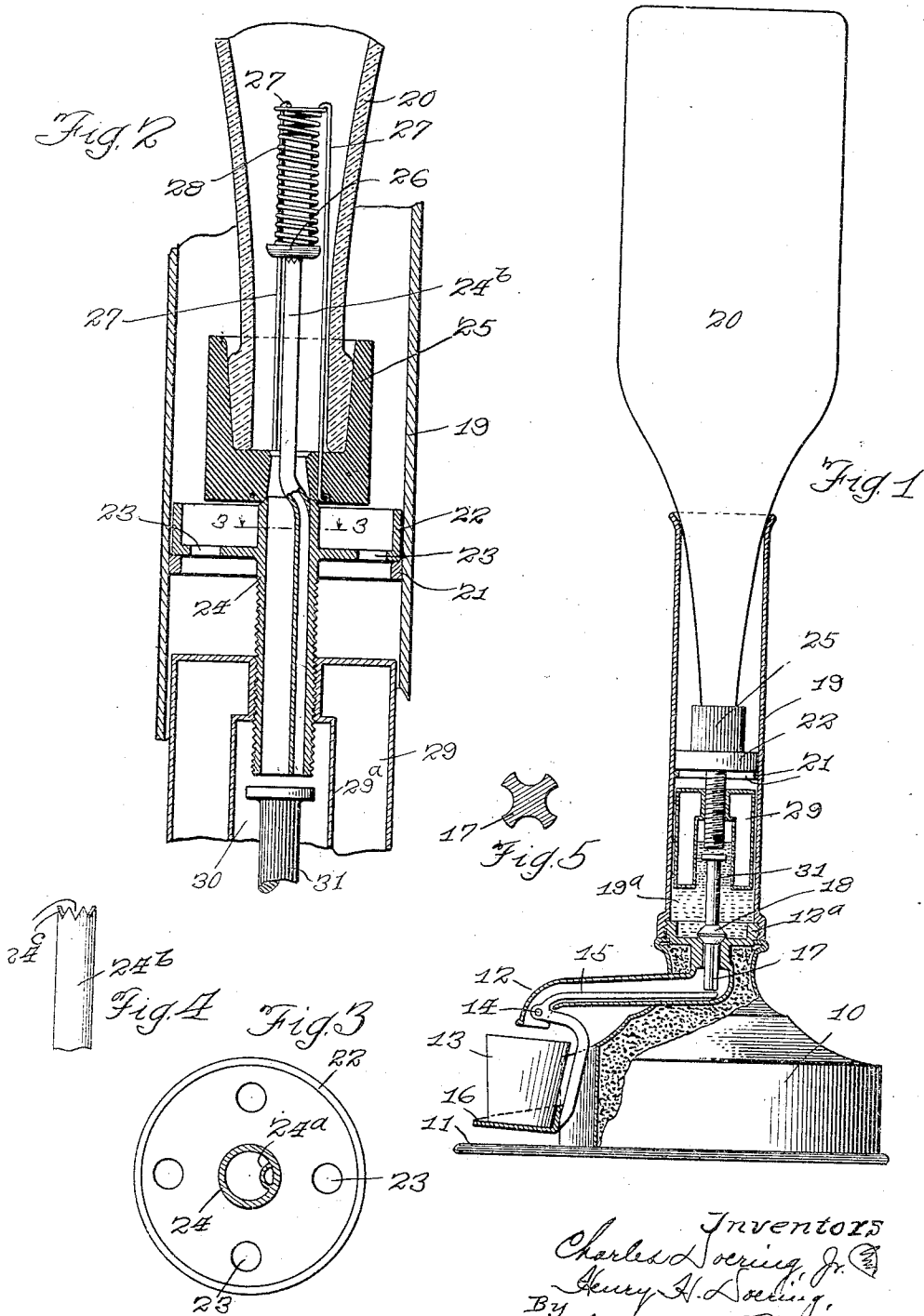


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 LIQUID DISPENSING DEVICE.
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LIQUID-DISPENSING DEVICE.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, CHARLES DOERING, Jr., and HENRY H. DOERING, citizens of the United States, and residents of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Liquid-Dispensing Devices, of which the following is a description, reference being had to the accompanying drawing, which forms a part of our specification.

The object of our invention is to provide a device whereby liquid may be dispensed in measured quantities from a suitable container or bottle by the simple or ordinary manipulation of suitable valve-mechanism without the necessity of any particular operation of the valve-mechanism.

Another object of the invention is the provision of a construction wherein certain elements or means may be "set" or adjusted so as to dispense predetermined or given quantities with each adjustment, so that each operation of the valve-mechanism will dispense a uniform quantity, the advantages of the construction above recited, and others inherent in the construction will be apparent from the detailed description hereinafter set forth.

In the drawing:

Figure 1 is a partial side and partial vertical sectional view of our improved device, with a liquid-container or bottle shown inverted into place.

Fig. 2 is an enlarged longitudinal sectional view of the intermediate or quantity-controlling portion of the construction shown in Fig. 1.

Fig. 3 is a cross sectional plan view of the liquid-conduit portion of the device, taken approximately along the line 3-3 of Fig. 2.

Fig. 4 is a detail view of the upper end of the air-inlet portion or tube of the device.

Fig. 5 is a cross sectional detail view of the valve-stem or guide-portion.

The particular exemplification of the invention, as illustrated in the drawing, comprises a suitable base-portion 10, constructed so as to maintain the device in an upright position, and provided at one side with an extended ledge 11 adapted to receive any slight leakage or drip from the discharge or spout 12, which extends out from the side of the base 10 at a point sufficiently above the lower part of the base, to permit the placing of a suitable cup or receptacle 13

beneath the spout. The spout 12 has pivoted to it, preferably at the point 14, a suitable bell-crank lever 15, the lower or outer end whereof terminates in or is provided with a tray-portion 16 adapted to receive the glass or cup 13; while the other end or portion of lever 15 extends lengthwise within the spout 12 to a point in proximity to the stem 17 of a valve 18.

In the construction illustrated, the spout 12 is provided with the upwardly presented flange portion 12^a, which is provided with a suitable valve-seat for the valve 18. The outer circumference of the portion 12^a is shown threaded to receive the tubular holding-portion or member 19 which is made of suitable length to receive the regulating-mechanism as well as the neck of the inverted container or bottle 20. The upper end of the holding-portion 19 is preferably flared, as shown, and at a proper point, intermediate of its ends, is provided with a flange or shoulder 21 which provides a rest or stop for the annular flanged member or portion 22 of the liquid-conveying conduit of the device, whereby the liquid is conveyed from the bottle 20 to the liquid-receiving chamber 19^a, see Fig. 1.

The disk or annular portion 22 is provided with a suitable number of openings 23 for the passage of air, and is preferably made integral with the tubular member or conduit 24, whereby the liquid is conveyed from the container or bottle 20 into the measuring-chamber 19^a of the device.

The container or bottle 20 may be provided with a suitable stopper 25 if desired, preferably made of rubber and adapted to fit about the neck of the bottle, as shown in Fig. 2. The stopper 25 is shown provided with a suitable spring-controlled valve 26 which normally closes the passage through the stopper, the valve 26 being guided and maintained in proper alinement by suitable guide-rods 27, which also provide a bearing-point for the inner end of the spring 28. The guide-rods 27 are shown properly embedded in the rubber stopper 25, so as to maintain the proper relation between the body portion 25 and the valve 26.

The conduit 24 is preferably provided with a longitudinally extending diaphragm or wall 24^a which, together with one side wall of conduit 24, is preferably extended beyond the upper end of the conduit 24 to constitute an air tube or duct 24^b, as

shown in Fig. 2. The upper end of duct 24^b is preferably serrated, as shown at 24^a, so as to permit the tube or duct 24^b to contact with the valve 26 and, at the same time, permit of the passage of air therethrough and into the bottle or container 20. The upper end of the main portion of conduit 24 is also slightly extended above the portion 22 so as to extend into or form a tight connection with the opening in stopper 25, as shown in Fig. 2.

The lower depending portion of conduit or tubular member 24 is preferably externally threaded to receive the regulating element 29, preferably made to leave space for the passage of air between it and the side walls of the holding-portion 19. The regulating member 29 is preferably of the hollow cylindrical construction shown in Figs. 1 and 2 and provided with the inner wall 29^a so as to provide the inner chamber or space 30 open only at the bottom end thereof; the inner and outer walls of the device 29 being preferably united above the chamber or space, as shown, and provided with a threaded opening for the passage of the tubular member 24. The space or chamber 30 is adapted to receive the upwardly presented stem 31 of the valve 18. The stem 31 preferably terminates in the disk-portion or head, as shown, adapted to close the lower orifice of the conduit 24 when valve 18 is lifted off its seat.

The operation of our device is as follows: A container or bottle provided with the desired liquid is preferably first provided with the valved stopper 25 and then inverted into the holding portion 19 by forcing the bottle downward until the stopper 25 is in firm contact with the upper end of the main portion of conduit 24. Forcing the bottle downwardly, as described, will bring the air-conduit 24^b into contact with the spring-controlled valve 26 thereby forcing the latter upward against the action of its spring, into the neck of the bottle together with the air-conduit 24^b, as shown in Fig. 2. With regulating member 29 made so as to permit passage of air intermediate of member 29 and the wall of the holding portion 19, it is evident that air may flow from the air-space within holding member 19, through the openings 23, between the walls of member 29 and the holding member 19 and into chamber or space 30, thus allowing the air to be conducted from this point by means of air-tube or duct 24^b into the bottle. Admitting air into the bottle will permit liquid to flow through the main portion of conduit 24 into the liquid-receiving chamber 19^a in the lower portion of holding member 19, as shown in Fig. 1. As soon as the liquid in chamber 19^a rises to a point slightly above the lower portion of member 29, it

is evident that the further flow of air into chamber or space 30 will be prevented. As soon as the air in space or chamber 30, beneath the lower end of tube 24, has exhausted through tube 24^b into the bottle to such extent that the liquid flowing into chamber 19^a, and therefore into space 30 covers the lower end of tube 24, further flow of liquid from the container or bottle 20 will be automatically shut off. The manipulator may then place the cup or glass 13 on the tray-portion 16 beneath discharge or spout 12, tilt lever 15 so as to force valve 18 upward from its seat which will cause the upwardly presented stem 31 to close the lower orifice of conduit 24; it being understood, of course, that the normal space between stem 31 and conduit 24 preferably corresponds with the distance or degree of movement permitted bell-crank lever 15. The unseating or lifting of valve 18 will permit the liquid which has entered chamber 19^a to flow out through discharge or spout 12 and into the cup or vessel 13; such discharge being permitted by reason of the fact that the air-space surrounding member 29 is constantly open to the air-space or chamber in holding-portion 19 above the regulating device 29. In order to secure all of the liquid that has entered the chamber 19^a, it is necessary for the manipulator to continue to hold the lever 15 in its tilted position; in fact the weight of the cup or glass 13 and its liquid contents may, of itself, maintain lever 15 in tilted position.

It is evident from the construction shown and described that a constant or uniform quantity of liquid will be obtained with each manipulation of the valve; and if the quantity to be obtained with each manipulation is to be increased or decreased, it may be accomplished by screwing member 29 upward or downward, as the case may be, on the conduit 24.

Our improved device is especially intended to measure out predetermined quantities of the desired liquid to be dispensed by the device with each operation of the valve-mechanism without requiring special operation or manipulation by the operator.

We have shown and described what we believe to be the simplest and best form of our invention, but it is evident that certain details may be altered without, however, departing from the spirit of our invention, and we do not wish to be understood, therefore, as limiting ourselves to the exact construction shown and described.

What we claim is:—

1. A liquid dispensing device, comprising a standard or support provided with a bottle-holding portion, the lower part whereof constitutes a liquid-receiving chamber provided with a discharge port, a valve controlling said port, a conduit for effecting

communication between the bottle-interior and said liquid-receiving chamber, means located within said chamber and surrounding said conduit whereby the quantity of liquid received by said chamber may be varied, and means for operating said valve.

2. A liquid dispensing device, comprising a member provided with an upwardly presented tubular portion adapted to receive the neck of an inverted bottle, while the lower end of said tubular portion is arranged to constitute a liquid-receiving chamber provided with a discharge port, a combined liquid and air conduit arranged in said tubular portion intermediate of the ends thereof and adapted to establish communication between the bottle and said liquid-receiving chamber, means adjustable on said conduit whereby the quantity of liquid received by said chamber may be varied, and means for controlling the flow of liquid from said chamber through the discharge port.

3. A liquid dispensing device, comprising a member adapted to hold a container or bottle in inverted position, the lower part thereof being formed to provide a liquid-receiving chamber having a discharge port, a conduit for effecting communication between the bottle and said chamber whereby air is admitted to the bottle and liquid conveyed therefrom, a regulating member adjustably secured on said conduit whereby the quantity of liquid permitted to enter the chamber may be varied, and a valve adapted to control the discharge port of said chamber and the flow through said conduit.

4. A liquid dispensing device, comprising a member adapted to hold a container or bottle in inverted position, the lower part of said member constituting a liquid-receiving chamber, means intermediate of the bottle or container and said chamber for conducting the air and liquid, means adjustable lengthwise of said first means and provided with a chamber communicating with said first means and open at its lower end, said second means being adapted to vary the quantity of liquid admitted to said liquid-receiving chamber, and means for withdrawing the liquid from the liquid-receiving chamber and adapted to control said air and liquid-conducting means.

5. A liquid dispensing device, comprising a member adapted to hold a container or bottle in inverted position, the lower end of said member constituting a liquid-receiving chamber, a combined air and liquid conduit removably arranged in said holding member and adapted to effect communication between the inverted container or bottle and said liquid-receiving chamber, a member, of substantially the same cross-sectional area as the interior cross-sectional area of said

liquid-receiving chamber, adjustably secured on said conduit and provided with a chamber opening downwardly and in communication with said air and liquid conduit, said member being adapted to vary the quantity of liquid admitted to said liquid-receiving chamber, a discharge port for said liquid-receiving chamber, and means, whereby flow of liquid from the liquid-receiving chamber is controlled and the flow of liquid and air through said air and liquid conduit prevented.

6. A liquid dispensing device, comprising a member provided with an upwardly presented tubular portion adapted to hold a container or bottle in inverted position and provide a liquid-receiving chamber in the lower end thereof, said liquid-receiving chamber being provided with a discharge port, vertically movable means for controlling said port, means whereby air is conveyed into said container or bottle and liquid allowed to flow therefrom into said receiving chamber, means adjustably arranged within said liquid-receiving chamber and provided with a chamber open at the bottom and adapted to receive the end of said air and liquid-conveying means at the top, said means being adapted to vary the quantity of liquid discharged into the receiving chamber, and means whereby said air and liquid-conveying means will be shut off when said port-controlling means are operated.

7. A liquid dispensing device, comprising a member adapted to hold a container or bottle in inverted position and provided with a liquid-receiving chamber in the lower end thereof, said liquid-receiving chamber being provided with a discharge, means for providing a seat for the mouth of the inverted bottle or container and to conduct air and liquid to and from the bottle or container, said means being arranged in communication with the liquid-receiving chamber, a member adjustably arranged in the liquid-receiving chamber adapted to vary the quantity of liquid admissible to said chamber, means adapted to control said discharge and the orifice of said air and liquid-conducting means, and a cup-receiving member adapted to control said last-mentioned means.

8. A liquid dispensing device, comprising a member adapted to hold a container or bottle in inverted position and provide a liquid-receiving chamber, an air and liquid conduit intermediate of the container or bottle and said liquid-receiving chamber, means adjustable lengthwise on said conduit whereby the quantity of liquid admitted to said chamber may be varied, said liquid-receiving chamber being provided with an outlet, means for controlling said outlet and the orifice of said conduit, and a pivoted

member for controlling said last-mentioned means.

9. A liquid dispensing device, comprising
a member adapted to hold a container or
5 bottle in inverted position and provided with
a liquid-receiving chamber in the lower part
thereof, said chamber being provided with
an outlet, an air and liquid-conveying con-
duit arranged intermediate of the bottle and
10 said chamber, a member adjustable length-
wise of said conduit for varying the quantity

of liquid admitted to said chamber, a verti-
cally movable valve-member for simultane-
ously controlling said outlet and lower end
of said air and liquid conduit, and a bell- 15
crank lever adapted to receive a cup and to
operate said valve-member.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."