

(No Model.)

A. H. DURAND.  
FIRE EXTINGUISHER.

No. 580,780.

Patented Apr. 13, 1897.

Fig. 1.

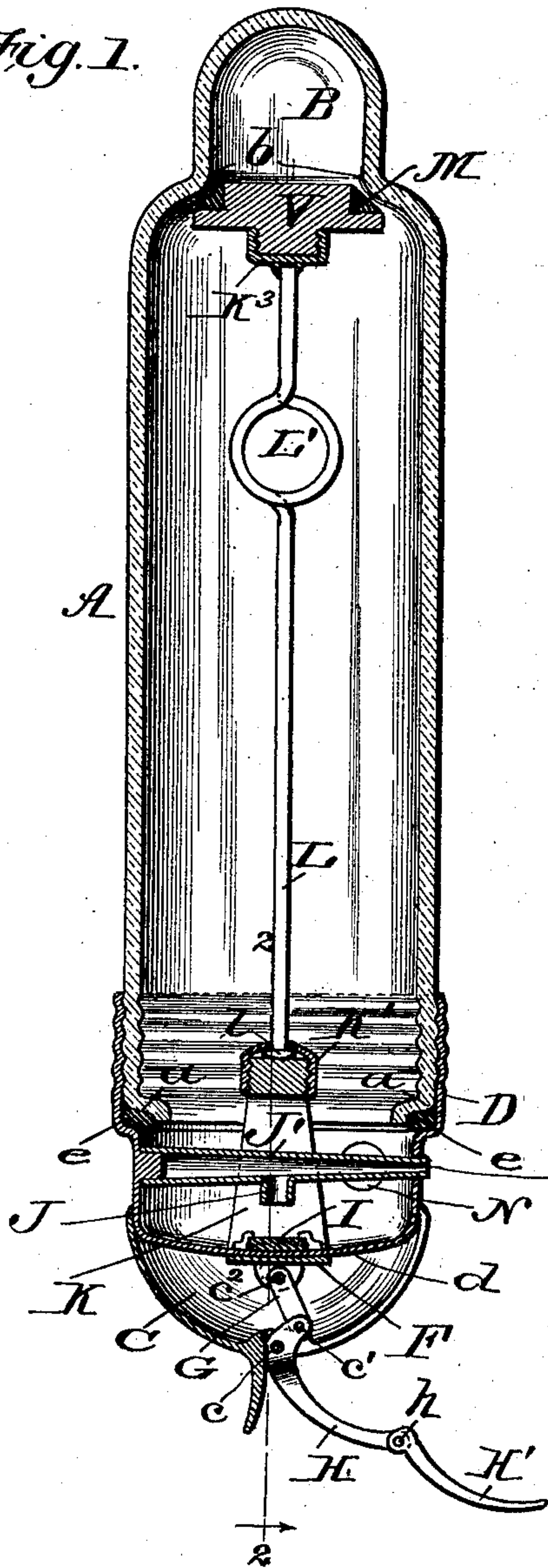
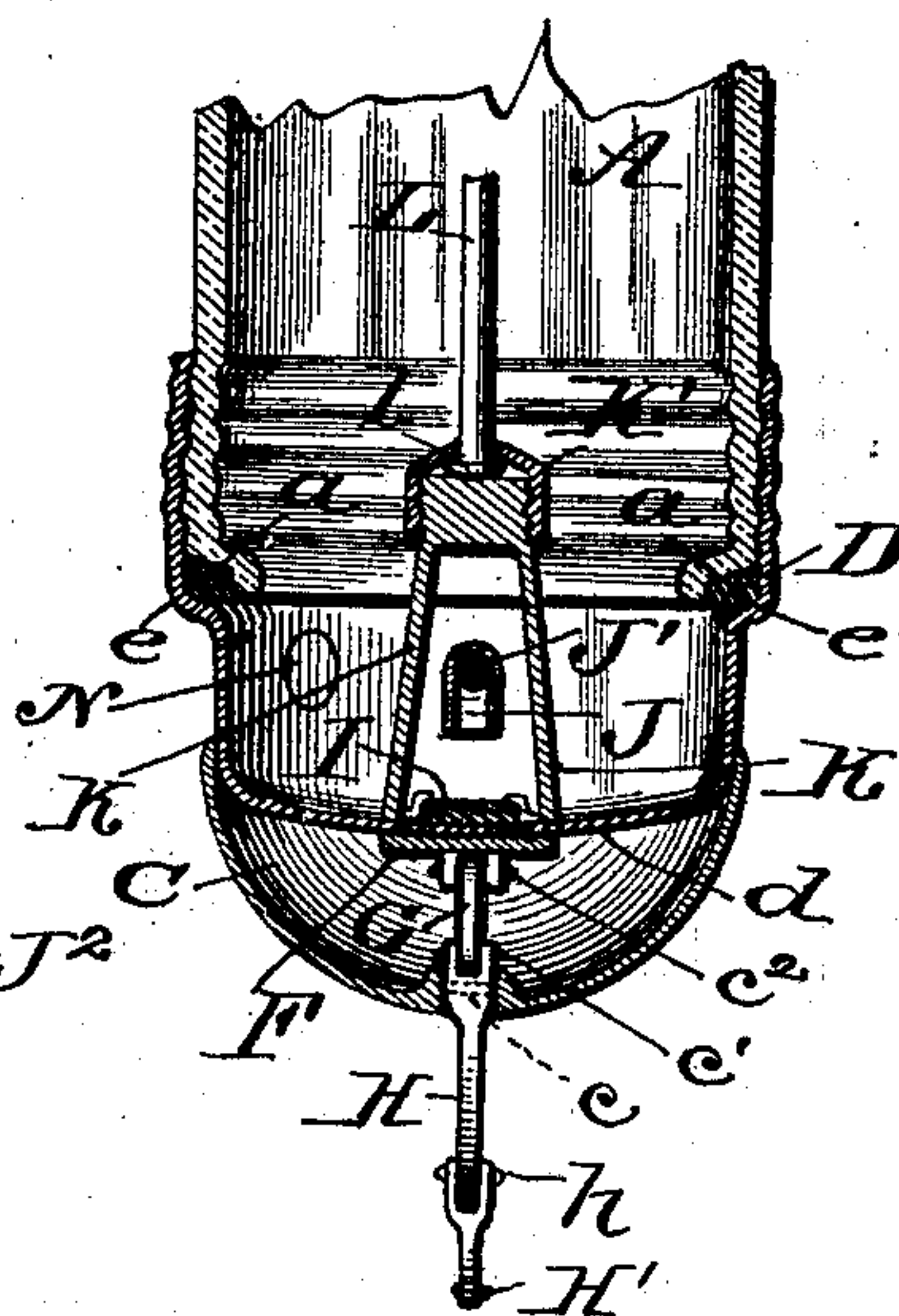


Fig. 2.



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# UNITED STATES PATENT OFFICE.

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## FIRE-EXTINGUISHER.

SPECIFICATION forming part of Letters Patent No. 580,780, dated April 13, 1897.

Application filed April 4, 1896. Renewed March 20, 1897. Serial No. 628,524. (No model.) Patented in Canada October 9, 1895, No. 50,220.

*To all whom it may concern:*

Be it known that I, ARTHUR HYPOLITE DURAND, a citizen of the French Republic, at present residing in Montreal, Province of Quebec, and Dominion of Canada, have invented certain new and useful Improvements in Fire-Extinguishers, (for which I have obtained a patent in Canada, dated October 9, 1895, No. 50,220;) and I do hereby declare the following to be a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention refers to the class of portable fire-extinguishers which operate by the admixture of an acid with a solution of bicarbonate of soda to generate carbonic-acid gas, and it has for a distinctive feature its acid-receptacle, formed by a contraction of the vessel containing the alkaline solution, and so arranged that the acid can be slowly admitted and not all at once, so that the pressure can be regulated and thus avoid the danger of the bursting of the extinguisher, which sometimes happens for the simple reason that all the acid being poured into the alkaline solution at once there is an enormous volume of carbonic-acid gas formed suddenly, and consequently rupture is apt to take place.

My object is to provide a small extinguisher that will be perfectly safe and of sure operation.

Figure 1 is a vertical longitudinal section, and Fig. 2 is a partial section on line 2 2 of Fig. 1.

A is a strong glass receptacle terminating at its upper end in a chamber B, connecting therewith and separated by an annular contraction *b*. The chamber B could be of any suitable form and serves to contain the acid.

The lower end of my receptacle A is provided with screw-threads, as shown, onto which is screwed the cap or stopper D, made of suitable material and having the bottom *d* flexible, on which is soldered a housing C of rigid material. To form a tight joint between the cap D and receptacle A, I mount the rubber gasket *e* between the shoulder *a* on the receptacle A and the one on the cap D. In one side of the cap D is an opening

N, closed with a screw-cap. Firmly secured to the bottom *d* of the cap is the plate F, having two ears, between which is inserted the link G, jointed by a pin *c*<sup>2</sup> to the plate F, and also jointed at the lower end *c'* to the short arm of the trigger H. The trigger H is in the form of an elbow-lever jointed at an angle to the housing C at *c*, and the three centers *c* *c'* *c*<sup>2</sup> are so arranged as to form, when closed, a lock-joint by the center *c'* passing beyond a straight line from *c'* to *c*<sup>2</sup>, so as to secure a safe closing. The trigger is made with an extended section H', jointed at *h*, so as to fold more compactly against the side of the vessel when closed and afford more leverage when open. Inside and secured to the flexible bottom *d* is a cushion or pad made of cork or soft material, so as to close the opening J of the cross-tubing J'. This tubing J' is firmly soldered at both ends to the cap D, and its smaller end opens into the outer air and forms a nozzle J<sup>2</sup>, while the other end is closed.

Firmly secured on the cap D is a yoke-shaped standard K, on which is screwed a screw-cap K', serving to maintain a rod L, having a coil-spring L', formed by one or more coils of the rod L. Said rod has its lower end terminated by a half-spherical head *l*, over which is screwed the cap K'. At the top the rod is firmly soldered on a tin screw-cap K<sup>3</sup>, and the latter is screwed on a stopper or valve V, made of glass or any suitable material and having a groove in which is inserted a rubber gasket M in order to make a tight joint to the acid-chamber, as shown and described.

The tube J' is arranged between the legs of the yoke K with the opening J immediately above the cushion-stopper I.

To charge my extinguisher, the acid is first put in the receptacle A with the acid-chamber B turned downwardly, and the acid is worked so as not to soil the valve V. Then I screw the cap D on the receptacle A, so that the valve V makes a tight joint against the leakage of the acid from the chamber B. The rod-spring L' prevents any undue strain from being placed on the stopper or valve V. Then the alkaline solution of bicarbonate of soda or its equivalent is poured into the recepta-



cle A through the opening N, on which a screw-stopper is placed, and the extinguisher is ready for use.

To use it, the only thing to be done is to pull down the trigger H H', attached or connected to the bottom by the pieces G and F, which causes the flexible bottom to be depressed, and at the very same instant the opening J is uncovered and the valve V is depressed, and the acid flows into the alkaline solution in the receptacle A, thus forming the carbonic-acid gas. As can readily be seen, the amount of acid to be admitted is easily controlled when the pieces are put together in manufacturing the device, so that no undue strain will take place on the apparatus when used.

The liquid charged with carbonic-acid gas and under pressure is directed to any desired locality by presenting the nozzle J<sup>2</sup> in the desired direction.

This machine can be easily recharged at any drug-store, as no pieces are broken or out of order after having been used.

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

1. A fire-extinguisher comprising an acid-receptacle and a larger alkaline-solution receptacle, both made in one piece and of the same material, and the acid-chamber being formed by a contraction of the walls of the main body to form a shoulder or valve-seat, a partition-valve or stopper arranged in the larger chamber to be seated upon the contracted shoulder of the acid-receptacle to separate the two chambers, and means for operating said valve from the outside substantially as shown and described.

2. A fire-extinguisher comprising an acid-chamber and a larger alkaline-solution chamber communicating with each other, a partition-valve or stopper for separating the two chambers, a nozzle or discharge-outlet having an opening into the larger chamber, and a stopper for said opening a rod connected thereto and arranged within the solution-chamber and connected to and operated simultaneously with the partition-valve substantially as and for the purpose described.

3. A fire-extinguisher having an acid-chamber and an alkaline-solution chamber opening into each other, a partition-valve separat-

ing said chambers, and a closing-cap for the alkaline-solution chamber having a flexible or elastic end, said valve being connected to said flexible cap and operated from the outside by its collapsing or expanding movement substantially as and for the purpose described.

4. A fire-extinguisher comprising an acid-chamber and a larger alkaline-solution chamber communicating with each other, a partition-valve or stopper for separating the two chambers, a nozzle or discharge-outlet having an opening into the larger chamber, a stopper for said opening and means for connecting said stopper and partition-valve, said means having a spring interposed in it to transmit an elastic pressure to said partition-valve substantially as and for the purpose described.

5. A fire-extinguisher having two chambers formed in one piece for the acid and alkaline solution respectively, a partition-valve for separating these two chambers, a flexible end cap, an internal rod connecting said valves to the end cap, and a lever for operating the valve through the end cap with a gradual motion to gradually mix the acid with the alkaline solution substantially as shown and described.

6. The combination of receptacle A having contracted end B forming an acid-receptacle and a valve-seat, the stem L with spring L' formed in the same, the cap D with flexible end, bearing cushion-stopper I and yoke K having a swiveling connection with the stem, the cross-tube J' having an external nozzle J<sup>2</sup> and an internal opening J, and means for operating the flexible cap substantially as and for the purpose described.

7. The combination with the fire-extinguisher having a flexible end cap; of means for collapsing or expanding said cap comprising a housing, an elbow-lever H pivoted thereto and connected by a link with the end cap to lock the centers, and a supplemental articulated section H' for said lever adapted to fold compactly against the side of the receptacle, or be extended to give a greater working leverage substantially as shown and described.

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Witnesses:

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