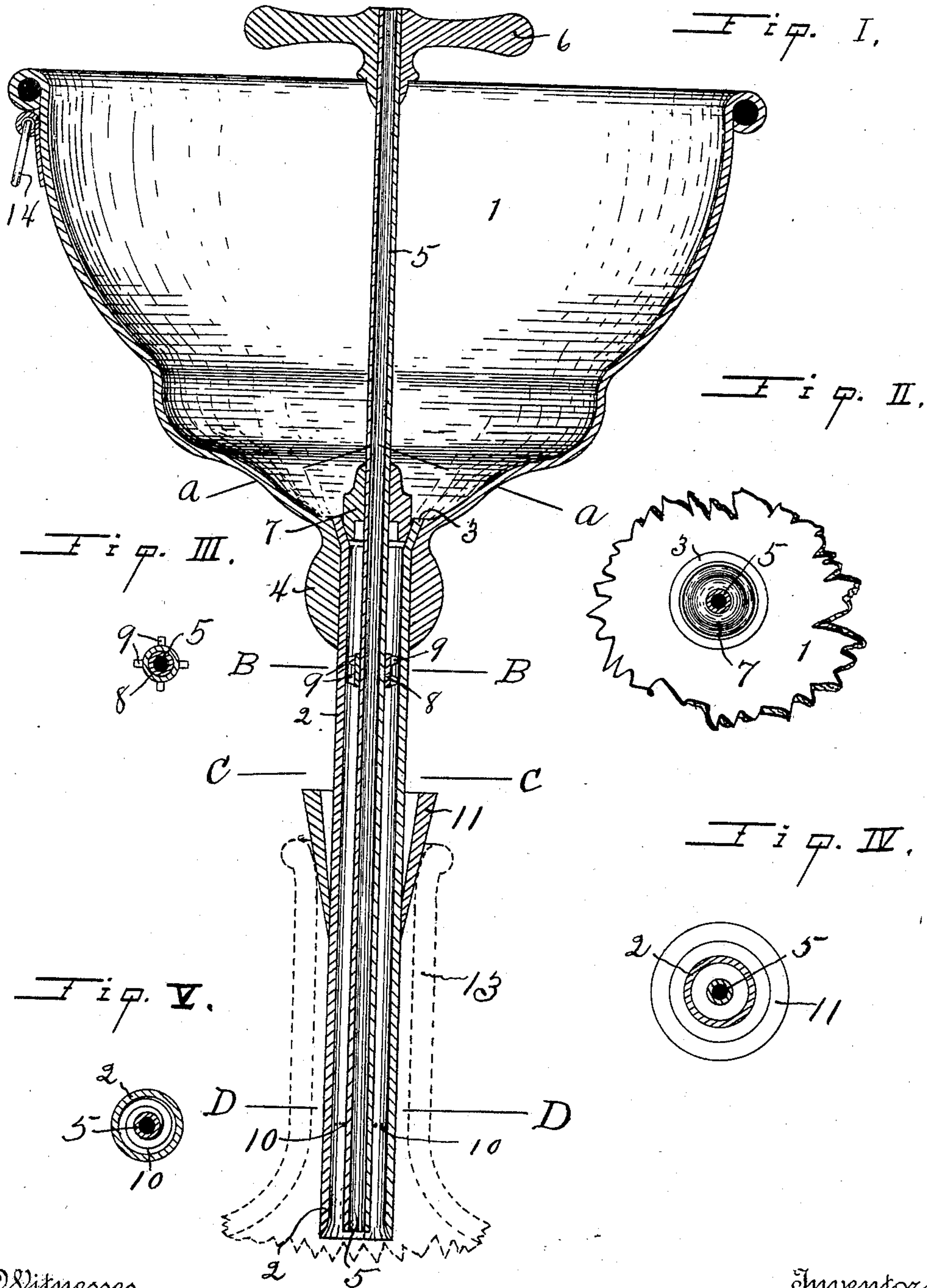


(No Model.)

E. D. MIDDLEKAUFF.
AUTOMATIC COMBINATION FUNNEL.

No. 596,606.

Patented Jan. 4, 1898.



Witnesses
Molby Haynes
L. B. Hodge

Inventor
Ellsworth D. Middlekauff.
By Joshua B. Webster
Attorney

UNITED STATES PATENT OFFICE.

ELLSWORTH D. MIDDLEKAUFF, OF SAN FRANCISCO, CALIFORNIA.

AUTOMATIC COMBINATION-FUNNEL.

SPECIFICATION forming part of Letters Patent No. 596,606, dated January 4, 1898.

Application filed April 5, 1897. Serial No. 630,894. (No model.)

To all whom it may concern:

Be it known that I, ELLSWORTH D. MIDDLEKAUFF, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Automatic Combination-Funnels; and I do 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, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to certain new and useful improvements in automatic combination-funnels such as are used in transmitting liquids into bottles and like vessels; and my object is to furnish a funnel with the use of which the danger of overflowing the vessel is obviated and in which the remaining liquid may be retained in such funnel and transferred to other vessels.

It consists in the peculiar construction, novel combination and adaptation of parts hereinafter set forth, and specifically pointed out in the claims hereunto annexed, reference being had to the accompanying drawings, in which—

Figure 1 is a vertical sectional view through the center of my improved funnel. Fig. 2 is a horizontal sectional view through line A A, Fig. 1, showing valve. Fig. 3 is a horizontal sectional view through line B B, Fig. 1, showing guide on plunger. Fig. 4 is a horizontal sectional view through line C C, Fig. 1, showing the rubber thimble attached to the tube. Fig. 5 is a sectional view through line D D, Fig. 1, showing spiral spring attached near the lower end of the plunger.

Similar figures of reference indicate corresponding parts throughout the several views.

1 represents the bowl of my improved funnel, which bowl 1 is of the general form of an inverted cone, having an opening in its apex for the reception of a tube 2, such as is commonly used for funnels, such tube 2 being rigidly attached to such bowl and flared at the top 3 of the same, for the purpose hereinafter set forth. At the junction of the tube 2 with the bowl 1, as at 4, such bowl is com-

posed of heavy material for the purpose of strengthening the same. A hollow plunger 5, which is adapted to extend the entire length of the funnel, is inserted in the tube 2. To the top of such plunger 5 a handle 6, of ordinary construction, is rigidly attached. At a suitable point on the plunger 5 a valve 7, adapted to closely engage with the top 3 of the tube 2, is rigidly attached thereon. A guide 8, having lugs 9 on its sides, is rigidly attached to and surrounds the plunger 5 at a short distance below the valve 7. Near the lower end of the plunger 5 one end of a spiral spring 10 is rigidly attached, which spring 10 is adapted to engage with the sides of the tube 2, for the purposes hereinafter shown. A thimble 11, of rubber or other flexible material, its upper end having a greater diameter than its lower end, is inserted on the tube 2 and is adaptable to adjustment on such tube 2 and engagement with the neck of a bottle 13.

14 represents a loop by which my funnel may be suspended.

The mode of operating my improved funnel is as follows: The thimble 11 having been adjusted on the tube 2 such tube 2 is then inserted in the neck of a bottle or other vessel, which closely engages with the thimble 11, and thereby rendering the aperture without the tube 2 air-tight. The plunger 5 is now raised sufficiently to unseat the valve 7, when the liquid poured into the bowl 1 of the funnel will be conducted through the tube 2 into the vessel, the bottom plunger 5 serving for the escape of air, so that the liquid will attain a height in the vessel slightly above the lower end of the tube 2, and the surplus liquid will then remain in bowl 1. The plunger 5 is then moved downwardly so as to seat the valve 7 and thereby enable the same liquid to remain in the bowl of the funnel when said funnel is lifted from the vessel. The guide 8 9 is adapted to engage with the sides of the tube 2 for the purpose of facilitating the introduction of the valve into closed position, and the spring 10 is adapted to impinge upon the sides of the tube 2 and thus maintain the plunger 5 in any desired elevated position when it is desired to maintain the valve 7 open without removing the plunger 5 wholly from the funnel. While in such position in the process of filling the air may escape through

the opening in the plunger 5. After the valve 7 has been closed the funnel is then removed from the filled vessel and the tube 2 introduced into another vessel, the valve 7 opened 5 by means of the handle 6, and the *modus operandi* is repeated.

I am aware that funnels have been made which check the flow of liquid when the vessel is filled, and that feature I do not claim, 10 broadly; but

What I do claim as new, and desire to secure by Letters Patent, is—

1. In a funnel of the class described the combination with a bowl having an opening 15 in the bottom of the same of a spout or tube 2 rigidly attached in such opening, such tube 2 having its top end flared, a flexible thimble 11 adapted to engage the tube 2 at suitable points, the plunger 5 having the air-passage 20 therein, the spiral spring 10 attached to the plunger 5 near the lower end of the same, and adapted to engage with the sides of the tube 2, the guide 8 rigidly attached to near the center

of the plunger 5, the valve 7 rigidly attached to and adapted to comprehend the plunger 5 25 and engage with the top end of the tube 2, and the handle 6 rigidly attached to the top end of the plunger 5, all arranged and operating substantially as shown and for the purposes specified. 30

2. In a funnel a plunger provided with an air-passage longitudinally in the same, a spiral spring rigidly attached at one end to such plunger, a valve attached at a suitable point on such plunger and adapted to engage 35 with a seat in the tube of the funnel in combination with a suitable funnel body or bowl and tube, all arranged and operating substantially as shown and for the purposes specified. 40

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

ELLSWORTH D. MIDDLEKAUFF.

Witnesses:

R. A. JACKSON,
JEANNETTE CLARK.