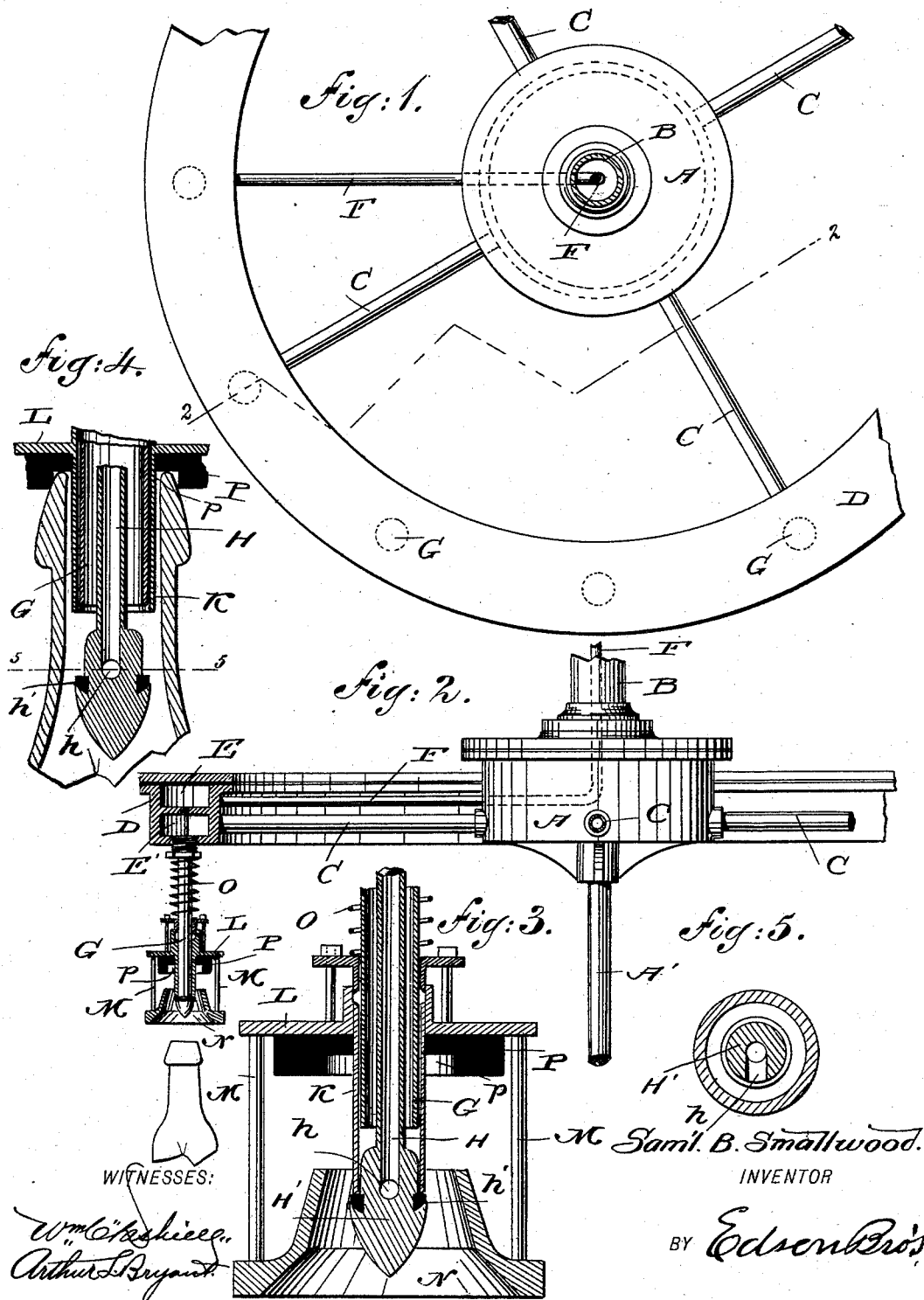


(No Model.)

S. B. SMALLWOOD.
BOTTLE FILLING APPARATUS.

No. 523,014.

Patented July 17, 1894.



UNITED STATES PATENT OFFICE.

SAMUEL B. SMALLWOOD, OF LONG ISLAND CITY, NEW YORK.

BOTTLE-FILLING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 523,014, dated July 17, 1894.

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To all whom it may concern:

Be it known that I, SAMUEL B. SMALLWOOD, a citizen of the United States, residing at Astoria, Long Island City, in the county of Queens and State of New York, have invented certain new and useful Improvements in Bottle-Filling Apparatus; and I do hereby 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 present invention relates to improvements in bottle filling apparatus of the class shown and described in my former applications, filed January 13, 1893, and May 13, 1893, and bearing Serial Nos. 458,282 and 474,088, respectively, and the object of the present invention is to provide a more simple and compact apparatus for this purpose than that shown in the applications referred to.

With these ends in view my invention consists in the peculiar construction and arrangement of parts as will be hereinafter fully pointed out and claimed.

In the accompanying drawings—Figure 1 is a top plan view of a portion of the apparatus. Fig. 2 is a vertical sectional view on the line 2—2 of Fig. 1. Fig. 3 is an enlarged sectional view through one of the filling tubes or faucets and its attached bottle guide. Fig. 4 is an enlarged detail sectional view showing one of the filling tubes in position in a bottle; and Fig. 5 is a transverse sectional view on the line 5—5 of Fig. 4.

Like letters of reference denote corresponding parts in the several figures of the drawings, referring to which—

A designates a suitable tank or receptacle which is mounted on a suitable support A' and connected, by means of a pipe or tube, B, with a cask or other source of liquid supply.

The tank and support are not shown in the present case as they form no part of this invention, and as they and the connection between the cask and tank A are fully shown in my prior applications hereinbefore referred to.

The inner ends of radially extending supply pipes C are screwed into internally threaded

apertures in the side walls of the tank A and these supply pipes, of which there are preferably four as shown in the drawings, communicate at their outer ends with the interior of a receptacle or "filling ring," D, which is arranged concentric with the tank A.

The "filling ring" D, which is supported by the radially extending supply pipes C, is interiorly divided into two independent compartments or chambers, E, E', by means of a central horizontal partition D'. The outer ends of the radially extending supply pipes enter the lower compartment or chamber E' of the filling ring D and connect said chamber with the central tank A which, as hereinbefore described, is connected with a suitable source of liquid supply. The upper chamber E of the filling ring is connected with the source of supply of the apparatus, above the liquid therein, by a pipe or tube F.

The filling ring is provided at regular intervals with depending filling tubes G which communicate at their upper ends with the liquid chamber E' of said ring. The upper ends of the filling tubes are rigidly attached to the "filling ring," being preferably screwed into internally threaded openings therein, and centrally within each filling tube is arranged an air tube H which extends through the filling tube and the upper end of said air tube extends through the horizontal partition D' within the filling ring and communicates with the upper air chamber E therein. The air tubes H extend below the lower ends of their respective filling tubes and at its lower end each of said air tubes is provided with an enlarged tapered or conical or head piece H'. In the head H' is formed a horizontally extending passage h which opens at its outer end through one side of said head piece and communicates at its inner end with the lower end of the air tube H.

A sleeve K is fitted loosely around each filling tube and the lower end of said sleeve, when the apparatus is not in use, rests on a packing ring h' fitted in an annular groove formed in the head H' of the air tube H. In the upper end of the sleeve K is formed a suitable stuffing box adapted to be filled with

any desired packing material, and thereby form a tight joint between said sleeve and the filling tube about which it is packed.

An annular, laterally projecting flange, L, is formed integral with or rigidly attached to each sleeve K, near its upper end and to said flange, L, are rigidly attached the upper ends of depending supporting rods M, to the lower ends of which rods is attached a bottle guide N.

Around each of the series of filling tubes of the apparatus, between the filling ring and the stuffing box at the upper end of the sleeve K, is arranged a coiled spring O; and an elastic pad P, provided with a central socket *p*, is suitably attached to the under side of the annular laterally projecting flange L.

The operation of my improvements may be briefly stated as follows: When it is desired to fill a bottle, the neck thereof is passed through the central tapering passage in the guide N carried by any one of the filling tubes and the upper end of the bottle forced into the socket, *p*, in the elastic pad P. The bottle to be filled is thus hermetically sealed.

By pushing upwardly on the bottle the sleeve K and parts attached thereto will be moved vertically a short distance, compressing the coiled spring O and uncovering the lower end of the filling tube and the outer end of the laterally extending passage, *h*, in the head H' of the air tube H. As soon as the lower end of the filling tube is uncovered by the vertical movement of its sleeve K a portion of the liquid which has passed from the source of supply to the lower compartment or chamber of the filling ring D will pass into and fill the bottle. The air forced out of the bottle by the entrance of the liquid thereto will pass through the air tube H into the upper compartment of the filling ring, and thence, through the pipe or tube F, to the source of liquid supply above the liquid therein. The stuffing box at the upper end of the sleeve K forms an air tight joint between said sleeve and the filling tube and it is therefore impossible for any air to enter the bottle while the same is being filled. The bottle and filling tube being hermetically sealed the bottle will only be filled to a level with the lower end of the air tube H. When the bottle is filled and removed the parts are returned to the positions shown in Figs. 2 and 3 by the action of the spring O, and further escape of the liquid prevented.

Among the advantages of my improvements as hereinbefore described, may be mentioned the following: By having the filling tube cut off square and the entire area, less the small amount of space occupied by the central air tube, opening into the bottle, the latter can be filled in about one half of the time required to fill the same with apparatus in which the liquid escapes through a lateral outlet in a filling tube.

Another advantage obtained by my inven-

tion is that by employing the "filling ring," I do away with the necessity for having a separate supply and air tube for each filling tube and thereby materially reduce the weight of the apparatus and render the same much simpler of construction.

I am aware that changes in the form and proportion of parts and details of construction of the devices herein shown and described as an embodiment of my invention can be made without departing from the spirit or sacrificing the advantages thereof, and I therefore reserve the right to make such changes and alterations as fairly fall within the scope of the same. For example, instead of having the air pipe F extend for a portion of its length through the liquid supply pipe, as shown in the present case, I may arrange said tube wholly without the liquid supply pipe.

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

1. In an apparatus of the character described, the combination with a source of supply, of a "filling ring" having its interior divided into two independent compartments, connections for conducting liquid from the source of supply to one of the compartments of the "filling ring" and for conducting air from the other compartment of the ring to the source of supply above the liquid therein, and a filling tube communicating with the liquid compartment of the "filling ring" and provided with an air tube which communicates with the other compartment of the ring; substantially as described.

2. In an apparatus of the class described, the combination with a source of supply, of a filling ring arranged concentric with a supply pipe and having its interior divided into two independent compartments one of which is connected by liquid supply pipes with the source of supply, the other compartment of said ring being connected with the source of supply above the liquid therein, and a filling tube communicating with the liquid compartment of the filling ring and having an air tube which communicates with the other compartment of said ring, substantially as described.

3. In an apparatus of the class described, the combination with a source of supply, of a tank, A, connected with the source of supply and provided with a series of radially projecting supply pipes which support and communicate with one compartment of a filling ring which has its interior divided into two independent compartments, connections between the other compartment of the filling ring and the source of supply above the liquid therein, and a filling tube which communicates with the liquid compartment in the filling ring and has an air tube which communicates with the other compartment of said ring, substantially as described.

4. In an apparatus of the character described, the combination with a source of supply, of a filling ring having its interior divided into two compartments by an imperforate partition, means for conducting liquid from the source of supply to the lower compartment in the filling ring, connections between the upper compartment of said ring and the source of supply above the liquid therein, and a filling tube communicating at one end with the lower compartment of the filling ring and having an air tube which communicates with the upper compartment of said ring, substantially as described.

5. In an apparatus of the character described, the combination with a source of supply, of a filling ring having its interior divided into two independent compartments by an imperforate partition, means for conducting liquid from the source of supply to the lower compartment of the filling ring, connections between the upper compartment of the filling ring and the source of supply above the liquid therein, a filling tube carried by the filling ring and communicating at its upper end with the lower liquid compartment thereof, and an air tube arranged centrally within and extending through the filling tube and communicating at its upper end with the upper compartment of the filling ring, substantially as described.

6. In an apparatus of the character described, the combination with a source of supply, of a filling ring having its interior divided into two independent compartments by an imperforate partition, means for conducting liquid from the source of supply to the lower compartment of the filling ring, connections between the upper compartment of said ring and the source of supply above the liquid therein, a filling tube carried by the filling ring and communicating with the lower compartment thereof, an air tube extending centrally through the filling tube and communicating with the upper compartment of the filling ring, and a vertically movable sleeve arranged outside of the filling tube and adapted to cut off communication with the lower end thereof, substantially as described.

7. In an apparatus of the character described, the combination with a source of liquid supply, of a filling ring having its interior divided into two independent compartments, means for conducting liquid from the source of supply to one compartment of the filling ring, connections between the other compartment of said ring and the source of supply above the liquid therein, a filling tube communicating with the liquid compartment of the filling ring, an air tube extending centrally through the filling tube, said air tube having a head provided with a laterally extending passage which communicates with said tube, at its lower end, and its upper end communicating with the air compartment of the filling ring, and a vertically movable sleeve

adapted to cut off communication with the lower end of the filling tube and the passage in the enlarged head attached to the air tube, substantially as described.

8. In an apparatus of the character described, the combination with a source of supply, of a filling ring having its interior divided into two independent compartments, means for conveying liquid from the source of supply to the lower compartment of the filling ring, connections between the upper compartment of said ring and the source of supply above the liquid therein, a filling tube carried by the filling ring and communicating with the lower compartment thereof, an air tube extending through the filling tube and communicating with the upper compartment of said ring, a vertically movable sleeve fitted around the filling tube and adapted to cut off communication with the lower ends of said tube and the air tube therein, and a bottle guide attached to said sleeve, substantially as described.

9. In an apparatus of the character described, the combination with a source of supply, of a filling ring having its interior divided into two independent compartments, means for conducting liquid from the source of supply to the lower compartment of the filling ring, a pipe connecting the upper compartment of said ring with the source of supply above the liquid therein, a filling tube communicating with the lower compartment of the filling ring, an air tube extending through the filling tube and communicating at its upper end with the upper compartment of the filling ring and having at its lower end an enlarged head provided with a lateral passage which opens into the lower end of said tube, a vertically movable sleeve arranged around the filling tube and provided with an annular laterally extending flange, said tube being adapted, when the apparatus is not in use, to rest on an elastic ring carried by the head at the lower end of the air tube and cut off communication with the lower end of said tube and the filling tube, a coiled spring fitted around the filling tube between the sleeve thereon and the filling ring, and an elastic pad attached to the under side of the flange on the vertically movable sleeve and provided with a central socket, substantially as described.

10. In an apparatus of the character described, the combination with a source of supply, of a stationary filling tube connected with the source of supply, a stationary air tube arranged within the filling tube and connected with the source of supply above the liquid therein, said tube having at its lower end, below the filling tube, an enlarged head which is provided with an external annular seat and a laterally extending passage which opens through the side of said head and communicates with the air tube, and a vertically movable sleeve arranged around the filling tube

and adapted to be moved against the seat on the head of the air tube to close the lateral passage in said head and the filling tube, substantially as described.

- 5 11. A bottle filling apparatus, consisting of a filling ring having its interior divided into two independent compartments, a filling tube connecting one of the compartments of the filling ring with a source of supply, and an

air tube connecting the other compartment of said ring with the source of supply, above the liquid therein, substantially as described.

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

SAML. B. SMALLWOOD.

Witnesses:

CHAS. W. HALLETT,
WM. M. SMALLWOOD.