape-juice; and it consists in killing or deadening the germs in the liquid or juice, and thereby destroying or suspending fermentation, and filling bottles which have been previously sterilized with the liquid or juice in such a manner as to prevent contamination either of the liquid or juice or the interior surface of the bottle by the surrounding atmosphere, from which the liquid or juice and also the interior surface of the bottle and filling-tube are isolated during the passage of the liquid into the bottle by means of dry steam or in some other suitable manner.

The object of the invention is to bottle liquids, juices, or the like in a perfectly-sterilized condition and so as to prevent or suspend fermentation, and thereby enable the preservation of the bottled liquid or juice indefinitely.

The invention will be fully and clearly hereinafter described and claimed, reference being had to the accompanying drawings, in which a preferred adaptation of the invention is shown.

Figure 1 is a front elevation of the improved apparatus. Fig. 2 is a side elevation with the heating-tank shown in section on line *a a*, Fig. 1. Fig. 3 is an enlarged horizontal section through the filling-shell on line *b b*, Fig. 4. Fig. 4 is an enlarged longitudinal section through the filling-shell on line *c c*, Fig. 3. Fig. 5 is an enlarged section through the automatic leaf-valve in the exhaust-steam pipe. Fig. 6 is an enlarged view, nearly in longitudinal section, of the bottle filling and corking mechanism. Fig. 7 is an enlarged fragmentary front elevation of the bottle filling and corking mechanism, also showing a fragment of the heating-tank to which the shelf supporting said mechanism is attached. Fig. 8 is a top plan view of a device for preliminarily heating the bottles before they are placed in position to be filled. Fig. 9 is a section on line *e e*, Fig. 8.

In referring to the preferred adaptation illustrated in the accompanying drawings for the details of construction like numerals designate like parts.

The invention consists of a heating-receptacle through which the liquid or juice is conducted in pipes to thoroughly sterilize the same, a bottle-support, means for filling the bottles with the liquid or juice, and mechanism for corking the bottles. The apparatus may also be equipped with a steam cleaning and sterilizing device for bottles, such as shown in Figs. 8 and 9. The heating-receptacle is preferably a closed tank having an inner metal lining 1 and an outer casing 2 of wood or other suitable material. A plurality of coils of piping 3 are arranged in the tank through which the liquid or juice is conducted for the purpose of thoroughly sterilizing the same. These pipes are connected at one extremity to a vertical pipe 4, which extends through the top of the tank to a source of liquid-supply and at the opposite extremity to a horizontal pipe 5, which extends through the side of the tank and connects to a bottle-filling device.

The heating-tank is nearly filled with water, as shown in Fig. 2, by means of a water-supply pipe 6, which connects to the upper portion of the tank, and the water is heated sufficiently to sterilize the liquid or juice by a steam-pipe 7, which has an open end extending within the tank. (See Fig. 2.)

A shelf 8 is supported from one side of the heating-tank by brackets 9, and a bottle filling and corking device is mounted upon this shelf.

The bottle filling and corking device consists of a vertical tubular element or filling-shell 10, which has a curved tubular portion 11, connected by a valved coupling 12 to the outer end of the pipe 5, a steam-pipe 13 for introducing live steam into the shell 10, an exhaust-steam pipe 14, connecting to the opposite side of the shell and having an automatic leaf-valve 15, substantially as shown in

Fig. 5, and a means for forcing a cork through the shell 10 into the bottle-neck. The shell 10 has a flange 16, which is bolted to the top of the shelf 8, the shelf being cut away sufficiently to provide a space for the passage of the depending lower portion of the device. A rubber ring 17 is supported between the lower end of the shell 10 and has a central tapering opening 18, into which the top of a bottle is adapted to be fitted. The ring 17 is held in place in a short cylindrical tube 19 by a screw-cap 20, which screws upon the tube and has a central opening 21 of sufficient size for the passage of the bottle-neck. The tube 19 is preferably integral with the shell, as shown in Figs. 3 and 4, and projects downward from the flange 16.

A support for a bottle is arranged beneath the shelf 8 at a suitable distance therefrom, so that it can be elevated or depressed to force the bottle-neck into the ring 17 or remove it therefrom. This support consists of two uprights 22 and 23 (see Fig. 1) and a substantially horizontal cross-bar 24, which is pivoted at one end between the forks of the bifurcated upper end 25 of the upright 22 (see Fig. 2) and has a handle 26 (shown in Fig. 1) at the opposite end. The portion of the cross-bar upon which the bottle is directly supported is widened by ledges 27, attached to the opposite sides thereof, so that the cross-bar part immediately beneath the bottle is wider than the bottle (see Figs. 1 and 2) to afford a firmer support for the bottle-base. The lower surface of that portion of the cross-bar immediately adjacent to the handle is inclined, as shown at 28 in Fig. 1, and a lever 29, which is pivoted at its inner end to a lug 30, projecting from the heating-tank, by a pin 31 and has a handle 32 at its outer end, is provided with a corresponding inclined top surface 33, which as the lever is moved in one direction presses against the inclined surface 28 and raises the cross-bar sufficiently to force the neck of the bottle supported thereon firmly into the tapering opening in the ring 17.

The cork is forced into the bottle by a vertical rod 34, which is slidably supported by rings or sleeves 35, mounted on outer ends of upper and lower horizontal rods 36 and 37, which project from and are rigidly attached at their opposite ends to a vertical bar or rod 38. This bar or rod 38 is held rigidly in vertical position by fastening its upper end to the ceiling and its lower end, which is forked, as shown at 39 in Fig. 1, to the shell 8.

The rod 34 is drawn downward to force the cork through the filling-shell and into a bottle by a wire or cord 40, which is connected at its upper end to a horizontal arm 41, extending from the rod 34, (see Fig. 2,) and at its lower end to a foot-treadle 42.

To normally maintain the rod 34 in an elevated position and to return it to said position when depressed upon releasure of the treadle 42, a spring 43 is connected at one end to the arm 41 and at the opposite end to the ceiling of the room in which the apparatus is located or any other suitable place.

A drip pan or sink 44 is supported between the uprights 22 and 23 for the purpose of catching the dripping or overflow from the bottles. An ordinary pail 45 is preferably placed beneath the outlet-pipe 46 of the drip-pan 44. A drain-pipe 47, having a shut-off cock 48, is provided to enable the water to be drawn from the heating-tank.

49 represents a thermometer, which is connected to the feed-pipe leading from the heating-tank, with its bulb 50 arranged directly in the passage of the liquid or juice to enable the exact temperature of the same to be readily ascertained.

It is generally advisable to preliminarily heat and sterilize the bottles, for which purpose I prefer the device shown in Figs. 8 and 9, which consists of a plurality of longitudinally-extending steam-pipes 51 and transversely-extending steam-pipes 52, said pipes being arranged so that they cross each other at substantially right angles, and a series of vertical pipes 53, which extend up from the crossing-points of said pipes 51 and 52. Each vertical pipe 53 has its top closed and is provided with a series of side openings or outlets 54 near its upper end.

In practice the preliminary bottle-heater is arranged at a suitable point in the plant in proximity to the filling mechanism, and a series of bottles are placed in inverted position over the vertical pipes 53. To remove the condensation, drain-pipes 55 extend diagonally down from the corners of the steam-pipe system and connect at their lower end to a common or central four-way-pipe connection 56, which has a lower or bottom opening 57, and is arranged above or connected to a suitable drain.

The operation of the preferred form of this apparatus is as follows: A bottle is placed on the widened portion of the cross-bar, with its neck centrally or approximately beneath the flaring or conical opening in the ring 17. The cross-bar is now elevated by the lever 29, forcing the bottle-neck into the conical opening 18 in the ring 17. The steam from the steam-pipe 13 immediately fills the interior of the bottle and additionally heats and sterilizes the same. The proper valve is now opened and the heated liquid or juice passes from the heated coils in the tank through the pipe 5, curved portion 11, and shell 10 into the bottle. When the bottle is sufficiently filled with liquid or juice, the foot-treadle 42 is depressed, which moves the rod 34 downward and forces a cork through the shell 10 into the mouth of the bottle, thereby securely corking it.

In this improved apparatus the filling-shell, as before described, is connected with a steam-pipe 13 and has an outlet or exhaust pipe 14

into the atmosphere, so that steam fills the filling-shell and bottle and perfectly isolates the liquid from the atmosphere as it flows from the coils through the filling-shell into the bottle, besides continuing the sterilizing of the liquid to and within the bottle. The cork is likewise sterilized as it is forced through the steam in the filling-shell and into the bottle-mouth. As the bottle fills the surplus steam displaced by the liquid escapes through the outlet, which is, as before noted, provided with a valve which prevents the entrance of air without obstructing the outward passage of steam.

The great advantage of this invention is that the steam perfectly sterilizes the interior of the filling-shell and the bottles are perfectly sterilized by the steam therein, the liquid or juice is completely isolated during its passage into the bottle, and the cork used to close the bottle is sterilized by passing through the steam in the filling-shell before inserting it in the bottle-mouth. This produces a positive sterilized condition of the liquid, the liquid-contacting surfaces of the apparatus, and the bottle and its cork.

I claim as my invention—

1. An improved apparatus for bottling liquid consisting of a sterilizing-tank, means for heating said tank, means for conducting liquid through said tank, a filling-shell connecting to the conducting means and having a member which is adapted to engage a bottle, a pipe connecting to the filling-shell for filling the shell and bottle with sterilizing material and means for forcing a cork through the shell into the bottle, substantially as set forth.

2. An improved apparatus for bottling liquid consisting of a sterilizing-tank, means for heating said tank, pipe-coils for conducting liquid through said tank, a filling-shell connecting to the pipe-coils and having a lower tapering member into which the neck of a bottle is adapted to be fitted, a steam-pipe connecting to the filling-shell for filling the shell and bottle with sterilizing-steam and means for forcing a cork through the shell and sterilizing-steam into the bottle, substantially as set forth.

3. In a bottling apparatus, the combination with a liquid-sterilizing means and a vertical filling-shell connected to said sterilizing means into which the neck of a bottle fits, of means for filling a bottle with sterilizing material, such as steam, means for forcing sterilized liquid, such as grape-juice, into said bottle, means for forcing a cork through the filling-shell and the sterilizing material therein into a filled bottle including a vertical slide-rod and mechanism for moving said rod downward and spring means for normally maintaining said rod in elevated position.

4. In a bottling apparatus, the combination with a liquid-sterilizing means and a vertical filling-shell connected to said liquid-sterilizing means into which the neck of a bottle fits, of means for filling a bottle with sterilizing material, such as steam, means for forcing a cork through the filling-shell and the sterilizing material contained therein into a filled bottle including a vertical rod, a foot-treadle and a wire connecting the foot-treadle to the rod, substantially as set forth.

5. An improved apparatus for bottling liquid consisting of a sterilizing means, a vertical filling-shell having connection to said sterilizing means, a bottle-support beneath the filling-shell, comprising a plurality of uprights, a horizontal cross-bar pivoted to one of said uprights and having its lower surface inclined at least in part and a lever having an inclined surface adapted to coact with the inclined surface of the cross-bar, substantially as set forth.

CHARLES A. HOPKINS.

Witnesses:
H. L. HOLCOMB,
C. H. BAKER.