

(No Model.)

2 Sheets—Sheet 1.

A. H. DURAND.
FIRE EXTINGUISHER.

No. 470,293.

Patented Mar. 8, 1892.

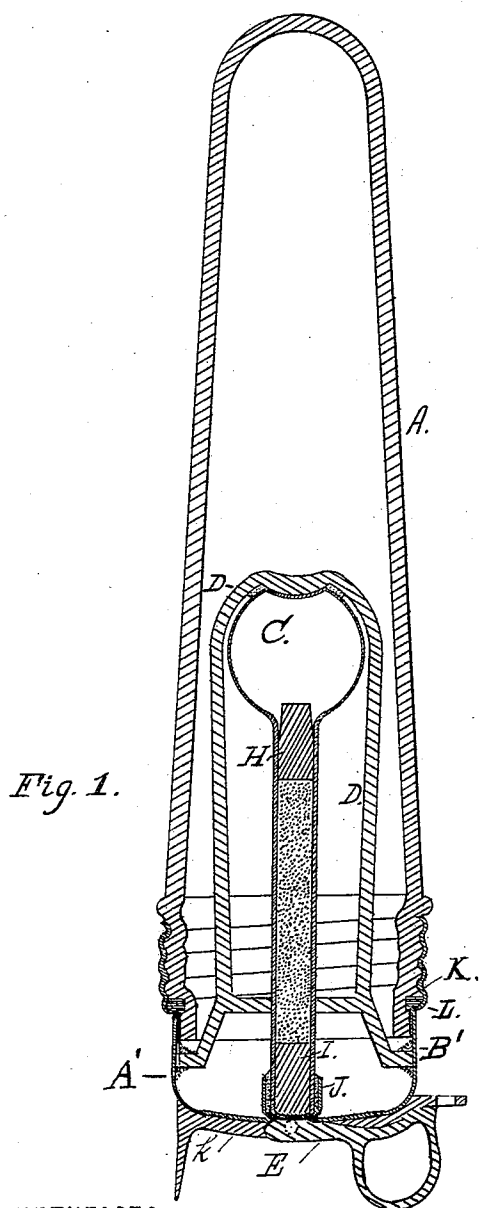


Fig. 1.

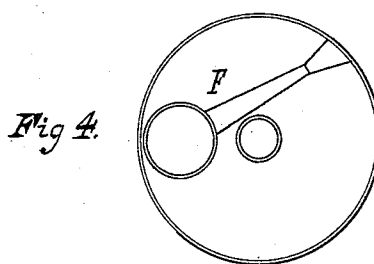


Fig 4.

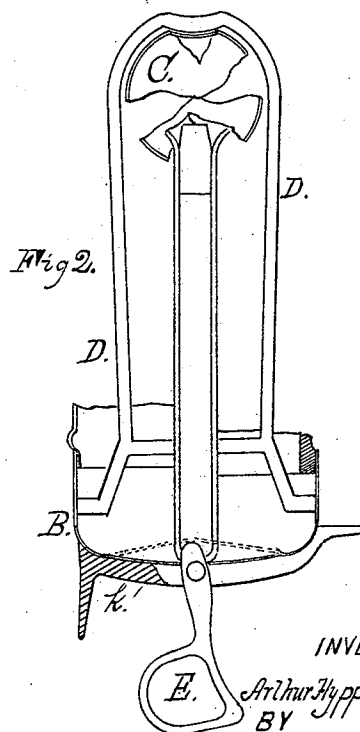


Fig 2.

WITNESSES:

L. Newton Gregg
W. Morris Clem

INVENTOR

Arthur Hyppolite Durand
BY
Ashton Ramsay
ATTORNEY.

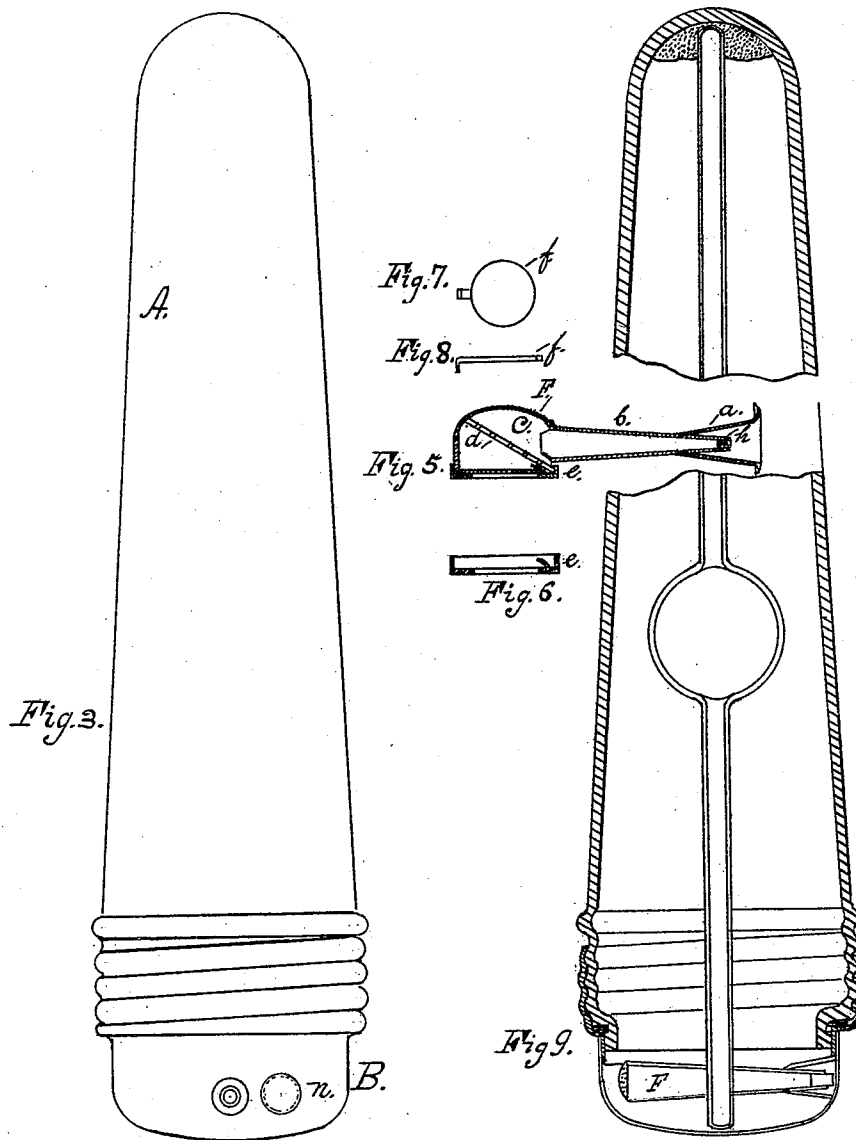
(No Model.)

2 Sheets—Sheet 2.

A. H. DURAND.
FIRE EXTINGUISHER.

No. 470,293.

Patented Mar. 8, 1892.



WITNESSES:

L. Newton Gregg
H. Morris Vroom

INVENTOR

Arthur Hippolyte Durand

BY

Edw. A. Ramsay
ATTORNEY.

UNITED STATES PATENT OFFICE.

ARTHUR H. DURAND, OF BALTIMORE, MARYLAND, ASSIGNOR TO JAMES G. DAGRON, OF SAME PLACE.

FIRE-EXTINGUISHER.

SPECIFICATION forming part of Letters Patent No. 470,293, dated March 8, 1892.

Application filed August 14, 1891. Serial No 402,672. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR HYPPOLITE DURAND, a citizen of France, now residing at No. 221 Cortland street, city of Baltimore, State of Maryland, have invented certain new and useful Improvements in Fire-Extinguishing Apparatus, of which the following is a specification.

My invention relates to that class of machines known as "portable chemical fire-extinguishers," in which liquids are held which have the property when discharged of extinguishing fires.

The objects of my improvements are, first, to provide in two separate vessels certain liquids which will not evolve gas or pressure of themselves, but will generate a gas and produce the desired pressure to discharge the contents of the vessel with considerable force and at suitable distances when the two liquids are permitted to come into contact with each other; secondly, to provide a suitable, safe, and convenient mechanism for bringing the two liquids into contact and discharging the fire-extinguishing fluid when desired, and, thirdly, to provide an apparatus that can be safely handled, packed, shipped, and transported. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a section of my extinguisher constructed with a glass cone, showing the interior parts of bulb, yoke, &c., in their proper positions, all ready for use. Fig. 2 is a sectional view of the lower part of the extinguisher, showing the bottom indented by the trigger and the bulb broken. Fig. 3 is an outside view in elevation. Fig. 4 is a transverse section cut through A B, Fig. 4. Fig. 5 is a sectional view of the nozzle. Fig. 6 is a section of the cap of nozzle. Figs. 7 and 8 are views of the valve. Fig. 9 shows a modification of the apparatus.

Similar letters refer to similar parts throughout the several views.

My extinguisher consists of an outer conical case A, constructed of either glass or tin, but with the bottom B, which is separate from the conical barrel, always of tin.

Inside of the case and resting on the bot-

tom a glass bulb C, with an elongated neck, is provided. This bulb stands upright in the case, with the bulb up and the bottom of the neck resting on the bottom of the case. It is held in position by an iron yoke D, which is soldered by its legs to the case and secured by a light wire, fastening the neck around the cross-bar of the yoke, which holds it perpendicular, while allowing it to move upward. A trigger E is provided at the bottom, and a discharge-nozzle F, with proper inlet, placed near the bottom, as shown, with the nozzle projecting into a countersunk aperture communicating with the outside.

The glass bulb C before being placed in the case is dipped in a liquid compound composed of paraffine and beeswax, which, after hardening, provides a soft bearing-surface between the bulb and the iron frame, the latter having also been dipped in the paraffine mixture. The bulb is then placed in the yoke or frame, and then bulb and frame are dipped in the liquid, which, quickly hardening, holds the bulb secure, while at the same time, owing to the interposition of the paraffine, the glass and the iron do not come in intimate contact, which otherwise might cause premature breakage in the case of handling or transportation. The presence of the thin film of paraffine enveloping the upper hemisphere of the bulb also has the effect of slightly retarding the accumulation of pressure when gas is produced by mingling the two liquids, thus producing a progressive force, and so giving the momentary interval required to inject the cork from the mouth of the nozzle. In the preparation of the neck of the bulb containing muriatic acid, I first place a cork H in the opening communicating with the bulb, then another cork I in the bottom of the neck, filling the intermediate space with any ordinary grease. I then place a tin cup filled with hot sealing-wax over the bottom of the neck, and when the bulb is in its proper position, held upright by the iron yoke, the bottom tin cup rests in firm contact with the bottom of the extinguisher. My object in thus fitting the neck being, first, to prevent the escape of the acid until the bulb is broken, and, secondly, to prevent any acid from re-

maining in the neck of the bulb after the first injection of the extinguishing-fluid, and so insure the discharge of all the liquid from the apparatus.

5 In constructing the outer chamber or case to hold the ammonia liquid I provide an inner lip or bearing flange to receive my rubber packing L, molded in the glass below the helix and arranged so that when the cap is
10 screwed up the packing will not be slipped along the threads of the screw. When I make the upper conical chamber of tin, I solder the cap in place, so there is no occasion to use the gasket.

15 The injecting-nozzle F consists of a retort-shaped device having six distinct parts: first, a conical metal tube *a*, with the larger end soldered to the outside of the chamber; secondly, another conical-shaped tube arranged
20 so the small end enters and projects through the tube *a*, stopping short of the outer surface of the chamber and leaving an annular space around the nozzle; thirdly, a small inverted chamber *c*, connected with the pipe
25 or tube *b*, closed on the top and open at the bottom, with an opening in the side communicating with the pipe C. Placed diagonally in chamber C a perforated diaphragm-plate *d* is provided, and a cap *e* is placed over the
30 bottom opening of chamber *c* and soldered in place; but before being soldered a small disk *f* is placed loosely, so as to rest on the flange of *e*, being slightly secured by a projecting tip and inserted in the apparatus provided
35 on the inner surface of the cap *e*. The entire nozzle and chamber is then dipped in the paraffine mixture, which hardens and completely envelops the chamber and tube with a soft thin coating. Before soldering the tube
40 *b* to chamber *c* I insert a cork *h* in the outer mouth or nozzle of the tube *b*.

On the lower cover or cap of the apparatus I place a metal trigger-frame *k*, securely soldered at opposite points on the bottom of the
45 extinguisher, leaving the central space at the bottom clear. A trigger E is held in position by the frame *k* by means of reversed bearings supporting the trunnions which form the fulcrum of the lever or trigger, thus permitting movement when the trigger is pressed
50 by the operator, which is done with considerable ease, and owing to the leverage exerts great force with the application of a small amount of initiatory power.

55 Near the bottom on one side of the apparatus I provide an opening N for the purpose of charging the extinguisher with the ammonia liquid. This opening afterward has a piece of tin tightly soldered over it.

60 Having described my extinguisher in its mechanical details, I now propose to explain the method of charging and operating it. In the first place, I assemble and connect together the different parts of the nozzle. I
65 then dip the nozzle into paraffine mixture and solder it to the side of the case. Next I adjust the trigger-frame and trigger in position.

Then I fill the bulb with pure muriatic acid and close the neck, as before described, fixing the bulb to the yoke with wire, and solder the
70 legs of the yoke in position. After having placed the cap at the bottom of the glass neck in proper contact with the bottom of the case the glass conical chamber is now screwed
75 down on the tin bottom, or in the case of a tin chamber is soldered. I then fill the chamber through the hole in the side with ammonia-water and afterward solder a cover over the opening and the extinguisher is ready
80 for use.

When I desire to extinguish a fire, I simply hold the apparatus erect in one hand and pull the trigger with the other, taking care to direct the nozzle toward the fire. The effect of holding the trigger is to cause the thin tin
85 used in the fabrication of the bottom to yield, and the hammer end of the trigger to press an indenture in the bottom and force the neck of the bulb, which is placed immediately over
90 it, upward, pressing the bulb violently against the yoke, causing its fracture and thus bringing the two liquids in contact and generating a gaseous liquid of considerable pressure. The little disk in the chamber of the nozzle
95 is now forced upward and the mixture injected through the nozzle. The perforated diaphragm-plate prevents the nozzle from being obstructed by small pieces of broken glass.

Referring to Fig. 9, I show a modification of my invention in which the bulb is provided
100 with an upper cylindrical tube or neck *p*, projecting upward to near the top of the glass case. Here it is steadied by sealing-wax *q*. The nozzle is arranged as before, except the movable disk is left off. No trigger is used,
105 as it is intended to force up the thin yielding bottom by a blow from the hand, the effect of which will be to break the bulb or bottle, as before, at *s*. I provide a cylindrical cup to receive and steady the lower neck of the glass
110 bulb at the bottom of the outer case. I have designed this modification of my apparatus especially for the use of firemen and others having strength to indent the bottom with their hands. The other extinguisher can be
115 operated by ladies or children.

Having now particularly described and ascertained the nature of this invention and in what manner the same is to be performed, I would state that I have in setting out the nature of the invention shown certain special
120 arrangements of the several parts of the extinguisher and special modes of arrangements for breaking the inner bulb or bottle. I wish it to be understood, however, that although
125 these forms, modes, and arrangements illustrated may be used with advantage, yet I do not intend to limit my patent to these special things, as it may be carried out in many ways and in connection with different forms of
130 extinguishers without departing from its spirit and scope, and that it is susceptible of many modifications and will necessarily have to be varied in many ways to suit the various pur-

poses and conditions of its application; and
I declare that what I claim in respect of the
herein-described invention is—

1. In fire-extinguishing apparatus, an inner
5 frangible glass bottle or bulb with a long neck
coated with paraffine and having the neck
thereof closed with corks and the intermedi-
ate space filled with grease, the conical dis-
10 charge cone-shaped chamber inclosed in a
cylindrical vessel made in two pieces, the bot-
tom and lower portion of cylinder being con-
structed from one piece of flexible metal se-
cured and jointed by a rubber gasket to the
15 upper cylindrical portion of the vessel, all
substantially as shown and described.

2. In portable chemical fire-extinguishers,
the combination of a nozzle with a chamber,
together with the diaphragm plate and cap,
and paraffine coating, substantially as shown,
20 and for the purposes set forth.

3. In portable fire-extinguishing apparatus,
the combination of a frangible glass bulb in-
closed in a chamber, said bulb having a cylin-
drical neck closed with corks, the neck being
25 filled with grease and the bulb coated with

paraffine, and a supporting metal yoke at-
tached to a tapered cylinder having a pull-
lever secured to its base to indent the same
and cause the bottle to break.

4. The combination, in a chemical portable 30
fire-extinguisher, of a metallic or glass cham-
ber closed at the upper end thereof, with a
separate flexible bottom made in one piece, a
frangible glass bulb with an elongated neck
and concave projection at upper pole of 35
spherical bulb and contained in said chamber,
a metallic yoke with cross guide-bar to hold
the neck of the bottle in position and top bar
fitting in concavity of bulb, a cup containing
paraffine receiving and centering the neck of 40
the bulb over the trigger, and the inverted
discharge-chamber, the said chamber termi-
nating into the small frustum of a cone secured
to the wall of the chamber and through which
the fluid is injected, substantially as described, 45
and for the purpose set forth.

ARTHUR H. DURAND.

Witnesses:

FELIX R. SULLIVAN,
H. HALSEY STRYKER.