

(No Model.)

H. I. KEINER.
AUTOMATIC FUNNEL.

No. 530,228.

Patented Dec. 4, 1894.

Fig. 1.

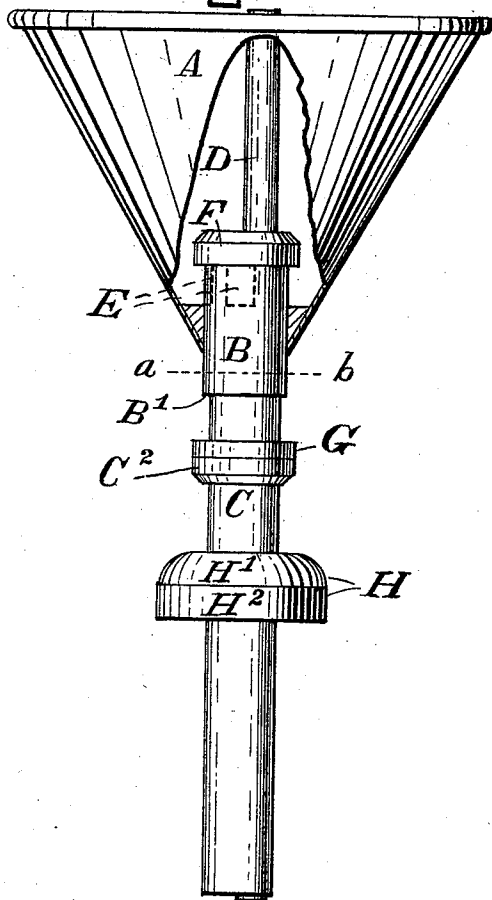


Fig. 2.

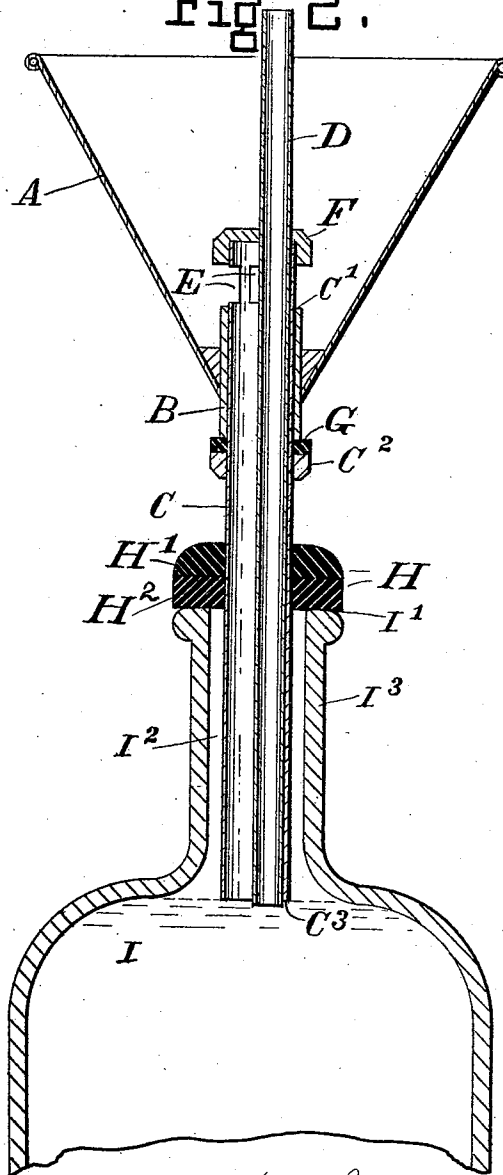
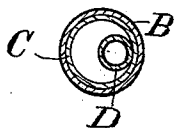


Fig. 3.



WITNESSES:

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AUTOMATIC FUNNEL.

SPECIFICATION forming part of Letters Patent No. 530,228, dated December 4, 1894.

Application filed July 2, 1894. Serial No. 516,371. (No model.)

To all whom it may concern:

Be it known that I, HARVEY I. KEINER, a citizen of the United States, and a resident of Wilkes-Barré, county of Luzerne, and State of Pennsylvania, have invented certain new and useful Improvements in Automatic Funnels, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof, in which similar letters of reference indicate corresponding parts in all the figures.

This invention relates to automatic funnels of that class in which a valve mechanism opens or closes and thereby regulates the flow of the liquid from the funnel according as it is applied or removed from the vessel upon which it is to be used.

My invention consists in providing a funnel with a depending sleeve or tube in which a tubular valve is loosely fitted and slides, such valve having one or more openings near its upper end through which the liquid flows from the funnel when the latter is in position upon the bottle or vessel to be filled, and so arranged that whenever the bottle is sufficiently filled, the further flow of the liquid will be arrested, and when the funnel is raised from the bottle the valve will fall and prevent the egress of the liquid remaining in the funnel.

The invention further consists in providing the tube with a collar and gasket by which the movement of the tube is limited to the requisite degree and the passage of any liquid which might permeate between the tube and the sleeve prevented; and also in providing the tube with an adjustable stopper by which the depth of the tube in the bottle may be regulated and the space around the tube within the neck of the bottle made air-tight.

The object of my invention is to produce a funnel by which a bottle or similar vessel may be rapidly filled with liquid without danger of overflow of the vessel and consequent loss of the liquid decanted.

The nature and purpose of my invention will be more fully understood from the accompanying drawings, in which—

Figure 1 represents a front elevation of a funnel embodying my invention, the upper part of which is broken away in order that the interior construction thereof may be more

clearly understood. Fig. 2 is a central vertical section of the funnel mounted upon a bottle. Fig. 3 is a cross section of the tube and sleeve on the line *a-b*, Fig. 1.

In the practice of my invention, I construct a funnel A, having mounted upon its lower end the sleeve B, in which a valve tube C is loosely fitted. Within the tube C is secured an air-tube D, arranged at one side or in an eccentric position thereto as best shown in Fig. 3. The upper end C' of the tube C is provided with openings or ports E, and is otherwise closed by the valve F, which is attached thereto, and through which valve the air tube D extends.

The tube C has formed thereon a collar C², at such distance beneath the lower end B' of the sleeve B as to permit the said sleeve to fall sufficiently to expose the ports or openings E while preventing too great downward movement thereof. A gasket G immediately above the collar C² and secured thereto forms an air-tight joint between the collar and the sleeve. The sliding movement of the tube C within the sleeve is too rapid to allow any liquid to enter the joint between them. The collar also forms an elastic cushion for the sleeve to rest upon.

Below the collar C² a rubber washer, or stopper H is frictionally secured to the tube, the said stopper serving as a seat for the funnel when placed upon a bottle I, and also to seal the mouth of the said bottle during the operation of the funnel. The stopper H is formed in two parts, H' and H², the upper section or body portion H' being of medium hard rubber while the lower section H² is of soft rubber to more effectually conform to any irregularities of surface of the mouth I' of the bottle and render the space I² within the neck I³ of the bottle air-tight, as will hereinafter more fully appear.

The tube C is of sufficient length to permit the requisite movement to open and close the valve and to extend so far into the bottle as to limit the filling of the latter to the height required; and the air tube D extends from the bottom of the tube upwardly therethrough to, or appreciably above the top of the funnel. The said tube C fitting loosely in the sleeve B will, whenever the funnel body is held in the hand, or when removed from the bottle

neck, fall and cause the device to assume the position shown in Fig. 1, the ports E being closed and the valve F resting upon its seat. When the funnel is inserted in the bottle its weight causes the sleeve to slide down upon the tube until it abuts against and rests upon the gasket G, thereby instantly opening the ports to permit the passage of the liquid there-through.

- 10 The stopper H has a flat under surface in order that it may cover the mouth of a bottle more perfectly and be applied to those of different diameters as well; and is formed of rubber of different degrees of hardness, for the reason that the soft rubber will facilitate an air-tight junction with the bottle, and the harder rubber furnish the necessary rigidity.

I prefer to arrange the air tube eccentrically within the valve tube to the end that it may be more firmly secured within the latter and allow of a more unobstructed passage of the liquid through the tube.

The operation of the funnel is as follows: The device being in the normal position shown in Fig. 1, is inserted in the bottle to be filled, the stopper H resting upon the neck and thereby making an air tight jointure with the mouth I' of the bottle, by reason of its flexibility and elasticity. The funnel immediately assumes the position shown in Fig. 2, the body A sliding downwardly, thereby raising the valve and opening the ports to permit the free passage of the liquid therethrough and down into the bottle. As the liquid enters the bottle the air escapes therefrom by way of the air tube D, and the operation of filling continues until the liquid reaches the level of the bottom C³ of the tube, thus sealing the mouth of the air tube, whereupon the air in the air space I² within the neck I³ of the bottle being confined therein by the stopper H, cannot escape and forms an air-cushion, which stops the further filling of the bottle until the funnel is raised, when the valve instantly falls and cuts off the further flow of the liquid. The liquid remaining in the funnel, if any, can then be decanted into another vessel, or returned to that from which it was drawn.

50 By frictionally and movably attaching the stopper H to the tube C, the same may be adjusted vertically upon the said tube to regulate the depth of the latter within the bottle, according to the height to which it is desired to fill the bottle.

This device has been referred to as adapted to use with bottles, but it will be perspicuous that jars, cans, lamps, or any other vessels adapted to hold liquids of any kind may be filled thereby as well.

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

1. A funnel consisting of a bowl, a tubular valve sliding therein and adapted to close the bottom of the bowl, an air tube secured within the tubular valve, and a flat elastic stopper frictionally and adjustably secured upon the outside of the said valve, substantially as shown and described.

2. A funnel consisting of a bowl, a tubular valve sliding therein and adapted to close the bottom of the bowl, an air tube within the valve, a flat elastic stopper upon the outside of the valve adapted to rest upon the neck of a bottle, and adjustable thereon, and a collar and gasket above the stopper to limit the movement of the valve, substantially as shown and described.

3. In combination with a funnel, a movable tube sliding vertically upon the body thereof, and having an elastic stopper with a flat under surface frictionally and adjustably secured thereon, and adapted to fit the mouth of a bottle, substantially as described.

4. In combination with a funnel, a tubular valve, having a collar and gasket thereon adapted to limit its movement, and a stopper beneath the same adapted to make an air-tight connection between the funnel and a bottle, substantially as described.

5. A funnel consisting of a body having a sleeve, a tubular valve loosely fitted to the sleeve and provided with openings for the passage of the liquid, a collar and gasket upon the valve tube adapted to limit its movement within the sleeve, an air tube within the valve tube and extending therethrough, and an elastic stopper adjustably and frictionally fitted upon the tube, substantially as described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 29th day of June, 1894.

HARVEY I. KEINER.

Witnesses:

MILTON S. FREAS,
WILLIAM KEINER.