

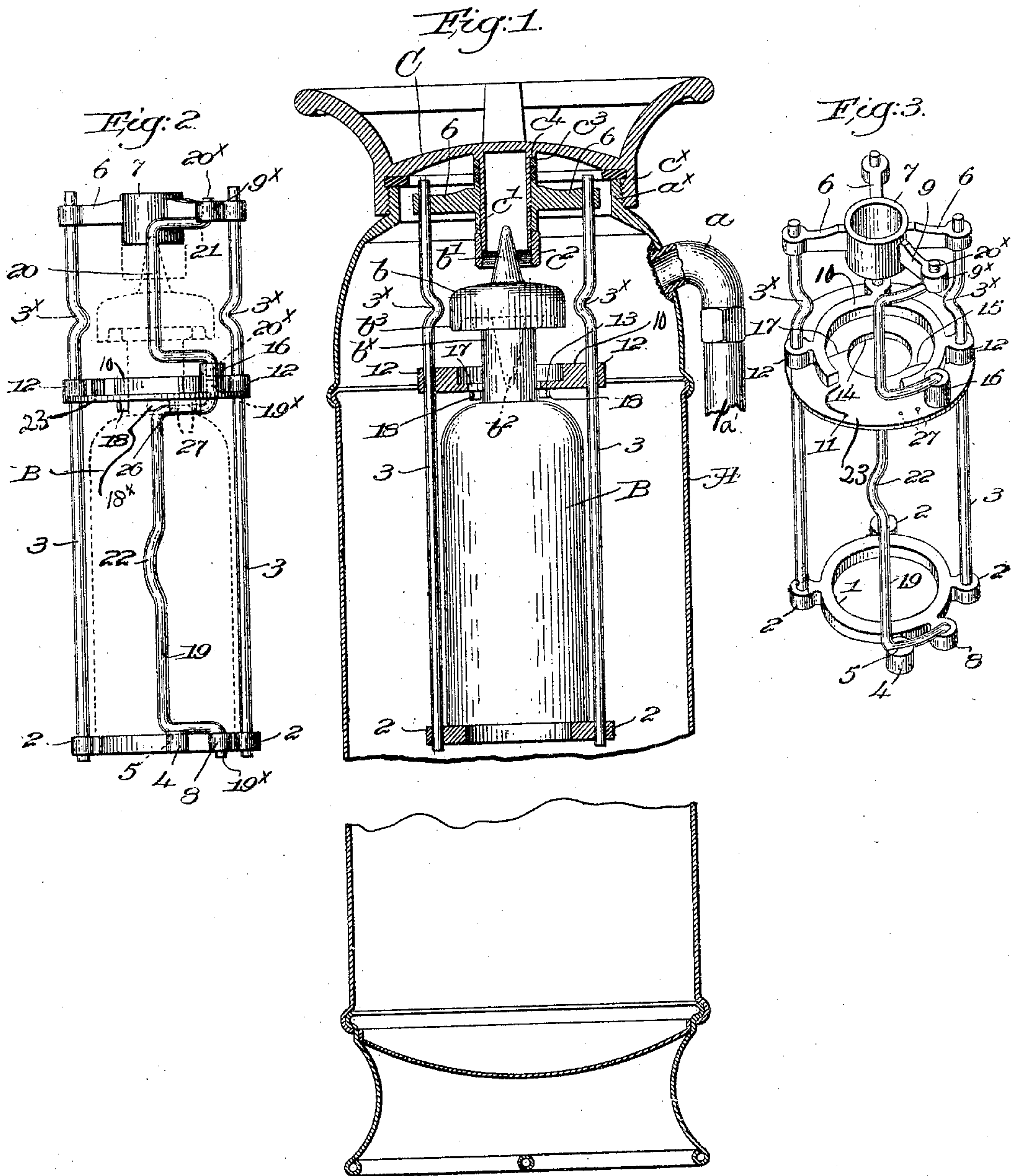
No. 796,472.

PATENTED AUG. 8, 1905.

J. B. THOMAS.
CHEMICAL FIRE EXTINGUISHER.

APPLICATION FILED NOV. 25, 1904.

2 SHEETS—SHEET 1.



Witnesses,
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L. Wm. Lutton.

Inventor:
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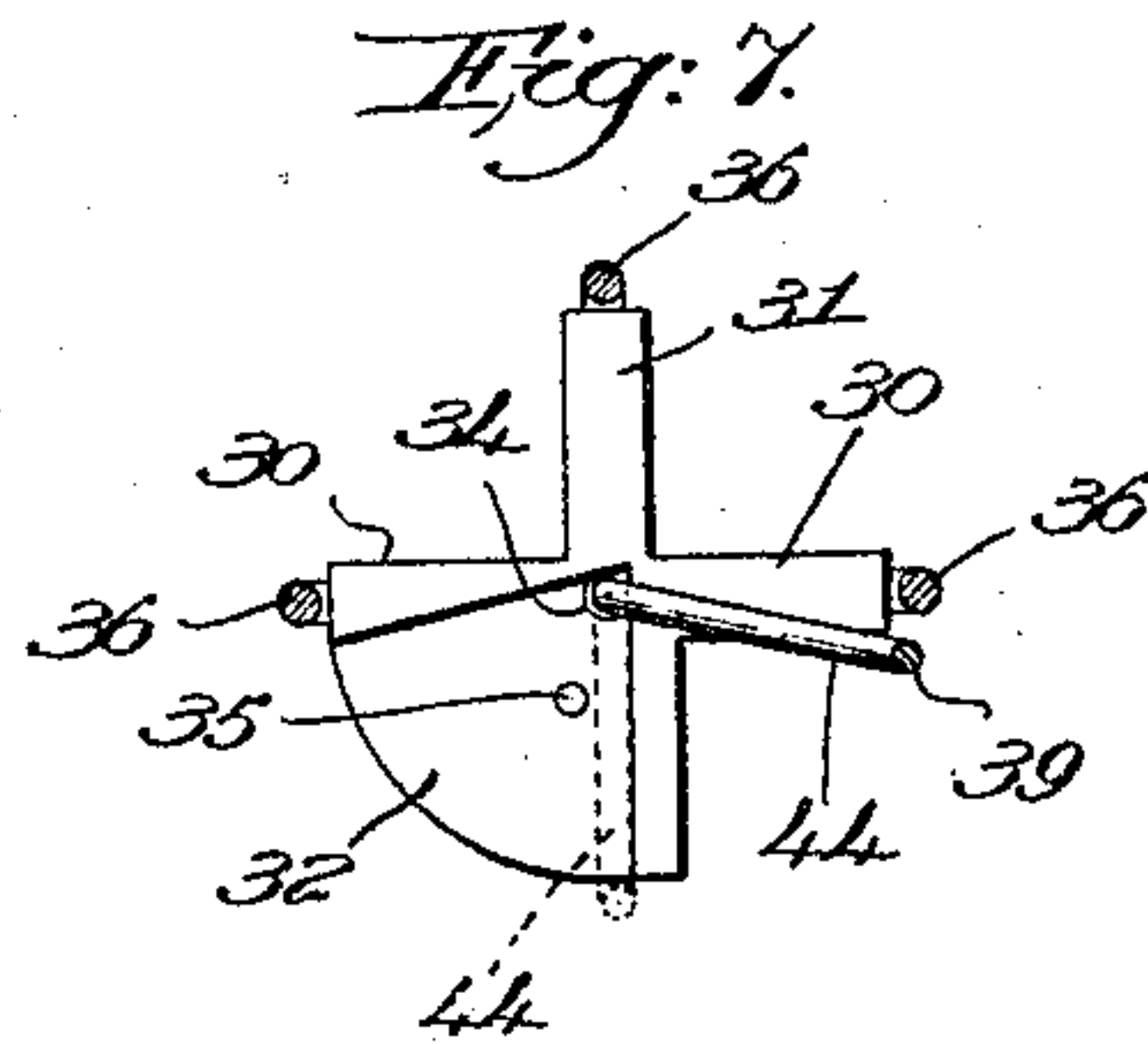
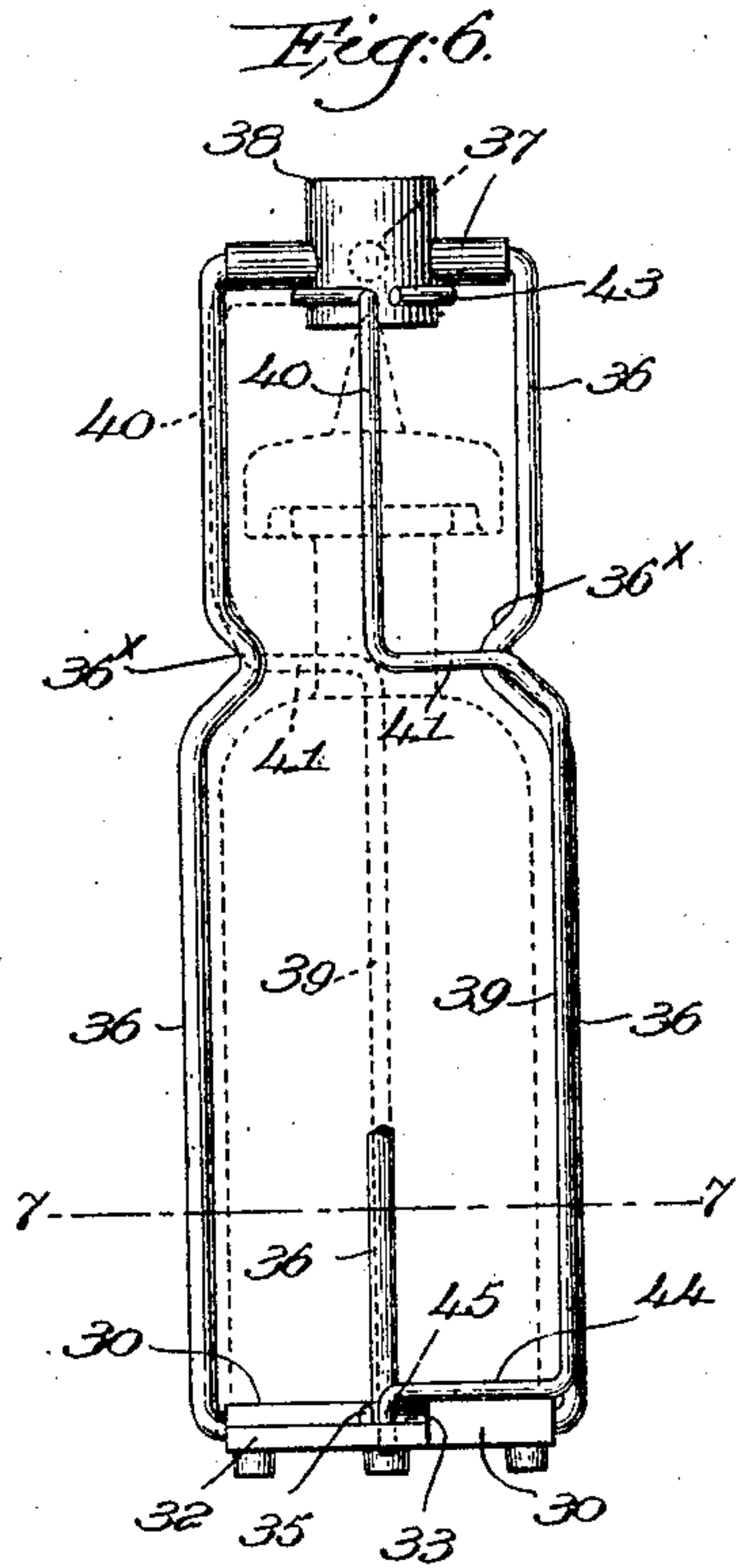
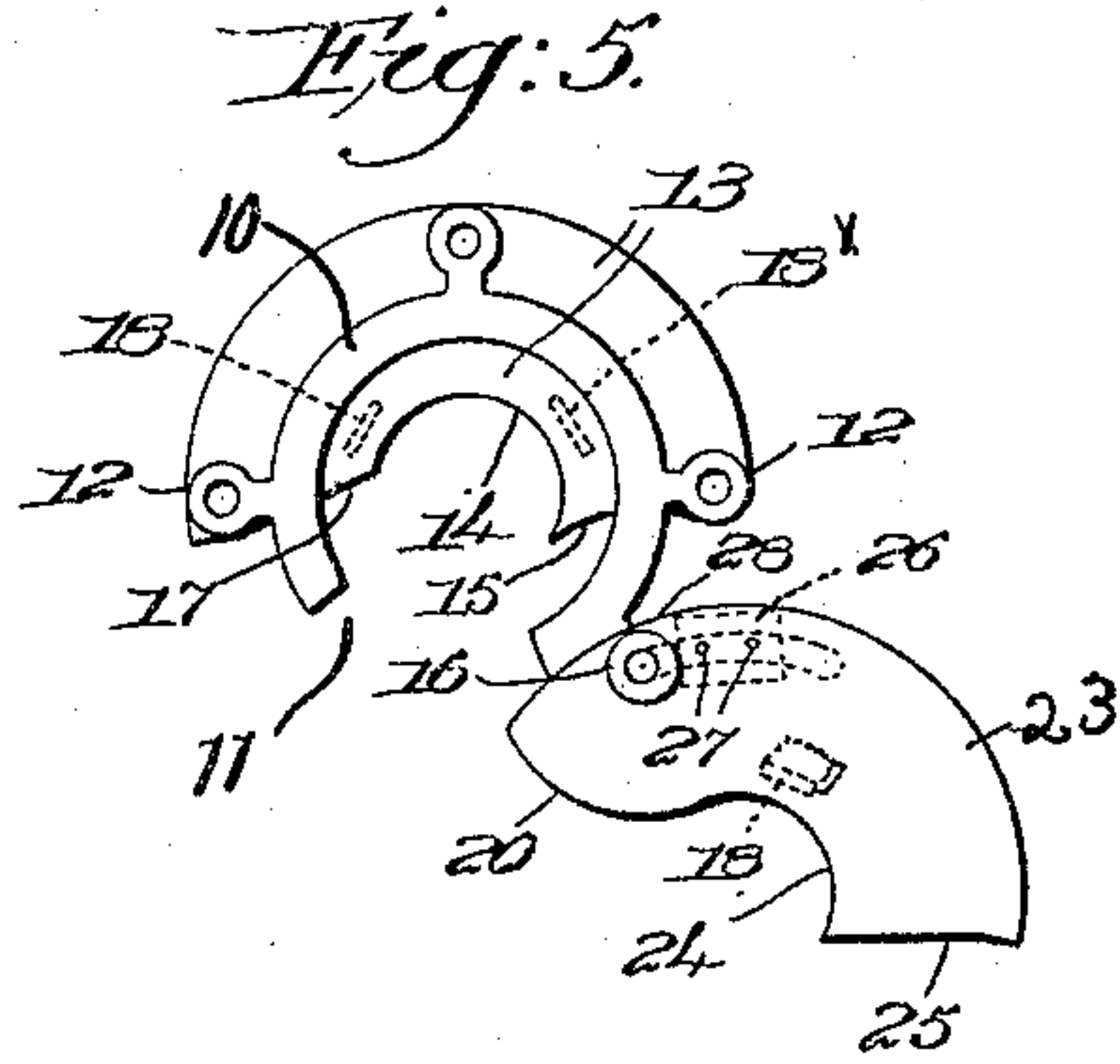
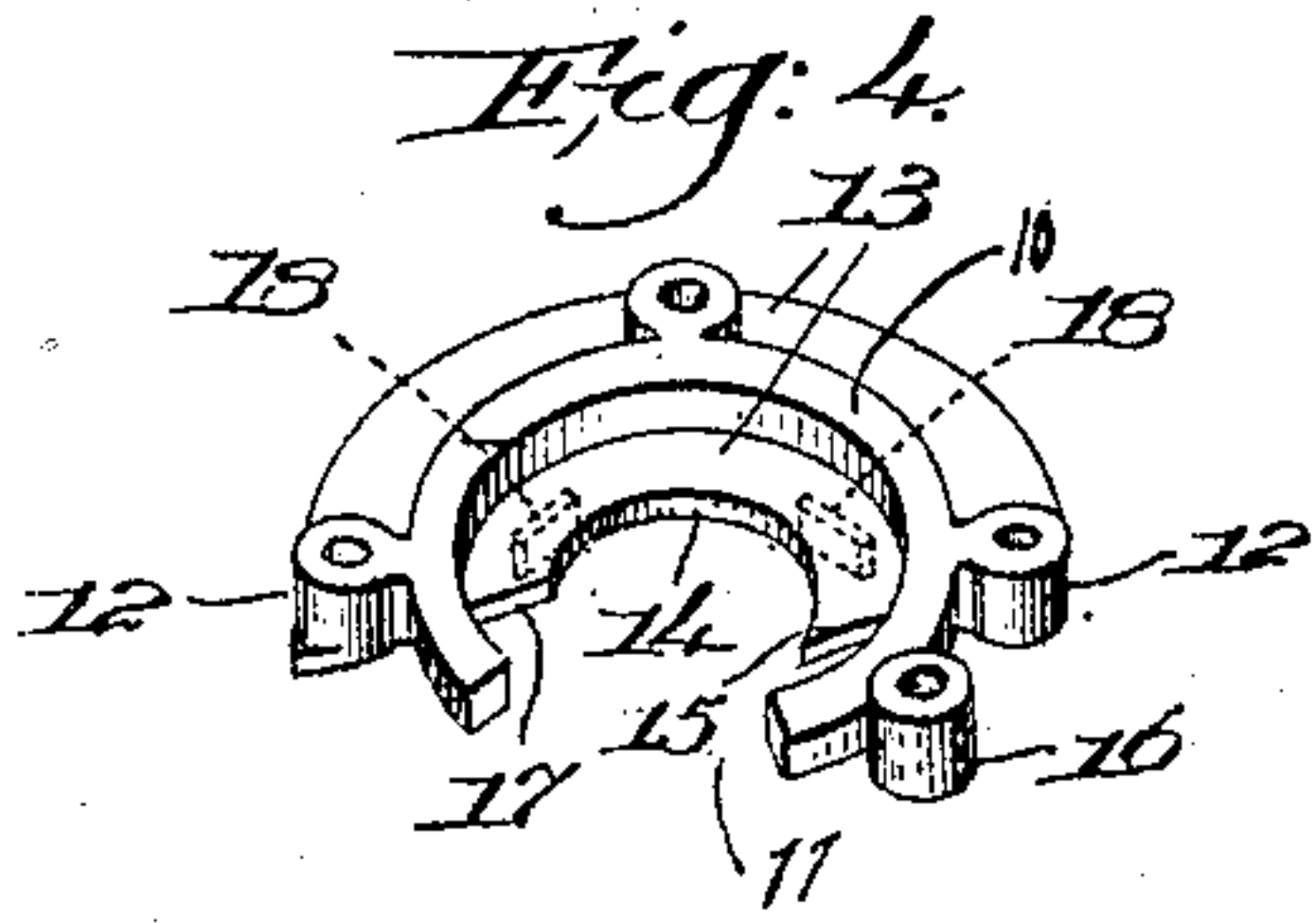
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CHEMICAL FIRE EXTINGUISHER.

APPLICATION FILED NOV. 25, 1904.

2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

JESSE B. THOMAS, OF BOSTON, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO ALFRED J. KNIGHT, OF MELROSE, MASSACHUSETTS.

CHEMICAL FIRE-EXTINGUISHER.

No. 796 472.

Specification of Letters Patent.

Patented Aug. 8, 1905.

Application filed November 25, 1904. Serial No. 234,147.

To all whom it may concern:

Be it known that I, JESSE B. THOMAS, a citizen of the United States, and a resident of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Chemical Fire-Extinguishers, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention relates to chemical fire-extinguishers comprising a main receiver or canister adapted to contain water and carbonate of soda (or other suitable mixture) and an auxiliary receiver, usually a glass bottle, adapted to contain sulfuric acid or equivalent substance located within the canister, the discharge of the contents of the bottle into the contents of the canister generating carbonic-acid gas in well-known manner.

Various bottle holders or supports have been devised to sustain the acid-bottle in proper position within the canister with its mouth sufficiently above the water-level in the canister, the reversal of the canister permitting the discharge of the acid. So far as I am aware these bottle-holders have been so constructed that the stopper must be removed when the bottle is withdrawn from the holder and replaced with the bottle.

One of the objects of my present invention is the production of a novel bottle-holder for fire-extinguishers provided with means to retain the stopper in place when the bottle is removed, as for filling. This simplifies the operation, obviates danger of losing or breaking the stopper, and insures the stopper being at hand when wanted.

Another object of my invention is the production of a bottle-holder having a side opening for the insertion of the bottle and its stopper, with a novel form of closure for the opening, rendering the manipulation of the extinguisher for charging very easy and readily understood. I have so constructed and arranged the closure means that the stopper can be removed when necessary; but the manipulation of the bottle can be conducted without disturbing the stopper or withdrawing it from the holder.

Another object of my invention is the production of means to prevent water from splashing upon or being thrown onto the mouth of the acid receptacle or bottle when

the extinguisher is carried about, and thereby obviate any weakening of the acid or any premature mixing of the acid and alkaline contents of the extinguisher. This is of particular importance when the extinguisher is often carried about from place to place, as on railroad-cars, boats, fire apparatus, &c., and it is also of importance in the ordinary house-extinguishers, for at times they are moved about, often without due care, and the liquid contents of the same tend to swash or splash around.

These and other novel features of my invention will be fully described in the subjoined specification and particularly pointed out in the following claims.

Figure 1 is a vertical sectional view of a chemical fire-extinguisher with a bottle-holder applied thereto embodying one form of my invention, the adjustable connection between the bottle-holder and the canister being shown in section and the closure being omitted, as the section is taken through the longitudinal axis of the bottle-holder. Fig. 2 is a view in side elevation of the bottle-holder detached, the bottle and its gravity-stopper being shown in dotted lines, the means for closing the side opening of the holder being shown in operative position. Fig. 3 is a perspective view of the bottle-holder, showing more clearly the breakwater. Fig. 4 is a perspective view of the fixed member of the breakwater and the part of the holder on which it is sustained. Fig. 5 is a top or plan view of the breakwater and adjacent parts, the movable member of the breakwater being shown as thrown open for the insertion or removal of the bottle. Fig. 6 is a side elevation of a modified form of bottle-holder and the closing means for the side opening thereof; and Fig. 7 is a transverse section on the line 7-7, Fig. 6, looking down.

Referring to Fig. 1, the main receiver or canister A, of well-known construction and normally adapted to stand in upright position, has at its upper end a filling-opening surrounded by an externally-threaded neck or flange a^x to engage the similarly-threaded depending flange c^x of a closing-cap C, the canister having an outlet a , to which is attached a flexible hose a' , in practice provided with a nozzle. The cap is herein shown as having a depending, central, tubular, and externally-threaded hub c' , adapted to enter an opening

in the upper end of the bottle-holder, (to be described,) a nut c^2 being then screwed onto the hub, as in Fig. 1, to retain the bottle-holder in position. This nut serves also as a guide for the gravity-stopper for the acid-bottle, as will be explained. There is sometimes a considerable variation in the length of the bottle, and in order to readily adapt the bottle-holder to such variations it is adjustably connected with the cap C. To this end I interpose washers c^3 , Fig. 1, between the top of the holder and the upper end of the hub c' , which is shown as shouldered at c^4 , the more washers being used the lower will be the nut c^2 on the hub, and consequently the shorter the distance between the nut and the mouth of the bottle. Such adjustment enables me to regulate the opening movement of the stopper, and thereby control the feed of the acid when the extinguisher is in use. The gravity-stopper or closure b for the bottle is provided with oppositely-extended projections b' b^2 , the latter extending into the neck of the bottle, while the former extends into the nut c^2 and the hub c' , the stopper having a depending lip b^3 , adapted to fit around the bottle-neck and forming a tight joint with the same under normal conditions.

The stopper is substantially such as shown and described in United States Patent No. 598,826, and operates as set forth therein.

The bottle-holder is in my present invention made cage-like and comprises top and bottom members and side rods rigidly connecting the same. Referring to Fig. 3, the bottom member is shown as a flat ring 1, having at its periphery bosses 2, to which are secured the lower ends of the side rods 3, preferably made of stout rigid wire. The member 1 is conveniently made as a casting, and I have shown it as having a fourth boss 4, the three bosses 2 and said boss 4 being ninety degrees apart, the boss 4 having in its upper face a locking notch or groove 5. A side opening is formed by omitting the side rod for the boss 4, such opening being large enough to permit insertion or removal of the bottle with perfect ease. The upper ends of the rods 3 are tightly secured to radial arms 6 on a central ring or hollow hub 7 of such internal diameter as will easily slip over the hub c' , hereinbefore referred to, the arms 6 corresponding angularly to the positions of the three bosses 2, the arms 6 and hub 7 constituting the top member of the bottle-holder. Between the boss 4 and one of the nearest bosses 2 the bottom member has a radial projection or boss 8, and a correspondingly-located arm 9 is formed on the top member, for a purpose to be referred to.

The bottle B rests on the base 1, and the projection b^2 of the stopper extends into the bottle-neck b^x . (See Fig. 1.)

It is desirable to prevent undue lateral play of the stopper, and to this end I have shown

the side rods 3 bent inward, as at 3^x , to closely approach the body portion of the stopper, Fig. 1, and thereby retain it in substantially central position without in any way interfering with its proper operation when the extinguisher is put into use.

Between the top and bottom of the bottle-holder I have provided means to support the stopper when the bottle is removed, so that when it is desired to refill the bottle, for instance, it is only necessary to remove it, the stopper remaining in the holder. In the construction shown in Figs. 1 and 3 this support is shown as a ring-like member 10, having an opening 11 (best shown in Figs. 4 and 5) and peripheral bosses 12, through which the rods 3 pass and to which they are soldered or otherwise rigidly attached. The member 10 is preferably made as a casting, and it is so located that the bottle-neck projects upward through it when the bottle is in place, the width of the ring being such that the lip b^3 of the stopper will rest upon it when the bottle is removed, the projection b' still remaining in the guide c^2 .

In order to prevent the water in the canister from splashing up under the stopper and thence into the mouth of the bottle, I have provided a breakwater and comprising fixed and movable parts. The fixed part is shown as a thin web 13, secured to or forming a part of the support 10 and having a substantially semi-circular periphery extending from one to the other of the two diametrically opposite bosses 12. The inner edge of the web is circularly recessed at 14 to snugly embrace one-half of the bottle-neck (see Figs. 3, 4, and 5) and is curved at 15 on an arc struck from the center of the boss 16, which latter is in alinement with the boss 8 and a boss 9^x on the arm 9 of the top member of the holder. The recess 14 does not directly face the opening 11 in the member 10, as shown in Fig. 5, but allows ample clearance for the bottle-neck when the bottle is withdrawn. From the recess 14 to the periphery of the web at the left, Figs. 3, 4, and 5, the edge may be straight, as shown at 17. Stops 18 are formed on the under side of the web to engage the breast of the bottle when the extinguisher is inverted to limit longitudinal movement of the bottle and prevent interference with the proper feed of the acid.

The boss 16 is made longer from top to bottom than the bosses 12, and, like the bosses 8 and 9^x , is perforated in parallelism with the longitudinal axis of the holder, the three alined bosses 8, 16, and 9^x supporting the means for closing the side opening of the bottle-holder, which is divided by the ring 10 into a lower bottle-compartment and an upper stopper-compartment.

I have shown the closing means as two U-shaped bails 19 20, made of stout wire and having their extremities oppositely turned, as at 19^x 20^x , the former constituting pintles, which

are loosely inserted in the holes in the bosses 8 and 16. The extremities 20^x of the bail 20 are loosely inserted in the holes in the bosses 16 and 9^x, the boss 16 being deep enough to receive a pintle of each bail, the bails being thus movable in a curved path about fulcra in parallelism with the longitudinal axis of the bottle-holder. When the bails are swung inward to operative position, they occupy a position substantially at the middle of the side opening of the bottle-holder, as shown in Figs. 1, 2, and 3, and thereby close the side opening thereof. The lower arm of bail 19 is adapted to snap or spring into the locking-notch 5 in the boss 4, to thereby be locked in operative position, a smart pull with the fingers being requisite to release it when the bottle is to be removed or inserted. A similar locking-notch 21 in the boss 9^x (see Fig. 2) locks the bail 20 in operative or closing position. The bail 19 is preferably provided with a slight outward bend 22, Figs. 1 and 2, to facilitate engagement by the fingers of the operator when opening the bail.

The movable or complementary member of the breakwater is made as a thin plate or web 23, (see Fig. 5,) having its outer edge curved on a radius equal to that of the member 13, its inner edge having a semicircular recess 24 to embrace the bottle-neck, a straight end 25 and a curved portion 26 struck from the center of the boss 16 to fit the concave edge 15 of the web 13 when the member 23 is swung into place. Said member is attached rigidly to the bail 19 in any suitable manner, as by a depending and longitudinally-grooved lug 26 on its under face, in which the bend of the bail is soldered and pinned, if desired, as at 27, Fig. 5. An ear 28 on the periphery of the member 23 projects under the boss 16 and is apertured to let the pintle 19^x pass through it and up into the boss.

When the bail 19 is swung outward, the member 23 moves with it into the position shown in Fig. 5, so that the bottle can be removed from the holder without obstruction. When the bail is in closing position, however, the opposed recesses 14 and 24 make a circular opening to closely surround the bottle-neck below the gravity-stopper, the convex edge 26 fits snugly into the concave edge 15, and the straight portions 17 and 25 of the two members of the breakwater abut. Thus the neck of the bottle below its mouth will be surrounded by a large circular disk-like breakwater, so that the liquid in the canister cannot slop or splash up onto the mouth of the bottle.

It will be observed that the bottle can be removed without disturbing the stopper, which is retained in place by the bail 20 and the ring or support 10, so that the stopper will always be in readiness for use when the bottle is inserted after charging. To remove the stopper, the bail 20 is swung outward.

The bails 19 and 20 constitute a closure pivotally mounted at the upper and lower ends on the holder and adapted to be swung into or out of operative position on fulcra in parallelism with the longitudinal axis of the bottle-holder.

In Fig. 6 I have shown a modified form of bottle-holder and closure for the side opening thereof, the base being made as a casting having three radial arms 30 31 and a flat segmental portion 32 adjacent one of the arms 30. The edge of the segment at right angles to the arms 30 is raised to form a cam 33 at one side of a hole 34, Fig. 7, in the center of the base, a stop-lug 35 rising from the segment. Side rods 36 are rigidly secured to the ends of the arms 30 and 31 and extend upward therefrom at right angles thereto to similarly-located arms 37, radiating from a hollow boss or hub 38 and constituting the top of the bottle-holder. The hub 38 corresponds in function to the hub 7, hereinbefore described in the other form of bottle-holder, and is adapted to slip over the boss *c'*, depending from the cap of the extinguisher. The side rods are bent inward at 36^x, Fig. 6, at such a height that they will project over the breast of the bottle and limit its movement when the extinguisher is inverted. They also serve to support the stopper when the bottle is removed from the holder. The space between the opposite side rods constitutes the side opening for the entrance or removal of the bottle. A peculiar form of closure is used in connection with this holder, it being made of a single piece of wire bent to present two parallel portions 39 and 40, connected by a lateral bend 41, substantially at the height of the bends 36^x. At its upper end the part 39 is turned inward toward the hub 38, as at 42, (see dotted lines, Fig. 6,) and then is formed into a circular loop 43, which loosely embraces said hub below its arms. The lower end of the part 39 is bent inward at 44 substantially at right angles to the part 42 and then downturned at its extremity at 45 to form a pintle, which loosely enters the hole 34 in the base. (See Fig. 6.) Now when the closure is in full-line position, Fig. 6, the bend 44 rests on top of the cam 33, and the upright portion 39 is swung up against the right hand one of the opposite side rods 36, thereby opening the lower part of the holder to permit the bottle to be inserted or removed. At such time the upright part 40 of the closure is midway between the opposite side rods 36 and prevents removal of the stopper, as will be manifest. Supposing the bottle to have been inserted in the holder, the closure is swung into dotted-line position, Fig. 6, on the pintle 45 and the hub 38 as fulcra, whereupon the part 39 closes the side opening and the bottle is retained in position. At such time the resiliency of the wire causes the bend 44 to snap down off the

cam 33 onto the segmental portion 32 of the base between the cam and the stop-lug 35, so that the closure is maintained in operative position. The upright part 40 will then be adjacent the left-hand one of the opposite side rods, and the side opening opposite the stopper is unobstructed. The stopper cannot, however, be removed, because the oppositely-extended projections thereof are held the one in the neck of the bottle and the other in the stopper-guide c^2 , previously referred to. Should it be necessary to remove the stopper, however, it can be readily accomplished by removing the bottle and then swinging the closure into dotted-line position, Fig. 6, whereupon the stopper can be lifted out. When the bottle and stopper are in position, the closure will be moved into its dotted-line position and retained therein by the action of the lug 35 and side of the cam 33 upon the bend 44. I have not shown any breakwater in this form of bottle-holder, it being adapted for use generally in extinguishers not liable to be jarred or moved about violently under normal circumstances.

If desired, a stop-plug 18^x may be formed on the under side of the movable member of the breakwater, (shown in Figs. 1, 2, and 3,) to cooperate with the stops 18 in limiting longitudinal movement of the bottle when the extinguisher is inverted for use.

My invention is not restricted to the precise construction and arrangement herein shown, as the same may be modified or changed in different particulars by those skilled in the art without departing from the spirit and scope of my invention.

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

1. A fire-extinguisher comprising a canister having a filling-opening at one end, a cap to close the same, a bottle-holder attached to and depending from the cap and having a side opening for the insertion or removal of the acid-bottle and its stopper, a removable gravity-stopper adapted to close the mouth of a bottle in the holder, and means movable into and out of the side opening of and fulcrumed on the holder, to prevent removal of the bottle or the gravity-stopper through the side opening of the holder.

2. A fire-extinguisher comprising a canister having a filling-opening at one end, a cap to close the same, a bottle-holder supported within and near the upper end of the canister and having a side opening, a removable gravity-stopper adapted to close the mouth of a bottle in the holder, a fixed support on the holder between the top and bottom thereof for the stopper when the bottle is removed, and means pivotally mounted at its upper and lower ends on the holder and movable into and out of the opening above and below the said fixed support, to prevent removal of the

bottle or its stopper through the side opening of the holder.

3. A fire-extinguisher comprising a canister having a filling-opening at one end, a cap to close the same, a bottle-holder supported within the canister and having a side opening, a gravity-stopper adapted to close the mouth of a bottle in the holder, intumed means on the holder between its upper and lower ends to vertically sustain the stopper when the bottle is removed, and laterally-swinging means fulcrumed on the holder in parallelism with its longitudinal axis to close the side opening thereof.

4. A fire-extinguisher comprising a canister having a filling-opening at one end, a cap to close the same, a depending bottle-holder sustained at its upper end only within and at the upper end of the canister, a gravity-stopper adapted to close the mouth of a bottle in the holder, and a two-part, separable breakwater carried by the holder and adapted when closed to surround the bottle-neck within the holder below the stopper and above the breast of the bottle, to prevent the contents of the canister from splashing upon or entering the mouth of the bottle.

5. A fire-extinguisher comprising a canister having a filling-opening at one end, a cap to close the same, a depending bottle-holder sustained at its upper end within the canister, a gravity-stopper adapted to close the mouth of and connected with a bottle in the holder, a stopper-guide at the upper end of the holder, a two-part separable breakwater mounted on the latter independently of the canister and adapted when closed to surround the bottle-neck above the breast of the bottle and below the stopper, and means to limit longitudinal movement of the bottle in said holder when the canister is inverted, the guide serving at such time to limit the opening movement of the stopper.

6. A fire-extinguisher comprising a canister having a filling-opening at one end, a cap to close the same, a bottle-holder attached to and supported wholly by the cap and depending into the canister, an adjustable, tubular stopper-guide at the upper end of and rigidly connected with said holder, a gravity-stopper adapted to close the mouth of a bottle in the holder, and means on the holder to limit longitudinal movement of the bottle when the canister is inverted, the stopper-guide at such time limiting the opening movement of the stopper.

7. A fire-extinguisher comprising a canister having a filling-opening at one end, a cap to close the same, a tubular, externally-threaded hub depending from the cap, a bottle-holder having an annular opening at its upper end to embrace the hub, a retaining-nut adapted to screw onto the latter and retain the holder thereon, the nut also serving as a stopper-guide, means to retain the holder from move-

ment on the hub when the canister is inverted, an acid-bottle removably mounted in the holder, a gravity-stopper to close the mouth of the bottle, and means to retain the bottle and stopper in the holder.

8. A fire-extinguisher comprising a canister having a filling-opening at one end, a cap to close the same, a hub on and depending from the cap, a bottle-holder having an annular opening at its upper end to embrace the hub, means to adjustably retain the holder thereon, a gravity-stopper adapted to close the mouth of a bottle in the holder, means on the latter to vertically support the stopper when the bottle is removed, and means to at such time prevent removal of the stopper.

9. A fire-extinguisher comprising a canister having a filling-opening at one end, a cap to close the same, a bottle-holder sustained at its upper end within the canister and having a side opening for the insertion and removal of the bottle and its stopper, means pivotally mounted at its upper and lower ends on the holder to swing into and out of the opening, a breakwater comprising a member fixedly mounted on the holder and having a recessed portion adapted to receive the neck of the bottle, and a complementary member also having a recessed portion, and mounted on the closing means, whereby when the latter is swung into operative or inoperative position the breakwater will inclose or free the bottle-neck, respectively.

10. A bottle-holder for chemical fire-extinguishers, having a side opening for the insertion and removal of the bottle and its stopper, means to divide the holder into stopper and bottle receiving compartments, and swinging means to close the opening of each compartment, and fulcrumed upon and in parallelism with the longitudinal axis of the holder.

11. A bottle-holder for chemical fire-extinguishers, having a contracted inwardly-extended portion between its ends to surround the neck of the bottle, and a side opening for the insertion or removal of the bottle, and laterally-swinging means positively connected with the holder and adapted to close the opening above and below said contracted portion and retain the bottle in the holder.

12. A bottle-holder for chemical fire-extinguishers, having a side opening for the insertion and removal of the bottle and its stopper, a contracted portion between the ends of the holder, dividing the same into bottle and stopper compartments, and means positively connected with the holder and movable in a circular path into and out of the side opening thereof, to retain in the holder the bottle and stopper or permit the removal thereof through the side opening.

13. A bottle-holder for chemical fire-extinguishers, having a side opening for the insertion and removal of the bottle and its stopper, an elongated bail having offset arms at its ends fulcrumed at fixed points on the holder and adapted to move into and out of the side opening thereof, and a snap-lock to retain the bail in the opening, to prevent removal of the bottle or the stopper.

14. A bottle-holder for chemical fire-extinguishers, comprising top and bottom members, side rods rigidly connecting the same to form a cage-like structure, inturned means on the side rods between their upper and lower ends, to divide the holder into stopper and bottle compartments, and to sustain the stopper when the bottle is removed, two of the side rods being more widely separated to form a side opening for the insertion or removal of the bottle and its stopper, and a closing device for said opening, pivoted at its ends on the holder to swing about fulcrum parallel to the longitudinal axis of the holder into and out of the side opening above and below the said inturned means, to thereby close or open said compartments.

15. A bottle-holder for chemical fire-extinguishers, comprising top and bottom members, side rods rigidly connecting the same to form a cage-like structure, two of the side rods being more widely separated to form a side opening for the insertion or removal of the bottle and its stopper, means between the top and bottom members to support a bottle-stopper when the bottle is removed, and swinging means to close the side opening above and below the stopper-supporting means.

16. A bottle-holder for chemical fire-extinguishers, comprising top and bottom members, side rods rigidly connecting the same to form a cage-like structure, two of the side rods being more widely separated to form a side opening for the insertion or removal of the bottle and its stopper, means located between the top and bottom members to receive the bottle-neck and support the stopper when the bottle is removed, stops to limit longitudinal movement of the bottle when the bottle-holder is reversed, and separate means to close the side opening above and below the stopper-supporting means, whereby the stopper may be retained in the holder when the bottle is removed.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JESSE B. THOMAS.

Witnesses:

JOHN C. EDWARDS,

ELIZABETH R. MORRISON.