No. 630,965. Patented Aug. 15, 1899.

C. W. WURSTER.

AUTOMATIC FUNNEL.

(Application filed Apr. 22, 1899.)

(No Model.) 2 Sheets—Sheet 1.

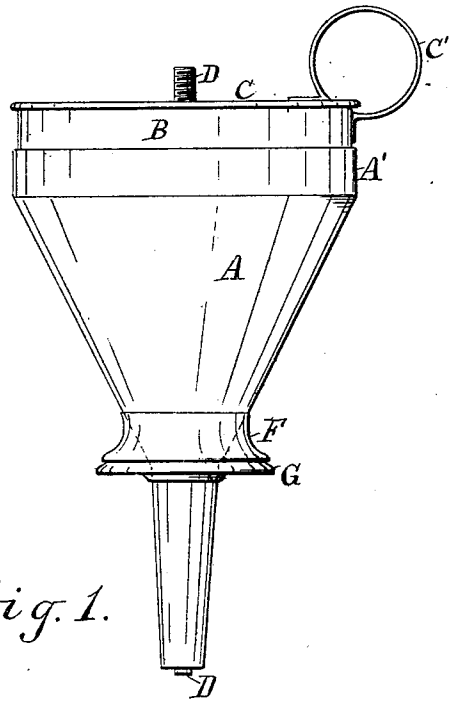


Fig. 1.

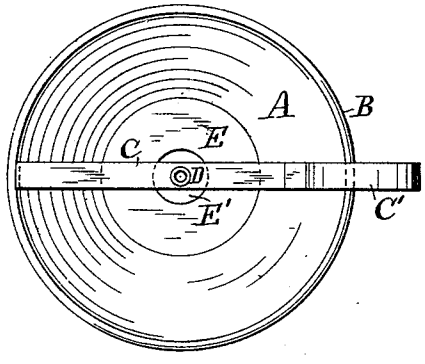


Fig. 2.

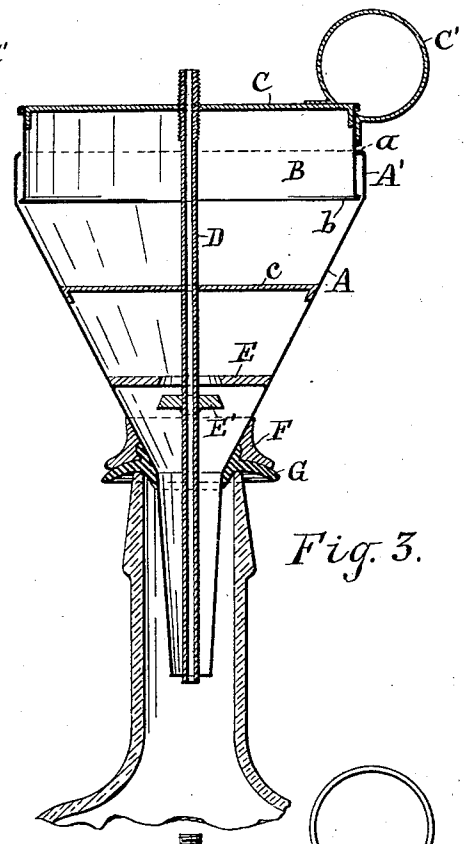


Fig. 3.

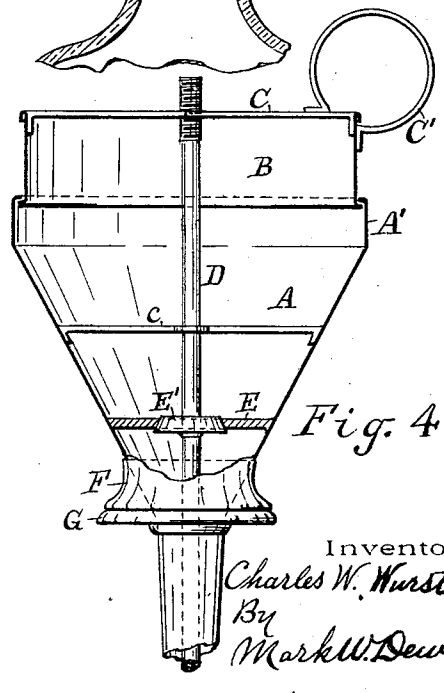


Fig. 4.

Witnesses.

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(No Model.) 2 Sheets—Sheet 2.

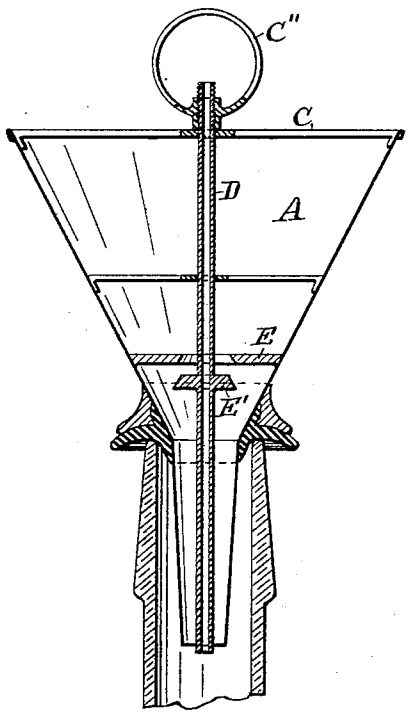


Fig. 5.

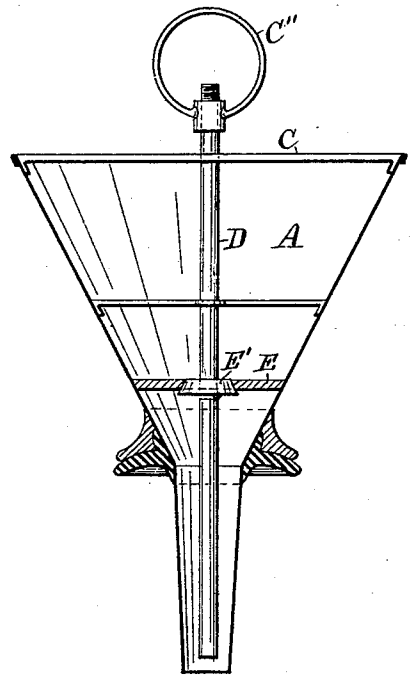


Fig. 6.

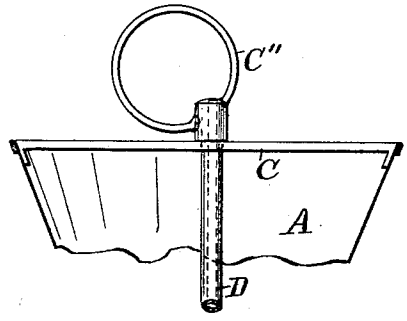


Fig. 7.

Witnesses.
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UNITED STATES PATENT OFFICE.

CHARLES W. WURSTER, OF ITHACA, NEW YORK.

AUTOMATIC FUNNEL.

SPECIFICATION forming part of Letters Patent No. 630,965, dated August 15, 1899.

Application filed April 22, 1899. Serial No. 714,005. (No model.)

To all whom it may concern:

Be it known that I, CHARLES W. WURSTER, of Ithaca, in the county of Tompkins, in the State of New York, have invented new and useful Improvements in Automatic Funnels, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to automatic funnels which are used for filling bottles with liquids and which cease to flow automatically when the bottle or other vessel is filled to a certain height, usually to the lower end or outlet of the funnel.

The object of my invention is to provide a more simple device of this character and one which when removed from the bottle filled will retain the contents of the funnel when raised from the bottle until placed in an empty bottle, when it will automatically and immediately commence to flow again.

My invention differs from others of the same class in that the valve is closed first before the funnel is raised from the bottle, thus preventing a temporary flow of the liquid during the raising of the funnel, which increases the height of the liquid in the bottle.

To this end my invention consists, broadly, in a funnel-body, a vertical longitudinally-movable air-tube therein provided with a valve, a valve-seat within the funnel, supports for the said tube, and a handle on or attached to the upper end of the air-tube; and my invention consists in certain other combinations of parts hereinafter described, and specifically set forth in the claims.

In the drawings hereto annexed and forming a part of this specification, Figure 1 is a side elevation of my invention. Fig. 2 is a top plan view. Fig. 3 is a vertical central sectional view of Fig. 1. Fig. 4 is a side elevation, partly in section, showing the air-tube with the valve raised and in engagement with the valve-seat. Figs. 5 and 6 show sectional views of a modified form of construction wherein the movable tube or ring at the upper end of the funnel is dispensed with, thus making the device more simple and less expensive to manufacture; and Fig. 7 shows a fragmentary view wherein the handle is mounted rigidly upon the upper end of the air-tube.

Referring specifically to Figs. 1 to 4 of the drawings, A is the funnel-body, which is substantially of the ordinary shape or style, except that its mouth or upper end terminates in a short straight tube A′, having its edge *a* turned inward to form a stop for an inner concentric tube B, which is fitted to slide vertically within the tube A′ and has its lower edge *b* turned outward to engage with the edge *a* when the tube B is raised sufficiently.

C is a strip or bridge extending across and between the top edges of the tube B to support the vertical air-tube D, and C′ is the handle, which has its ends preferably secured to the strip C and one side of the ring or tube B.

c is a narrow stationary horizontal strip within the funnel for supporting the air-tube D and which permits said tube to slide through it when raised by means of the handle.

E is a diaphragm containing a circular valve-seat encircling the air-tube and rigidly secured at its outer edge to the inner wall of the funnel-body A, and preferably in the lower portion thereof. The inner edge of the valve-seat is preferably beveled to receive and admit the bevel-edged valve E′, mounted rigidly on the air-tube below the valve-seat. When the bottle is filled to the lower end of the funnel, of course the liquid rises within the funnel to some point above the valve-seat. When this is noticed by the operator, the valve is closed by raising the air-tube D by means of the handle C′. The funnel is not raised from the mouth of the bottle until after the valve is completely closed or until the valve E′ is raised to the valve-seat E. Then as the valve engages the seat the whole funnel is raised from the bottle, the liquid being retained in the funnel until it is placed upon another bottle to be filled, when upon releasing the handle the air-tube D, with the tube B, drops by gravity and the valve opens, allowing the liquid contained in the funnel to flow into the bottle. During the filling of the bottle the air present within it finds its only outlet through the tube D.

In order to prevent the liquid from rising in the bottle higher than the lower end of the funnel, I provide the funnel above the point where it would naturally rest upon the mouth of the bottle with a flanged collar F, which is secured rigidly to it. Below or upon the

lower side of this collar is a washer G, of some suitable flexible material, preferably rubber, which rests upon the top edge or mouth of the bottle, as shown in the drawings. An annular recess in the lower side of the said collar contains an upwardly-projecting flange of the washer and retains it in place. The weight of the complete device, which is largely increased by the heavy metal collar F, serves to effect the sealing of the neck of the bottle, thus preventing admission of air.

For the purpose of adjusting the height of the valve the upper end of the air-tube is threaded where it passes through the bridge C. By turning the tube in the bridge in one direction or the other said tube and valve may be raised or lowered, as desired, to vary the area of the passage or to increase or decrease the flow of liquid through the valve-seat E.

Figs. 5 and 6 show a modified form of construction which is more simple, for the reason that the short tubes A′ and B are dispensed with entirely. The bridge C is secured at its ends directly to the upper edge of the body of the funnel and the upper end of the air-tube D slides through it, the threaded portion being above. The tube D and valve are raised by means of a handle C″, directly attached to the upper end of the tube, and when the valve engages the seat the entire device is raised, as with the other form hereinbefore described. When the valve is opened or lowered, it is supported by means of the lower or threaded part of the handle resting upon the upper side of the bridge C. To adjust the height of the valve, it is only necessary to turn the handle in one direction or the other on the tube, as will be understood.

In some cases, where adjustment is not necessary, the upper end of the tube may be rigidly secured to the bridge in the structure shown in Figs. 1 to 4, inclusive, or the tube may be rigidly secured to the handle in the structure shown in Figs. 5 and 6, as clearly shown in Fig. 7 of the drawings.

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

1. The combination in an automatic funnel, of the funnel-body, a washer on the funnel-body to rest upon the mouth of the bottle, a vertical, longitudinally-movable air-tube within the funnel-body, a valve on the said tube, a diaphragm containing the valve-seat, means to adjustably support the said tube, and a handle connected to the upper end of the tube, as set forth.

2. The combination in an automatic funnel, of the funnel-body terminating at its upper end in a short straight tube, an inner tube adapted to slide within the short tube, means to prevent the withdrawal of the inner tube from the short tube when the former is raised, a handle connected to the said inner tube, an air-tube movable vertically connected to the said inner tube and provided with a valve, a diaphragm within the funnel containing a valve-seat, said diaphragm being normally above the valve, and means to seal the junction between the funnel and the mouth of the vessel to be filled, as and for the purpose set forth.

3. The combination in an automatic funnel, of the funnel-body terminating at its upper end in a short straight tube having its edge turned inward, an inner tube adapted to slide loosely within the short tube and having its lower edge turned outward to make contact with the turned edge of the short tube when the former is raised, a handle connected to the said inner tube, an air-tube movable vertically connected to the said inner tube and provided with a valve, a diaphragm within the funnel containing a valve-seat, said diaphragm being normally above the valve, and means to seal the junction between the funnel and the mouth of the vessel to be filled, as and for the purpose set forth.

4. The combination in an automatic funnel, of the funnel-body terminating at its upper end in a short straight tube, an inner tube adapted to slide within the short tube, means to prevent the withdrawal of the inner tube from the short tube when the former is raised, a strip extending diametrically across the inner tube, a handle connected to the said strip, an air-tube movable longitudinally and vertically, and adjustable in the said strip, a valve mounted rigidly upon the air-tube, a diaphragm within the funnel containing a valve-seat, said diaphragm being normally above the valve, and means to seal the junction between the funnel and the mouth of the vessel to be filled, as and for the purpose set forth.

5. The combination in an automatic funnel, of the funnel-body, the air-tube movable vertically within the same and provided with a valve, the valve-seat above the valve and secured to the funnel-body, supports for the air-tube, means to close the valve before the funnel-body is raised, a flanged collar encircling the funnel-body and containing a circular recess near its lower end, and a flexible washer below the collar to bear upon the mouth of the bottle, and having a flange within said recess, substantially as described and shown.

In testimony whereof I have hereunto signed my name.

CHARLES W. WURSTER. [L. S.]

Witnesses:

R. A. TREFETHEN,

W. A. BELCHER.