C. LESTER.

COLLAPSIBLE FUNNEL.

APPLICATION FILED JULY 28, 1916.

1,242,453.

Patented Oct. 9, 1917.

FIG. 2.

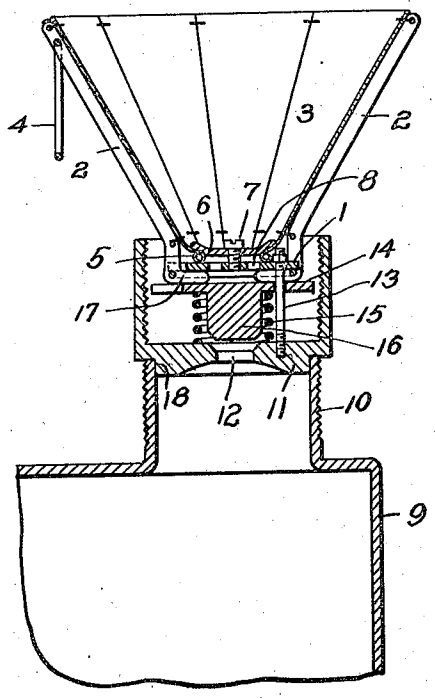


FIG. 1.

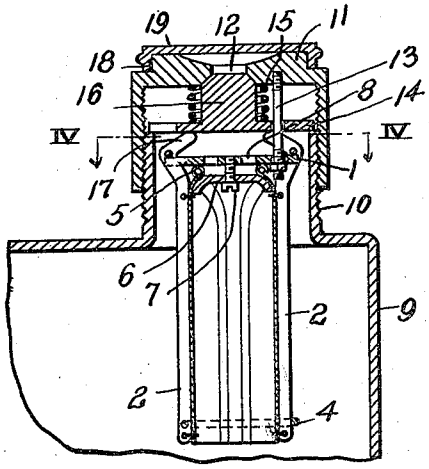


FIG. 3.

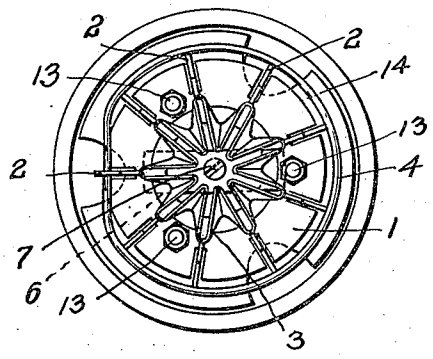
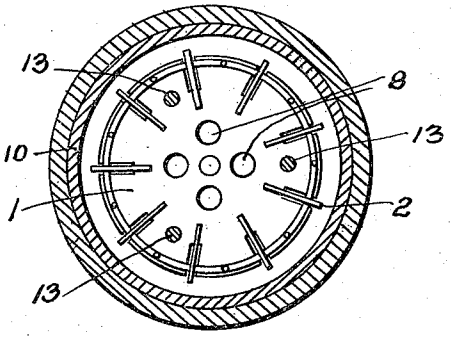


FIG. 4.



WITNESSES

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COLLAPSIBLE FUNNEL.

1,242,453. Specification of Letters Patent. Patented Oct. 9, 1917.

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To all whom it may concern:

Be it known that I, CHARLES LESTER, residing at Ambridge, in the county of Beaver and State of Pennsylvania, a citizen of the United States, have invented or discovered certain new and useful Improvements in Collapsible Funnels, of which improvements the following is a specification.

My invention consists in a collapsible funnel. It finds particular value when assembled in the combination with a cap or closure for an opening—an opening such, for instance, as the filling opening of a gasolene tank or of the radiator of an automobile. The object in view in such a combination is, of course, to have the funnel normally out of the way and protected from dirt, but ready at hand when it is needed.

In the accompanying drawings Figure 1 is a view in vertical section through the filling opening of such a liquid container as an automobile radiator, and through the structure of my invention in position of closure upon that opening. This figure shows the funnel collapsed. Fig. 2 is a similar view of the same parts; but with the funnel expanded and the structure of my invention inverted and serving as a funnel for the same filling opening. Fig. 3 is a plan view of the funnel, removed from the orifice and still collapsed, viewed from below (Fig. 1). Fig. 4 is a view in cross-section, on the line IV—IV, Fig. 1.

A perforate plate 1 carries a series of radially swinging ribs 2 pivoted about its periphery; and a sheet 3 of flexible material, secured to the ribs 2, extends from the perforate plate 1 outward along the ribs 2. By virtue of the pivoting of the ribs and the flexibility of the sheet, the funnel may alternately be collapsed, as shown in Fig. 1, or distended, as shown in Fig. 2. The sheet 3 will conveniently be cut and formed to the conical shape best indicated in Fig. 2. A restraining hoop 4 may be provided, to hold the funnel collapsed. The sheet 3 of flexible material may be a sheet of varnished cloth, or it may be a sheet of some flexible material unaffected by gasolene or boiling water. In any case, it will be of a material suited to the intended service. It will, ordinarily, be brought at its lower edge into substantially fluid-tight contact with the base-plate 1. As shown in the drawings, the edge of the sheet 3 is coiled upon a ring 5, and clamped to plate 1 by the spanner plate 6 and set-screw 7. The perforations in plate 1 are arranged as may be desired; they open of course through the portion of the plate surrounded by the sheet 3. Comparing Figs. 1 and 4, the perforations are indicated at 8.

A second plate 11 is spaced at a suitable interval from plate 1 and on the side of plate 1 opposite the funnel 3; such spacing may conveniently be accomplished by bolts 13 (of which there are preferably three or more), which, passing through the two plates 1 and 11, hold them at a fixed maximum distance apart. This second plate 11 is provided with a central orifice 12.

The ribs 2 already described as carrying the web 3 and pivoted to the periphery of plate 1 extend on both sides of plate 1: they extend on one side, as already explained, to carry the web 3; on the other side they extend obliquely (with respect to the axis of the funnel) into the space between plates 1 and 11. A third plate 14 floats between plates 1 and 11; this floating plate on one side bears upon the extensions 17 of ribs 2; on the other side it is engaged by a coiled spring 15, compressed between it and plate 11. On the side toward plate 11 the plate 14 is provided with a plug 16 for orifice 12. The construction (as will be apparent on comparing Figs. 1 and 2 of the drawings) is such that the collapsing of the funnel will move plate 14 upward (Fig. 1) against the tension of spring 15 and cause plug 16 to close orifice 12; the releasing of the funnel will allow spring 15 to expand, driving plate 14 downward (Fig. 1) uncovering orifice 12 and expanding the funnel. The floating plate 14 will be suitably shaped and arranged, as by being cut away (Fig. 3), to allow the passage of liquid.

The drawings show the funnel of my invention applied to the filling opening in the walls of a water tank of an automobile. 10 is the flange of the filling opening, and the plate 11, provided with a sleeve-like flange, becomes a cap for this opening.

Fig. 1 shows the parts in position of closure; the funnel is collapsed, orifice 12 is closed, and the cap 11 is in place, covering the filling opening of the tank 9. It will be observed that the collapsed funnel then hangs downward and is contained wholly

within the tank. When the tank is to be filled, cap 11 is screwed off. Hoop 4 is then slipped in one direction or the other, to free the ribs of restraint. Thereupon spring 15 expanding shifts floating plate 14 from the position shown in Fig. 1 to that shown in Fig. 2. In consequence of this shifting, orifice 12 is uncovered and the funnel is expanded. The funnel thus prepared may be set on the filling opening of the tank (or, if desired, on the filling opening of another tank) in the position shown in Fig. 2 (the inverted position, relatively to that of Fig. 1), and in that position, manifestly, it is ready for service. The shoulder 18 on the outer face of cap 11 is shaped and proportioned to fit neatly in the bore of the flange 10 of the filling opening.

If desired a dust-cap 19, removable by hand, may be secured upon the outer side of cap 11, protecting the orifice 12 from accumulation of dust. Such a dust-cap is shown in Fig. 1, in place, as it will be when the cap is closing the filling-opening; in Fig. 2 it will be observed (the funnel being there in operative position) the dust-cap has been removed.

I claim as my invention:

1. In a funnel structure the combination of a perforate plate, a collapsible funnel secured to said plate, a perforation-covering plug movable to and fro with respect to said plate, and means coördinating the expanding and collapsing of the funnel with the movement of the plug.

2. In a funnel structure the combination of two plates spaced at an interval apart, a plurality of levers pivoted peripherally to the rim of one of said plates and extending on one side obliquely between said plates and extending on the other side as funnel ribs, and a third plate floating in the space between the two plates first named and bearing yieldingly upon the ends of said levers.

3. In a funnel structure the combination of two plates spaced at an interval apart, and a third plate floating between them, one of the two plates first named being provided with a plurality of levers pivoted to its periphery, and a spring, said floating plate being engaged between the inturned ends of said levers and said spring.

4. In a funnel structure the combination of a perforate plate, a second plate spaced at an interval from the first, said second plate being provided with a plurality of levers pivoted to its periphery, said levers extending on one side to constitute funnel ribs and on the other side being turned in between said plates, and a third plate floating between the two plates previously named and movable to cover and uncover the perforation in the perforate plate, said floating plate being held yieldingly against the inturned ends of said levers.

In testimony whereof I have hereunto set my hand.

CHARLES LESTER.

Witnesses:
CHARLES RANDER,
T. J. BALDWIN.

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