

No. 730,333.

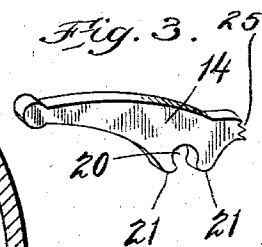
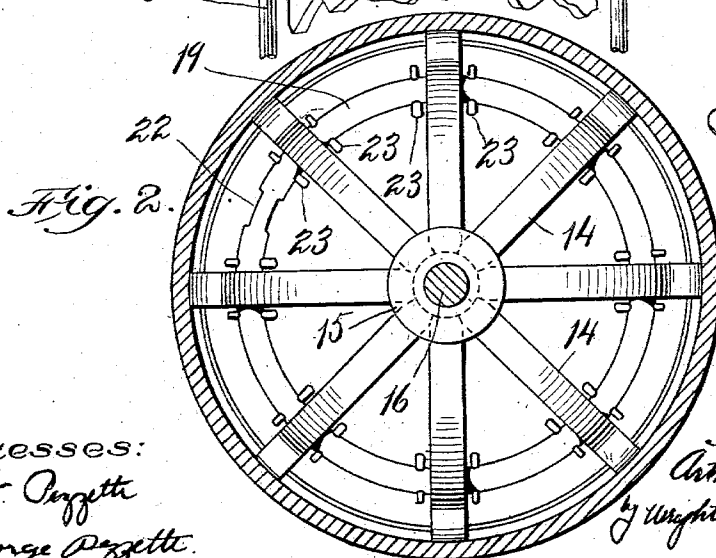
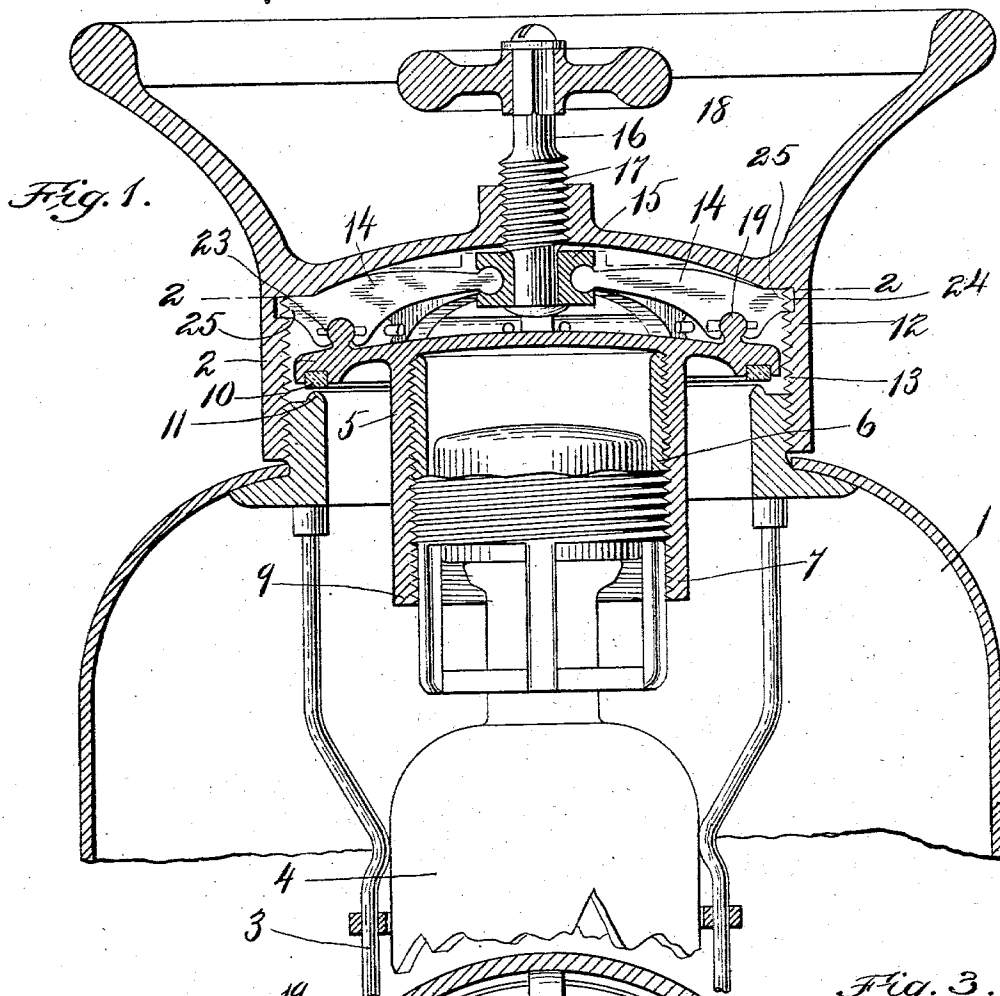
PATENTED JUNE 9, 1903.

A. C. BADGER.
CHEMICAL FIRE EXTINGUISHER.

APPLICATION FILED NOV. 29, 1901.

NO MODEL.

2 SHEETS—SHEET 1.



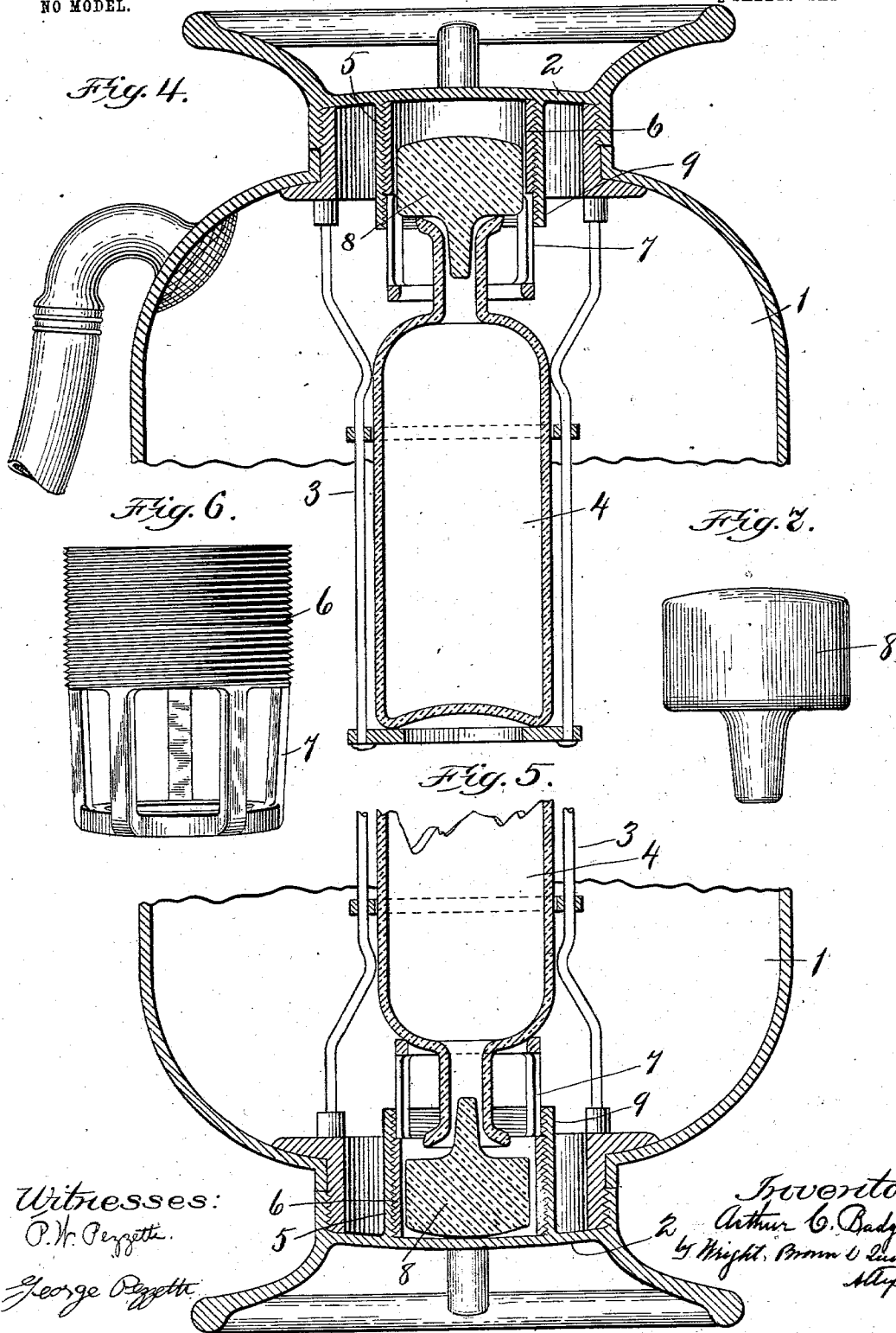
Witnesses:
P. W. Puzette
George Puzette.

Inventor:
Arthur C. Badger
by Wright, Brown & Smith
Attys.

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NO MODEL.

2 SHEETS—SHEET 2.



Witnesses:
P. H. Pezzetta.
George Pezzetta.

Inventor:
Arthur C. Badger
by Wright, Brown & Lundy
Attys

UNITED STATES PATENT OFFICE.

ARTHUR C. BADGER, OF BOSTON, MASSACHUSETTS.

CHEMICAL FIRE-EXTINGUISHER.

SPECIFICATION forming part of Letters Patent No. 730,333, dated June 9, 1903.

Application filed November 29, 1901. Serial No. 84,030. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR C. BADGER, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Chemical Fire-Extinguishers, of which the following is a specification.

This invention relates to chemical fire-extinguishers; and it consists in certain novel features of construction and arrangement therein, which I shall now proceed to describe and claim.

Of the accompanying drawings, Figure 1 represents a vertical sectional view of the upper end of a fire-extinguisher constructed in accordance with my invention. Fig. 2 represents a section on the line 2 2 of Fig. 1. Fig. 3 represents a detail perspective view of one of the cover-actuating levers. Fig. 4 represents a vertical sectional view showing a form of my invention in which certain parts shown in the foregoing figures are omitted. Fig. 5 represents a similar view of the extinguisher inverted. Fig. 6 represents a detail perspective view of the annulus and guide for the stopper. Fig. 7 represents a side elevation of the stopper.

The same reference characters indicate the same parts in all the figures.

One feature of my invention relates to an improved device for controlling the flow of liquid from the inner receptacle when the apparatus has been inverted and the gravity-stopper which I employ has fallen to an open position.

1 represents the outer receptacle or canister in which the alkaline liquid is commonly placed, and 2 represents the cover therefor.

3 is a bottle cage or holder attached to the canister 1 and supporting the bottle or inner receptacle 4, containing the acid.

The cover 2 is formed with an internally-threaded annular downwardly-projecting flange 5, into which is screwed a complementally-threaded sleeve 6, the lower part 7 of which is of skeleton form and constitutes a guide or cage for a gravity-stopper 8, which closes the mouth of the bottle 4 when the apparatus is in upright position. This stopper falls into a retracted position when the appa-

ratus is inverted, so as to liberate the acid in the bottle and permit its outflow and union with the alkaline liquid in the canister 1. The free lower portion or edge 9 of flange 5 is an entire annulus arranged to overlap the stopper 8 and the mouth of bottle 4 when the apparatus is inverted, as shown in Fig. 5, said annulus 9 forming the rim of a cup of which the stopper constitutes the bottom. In its inverted position the breast of the bottle rests against the rim of the guide 7, said bottle being permitted to slide a short distance in its cage in reaching this position of rest, and the stopper 8 rests against the cover 2. When the parts are thus positioned, only enough space is left between the rim of the bottle-mouth, the stopper 8, and the annulus 9 to permit a gradual outflow of the acid from the bottle 4. The relative conformation and location of the parts is such that there is presented a tortuous contracted passage or outlet for the acid, which prevents its too rapid outflow, its outflow being under control and occurring uniformly so long as the supply of acid lasts. The retardation of flow is doubtless due to friction of the liquid against the outlet-surfaces and to the restraint imposed upon the passage of the generated gas from its point of generation at the meeting-place of the two liquids into the bottle 4 to relieve the vacuum above the acid and permit the outflow of the latter. It will be noted that by turning the sleeve 6 it may be screwed into or out of its socket. By so doing the bottle 4 in inverted position will be raised or lowered and the relation of its mouth to the edge of annulus 9 correspondingly varied; so that the amount of overlap of said annulus with respect to the bottle-mouth is adjusted. I thus provide a means for accurately regulating the flow of the acid, and consequently the rapidity of union of the liquids, such regulation arising through the increased or decreased length of the friction-surfaces surrounding the outlet and the increased or decreased difficulty of access of the gas-bubbles to the mouth of the bottle. Screwing the sleeve 6 into the flange 5 decreases the flow of acid, and the opposite adjustment increases it. These adjustments, it will be noted, are effected without chang-

ing the position of the stopper and by means of a very simple and uncostly construction. Their effect in regulating the flow of acid is always manifested in a predetermined degree and automatically when the apparatus is inverted. This advantage I believe myself to be the first to attain.

I do not confine myself to any particular shape of the adjustable annulus or the stopper so long as they operate in substantially the manner described, nor to any particular mode of mounting or adjusting the annulus.

In the form of my invention shown in Figs. 4 and 5 the sleeve 6 is mounted upon a cover 2, which screws upon the neck of the canister 1. In the form shown in Figs. 1 and 2 the sleeve 6 is mounted upon a cover or lid 2 of a different form, which I shall now proceed to describe, the said cover and the means for mounting and actuating it constituting a novel feature of my invention. A difficulty experienced with screwed covers on receptacles of the character of the canister 1, and particularly on the canisters of fire-extinguishers, is that when screwed up tight the covers will often bind so tight as to be removed with the greatest difficulty, the difficulty of removal being greatly increased when the joint between cover and vessel becomes corroded, as it frequently does. The novel construction shown in Figs. 1, 2, and 3 wholly obviates the difficulty of removal of a screwed cover, and yet provides a thoroughly-effective seal or closure for the containing vessel. As shown, the cover 2 is provided with a soft-lead or other packing ring 10, co-acting with a more or less sharpened sealing edge 11 around the mouth of the canister 1. 12 is an outer cap formed with an internal screw-thread 13, engaging a complementary external thread on the neck of the canister 1, whereby said cap is removably attached to the canister. 14 14 are a series of radial cover-actuating levers fulcrumed at their outer ends on the cap 12 and pivoted to the cover 2, their inner ends pivotally engaging a groove formed in a block 15, which turns upon the end of a spindle 16. The latter is formed with a screw-threaded portion 17, mounted to screw in the cap 12, and is provided on its upper end with a hand-wheel 18 for rotating said spindle. It will be seen that when the spindle 16 is screwed down through the cap 12 the inner ends of the levers 14 will be depressed with respect to said cap, their outer fulcrumed ends remaining stationary as respects vertical movement, and the cover 2 will be depressed against the mouth of the canister with a powerful sealing pressure. This pressure can be instantly relieved without any binding of the cover by screwing the spindle 16 in the opposite or outward direction. The levers 14 are mounted upon the cover 2 in the following novel manner: 19 is a pivot bead or rib upon which all the levers are strung, said bead having an enlarged upper head

portion and a contracted neck joining it to the body of the cover, as seen in Fig. 1, and the levers 14 having an open-sided recess or bead-engaging portion 20, the lips 21 21 of which approach to contract the mouth of said recess and interlock with the bead 19. The bead is formed with a reduced portion 22, as seen in Fig. 2, whereby the levers 14 may be inserted and removed by a vertical movement, the levers being moved toward or from their operative positions on the bead by a movement longitudinally of said bead. The respective levers are retained in their proper positions by means of removable pins 23 23, 80 passed through the bead 19.

It will be seen in Fig. 1 that the internal screw-thread 13 on the cap 12 is continued up the flange of said cap nearly to the top, and at the top there is provided a groove or runway 24, in which the fulcrum ends of the levers 14 are positioned. In order to allow the ends of the levers to pass into or out of this groove in assembling or taking apart the cover structure, I form the outer ends of the levers with screw-threads 25 complementary to the thread 13, whereby the cover and the levers may be screwed up into or out of the cap 12.

I claim—

1. In a chemical fire-extinguisher, an inner receptacle, a gravity-stopper, a coacting annulus arranged so as to control the outflow from the inner receptacle, the relative positions of the annulus, the stopper and the mouth of the inner receptacle forming a tortuous contracted passage for the outflow from said inner receptacle, and provisions for relatively adjusting the annulus and the inner receptacle-mouth whereby the length of said tortuous passage may be varied.

2. In a chemical fire-extinguisher, a bottle-holder, a bottle slidable axially by gravity in said holder, a gravity-stopper, a relatively-fixed annulus arranged to control the outflow from the bottle, and an abutment for the bottle arranged to permit axial sliding movement of the bottle and adjustable to vary the location which the mouth of the bottle has with respect to the annulus when the extinguisher is inverted to bring the bottle against said abutment.

3. In a chemical fire-extinguisher, a receptacle, a cover therefor, a removable outer cap, a series of radial cover-actuating levers fulcrumed at their outer ends on said cap, and a lever-actuating screw mounted in said cap and operating on the inner ends of said levers.

4. A cover for chemical fire-extinguishers, provided with a lever-pivoting bead having provisions for the insertion and removal of levers laterally thereof, and a series of cover-actuating levers strung on said bead and formed with open-sided bead-receiving portions constructed to interlock with said bead.

5. In a chemical fire-extinguisher, a recep-

tacle, a cover therefor, a cap formed with a screw-thread whereby it is attached to said receptacle, and a series of radial cover-actuating levers having their outer ends fulcrumed on said cap, said ends being formed and arranged for screwing engagement with the screw-thread on the cap.

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

ARTHUR C. BADGER.

Witnesses:

R. M. PIERSON,
GEORGE PEZZETTI.