No. 635,399. Patented Oct. 24, 1899.

G. G. SCHROEDER.

FIRE EXTINGUISHER.

(Application filed Mar. 14, 1899.)

(No Model.) 2 Sheets—Sheet 1.

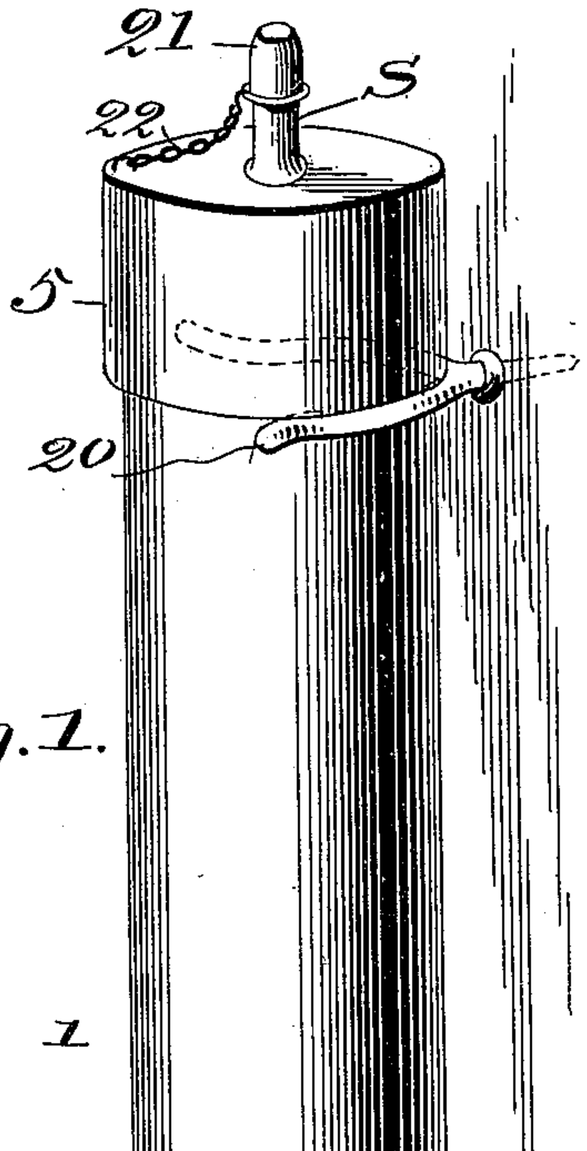

Fig. 1.

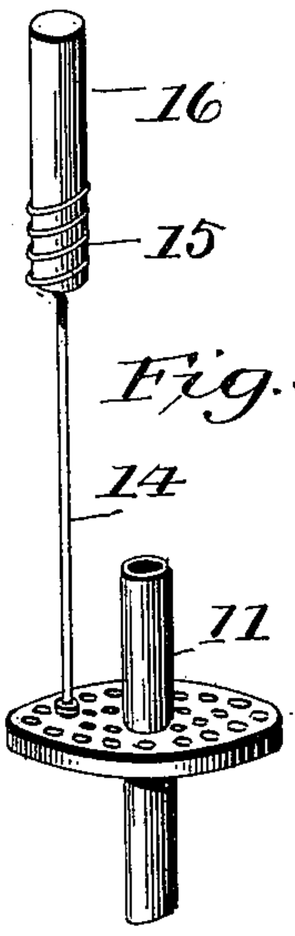

Fig. 3.

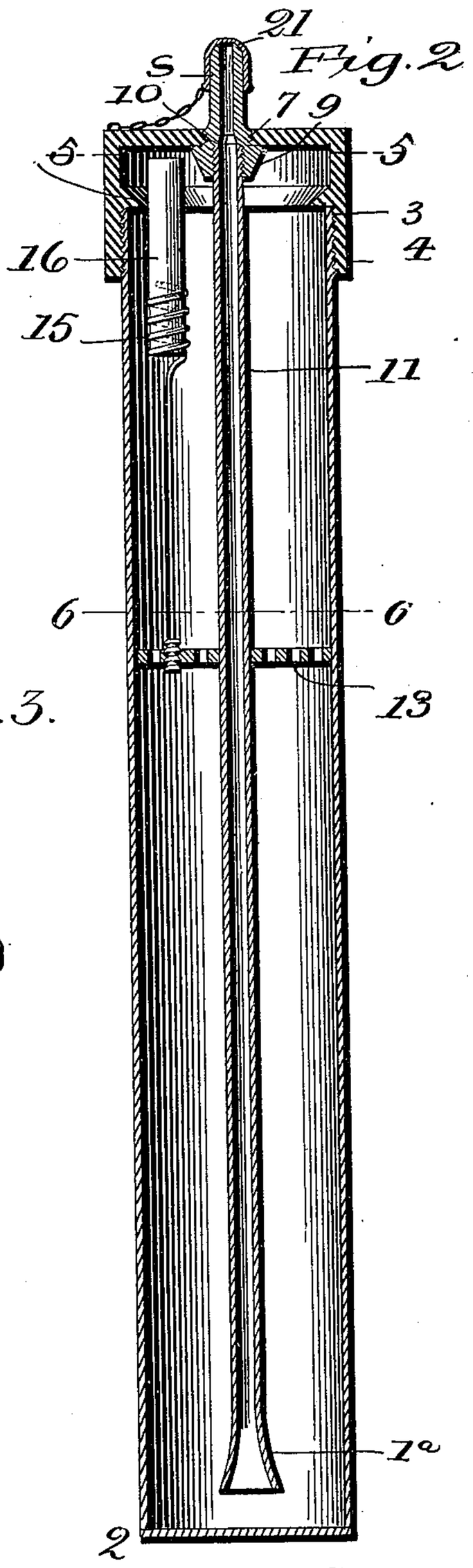

Fig. 2.

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Fig. 4.

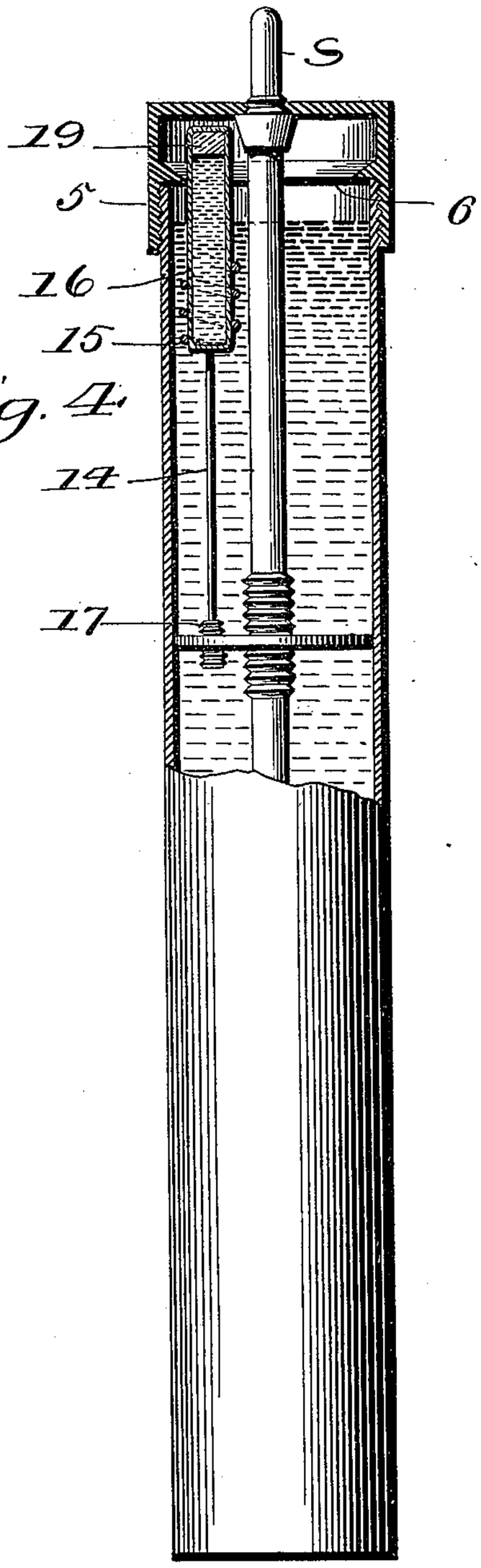


Fig. 5.

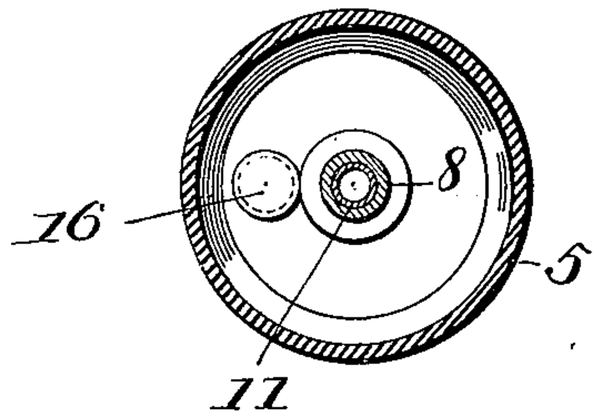


Fig. 6.

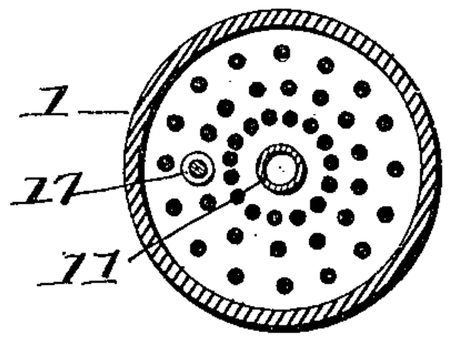
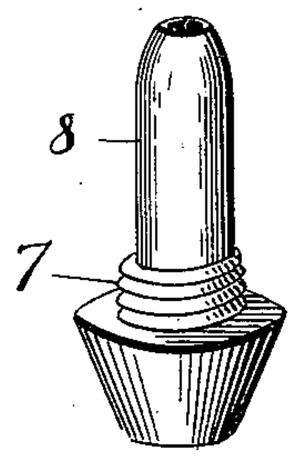


Fig. 7.



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UNITED STATES PATENT OFFICE.

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FIRE-EXTINGUISHER.

SPECIFICATION forming part of Letters Patent No. 635,399, dated October 24, 1899.

Application filed March 14, 1899. Serial No. 709,070. (No model.)

To all whom it may concern:

Be it known that I, GEORGE G. SCHROEDER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Fire-Extinguishers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention has relation to hand chemical fire-extinguishers; and it consists in the novel construction and arrangement of its parts, as hereinafter described.

In the accompanying drawings, Figure 1 is a perspective view of the extinguisher shown hanging against the wall or other suitable surface. Fig. 2 is a longitudinal sectional view of the preferred form of the extinguisher. Fig. 3 is a detail perspective view of the diaphragm used in the extinguisher and the vessel supported thereon containing the sulfuric acid. Fig. 4 is an elevation, partly in section, of a modified form of the extinguisher. Fig. 5 is a transverse sectional view of the extinguisher, cut on the line 5 5 of Fig. 2. Fig. 6 is a transverse sectional view of the extinguisher, cut on the line 6 6 of Fig. 2. Fig. 7 is a perspective view of the nipple.

The object of the invention is to construct a chemical fire-extinguisher with a vibrating support for an acid-containing bottle, said vibrating support being fixed at its lower end to a substantially stationary point and adapted to hold at its upper end the acid-containing vessel. The specific means for holding said vessel, as shown in the drawings, is to provide the upper end of the vibrating support with a coil, the vessel being located and held in said coil.

The further object of the invention is to provide a shifting diaphragm, said diaphragm adapted to be moved perpendicularly and being interposed between the liquid-outlet of the extinguisher and the vessel containing the acid, said diaphragm supporting the vessel. At the point where the support for the vessel comes in contact with the said diaphragm a means for perpendicularly adjusting the position of the acid-containing vessel is provided.

The further object of the invention is to provide an acid-containing vessel permanently secured to a vibrating support, said vessel adapted to be brought in contact with a sharpened annular flange as the extinguisher is given a knock or jar. Thus the vessel is broken, and its contents, mixing with the fluid contained within the extinguisher, generates a gas under pressure, which expels the compound from the extinguisher. The sharpened annular protrusion is located in the interior of the cap of the extinguisher, the lower side of said protrusion being adapted to come in close contact with the upper edge of the tube forming the body portion of the extinguisher. Thus a tight joint is made between the cap and the tube.

The further object of the invention is to provide the acid-containing vessel with a weight, said weight being located in the interior of the vessel and above the sharpened annular protrusion. The vessel being secured at its lower end to a vibrating support and adapted to come in contact with the sharpened protrusion at an intermediate point, the weight facilitates in the breakage of the vessel.

In addition to the objects set forth it is my aim to produce a chemical fire-extinguisher of simple and inexpensive construction, one which can be easily manipulated and which will effectively serve its intended purpose.

My extinguisher is provided with a means for obtaining a maximum force in expelling the liquid when but a minimum pressure is obtained. This is done by reducing the volume of the liquid as it passes from the extinguisher by reason of the flared end of the inner tube, which exposes a greater surface to the inner pressure and concentrates its effect upon the diminished outlet.

In my construction I further aim to produce a fire-extinguisher which is free from the dangers of explosion and which can be used safely in the hands of unskilled persons and persons unaccustomed to the handling of such fire apparatus.

The tube 1 is closed at its lower end 2 and is open at the upper end 3. The external surface of the upper end is provided with a thread 4. Said tube is adapted to hold water mixed with proper proportions of bicarbonate

of soda, or other chemicals may be used, if preferred. The cap 5 is provided with the internal thread, which is adapted to engage the thread 4. Said cap in its interior is provided with a shoulder 6, which when the cap is in its place on the tube is adapted to come in close contact with the upper end of the tube, thereby forming a tight joint without the aid of washers or packing. The upper corner of said shoulder is beveled, as shown in Figs. 2 and 4, and the inner edge of the shoulder is thereby sharpened. The center of the cap 5 is provided with a perforation 7, said perforation being internally threaded. The nipple 8 is located in said perforation, said nipple being provided with a thread adapted to engage the thread in the perforation 7. Said nipple is provided with an annular shoulder 9, which is adapted to come in close contact with the under side of the top of the cap, and thereby make a tight joint without the aid of washers or packing. Said nipple is longitudinally perforated, and at the point 10 the said perforation is reduced in its diameter in order that when the fluid reaches said point it is reduced and is expelled from the end of the nipple with much greater force. The upper end of the inner tube 11 is threaded and is adapted to engage an internal thread in the shoulder 9 of the nipple 8. Said inner tube 11 extends from the cap to within a short distance of the lower end 2 of the tube 1. The lower end of the inner tube 11 is preferably flared, as shown at 12 in Fig. 2. The object of flaring the lower end of the tube is to reduce the liquid as it passes through the tube, and thereby impart to it much greater force. Thus it will be seen that as the liquid passes through the tube 11 and the nipple 8 it is reduced at two points—viz., 12 and 10.

The diaphragm 13 is mounted on the tube 11. Said diaphragm is perforated and fits loosely in the tube 1. The perforations in the diaphragm 13 are smaller than the perforations through the nipple 8, the object of which will be hereinafter explained. The diaphragm 13 supports the spring-wire 14. The upper end of said wire is coiled, as at 15, and within said coil is located the lower end of the glass vessel 16. Said vessel 16 contains sulfuric acid or other gas-producing liquid. The upper end of the vessel 16 passes beyond the sharp edge of the shoulder 6, and there is sufficient space left on each side of the vessel 16 to permit it to have sufficient play to facilitate its breakage.

The lower end of the wire 14 is secured in a threaded plug 17, and said plug in turn is located in a threaded perforation in the diaphragm 13. Thus by revolving the plug 17 and its attachments the perpendicular position of the vessel 16 may be regulated—that is, said vessel may be brought nearer the top of the cap 5 or farther therefrom, as desired. As an additional adjusting means the inner tube 11 may be provided with a threaded collar 18, said collar being made fast to the tube. Thus it will be seen that by revolving the diaphragm on the collar the perpendicular position of the diaphragm may be regulated, and thus the position of the vessel 16 may be varied. The object of providing these means for varying the position of the vessel 16 is that thereby the vessel can be put in the proper position to facilitate its breakage at the proper time. The further object of providing these means is that the diaphragm and its attachments may be shifted in order to admit vessels of different lengths.

To further facilitate the breakage of the vessel 16, its upper end may be loaded, as shown at 19 in Fig. 4. When the vessel is in position, the load will be above the shoulder 6. Said load is located, preferably, within the vessel, and it may be lead or any other substance which is not affected by sulfuric acid or the contents of the vessel. Said vessel 16 is hermetically sealed and its contents cannot mingle with the chemicals in the tube 1 until the vessel 16 is broken.

The diaphragm 13 is interposed between the vessel 16 and the lower end of the tube 11. Thus when the vessel 16 is broken the small perforations in the diaphragm 13 will prevent the particles of glass from lodging in the tube 11 and in the perforations of the nipple 8. As the perforations in the diaphragm 13 are smaller than the perforations in the nipple 8, any small particles of glass that pass through the perforations in the diaphragm 13 will readily pass through the perforations in the nipple 8 without doing any harm to any of the parts of the extinguisher.

To hang the extinguisher to the wall, I provide a bifurcated hook 20, as shown in Fig. 1. Said hook is adapted to be screwed into the wall, and when the extinguisher is hung thereon the lower edge of the cap 5 rests on said hook, whereby the extinguisher is supported.

In operation the extinguisher is removed from the hook 20 and the cap 5 is given a sharp tap against any convenient object. This tap will bring the vessel 16 forcibly against the sharp edge of the shoulder 6, and the vessel is thus broken, its contents are thereby liberated, and in mingling with the contents of the tube 1 a gas is generated under heavy pressure. This pressure forces the fluid contents of the tube 1 through the tube 11 and out at the end of the nipple 8, from whence they are directed at the fire. In directing the stream at the fire great care should be taken to throw it as near the base of the fire as possible, as in practice it has been demonstrated that a fire can be extinguished quicker by getting the chemicals under it than by throwing them on top. Thus it will be seen I provide a hand chemical fire-extinguisher wherein the acid-containing vessel may be broken without perforating the extinguisher to admit objects to break said vessel, and by generating a gas at the opposite

end of the extinguisher from the end 12 of the inner tube the full liquid contents of the tube 1 will be expelled and none of the pressure of the gas generated can escape until the liquid contents of the tube 1 are forced out.

The outer end of the nipple 8 is preferably provided with a cap 21, as shown in Figs. 1 and 2. Said cap is adapted to slip over the end of the nipple and is connected by a chain or other flexible connection with the said cap. The chain or connection 22 is of sufficient length to permit the cap to blow off when the pressure is generated within the extinguisher, and the said chain 22 retains the cap to the extinguisher. Said chain, however, is not of sufficient length to permit the cap to fly back and strike the hand of the operator. Any other suitable cap may be employed with or without the chain, as desired.

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

1. A fire-extinguisher having a suitable fluid-outlet, a vibrating support located within the extinguisher, a breakable vessel attached to said vibrating support, said vessel containing a gas-producing liquid, a protrusion located in the path of the said breakable vessel while attached to the vibrating support, said vessel adapted to be brought against the said protrusion and broken by a knock or jar.

2. A fire-extinguisher having a suitable fluid-outlet, a breakable vessel located in the said extinguisher, said vessel containing a gas-producing liquid, a sharpened annular protrusion located within the said extinguisher and surrounding the breakable vessel, a vibrating support permanently connected to said vessel, said vessel adapted to be broken by being brought in contact with said protrusion by a knock or jar.

3. A fire-extinguisher having a suitable fluid-outlet, a breakable vessel containing a gas-producing liquid, a vibrating support permanently connected to said vessel, a weight located in the interior of the vessel, said weight being other than that of the vessel or liquid, said vessel adapted to be broken by knock or jar.

4. A fire-extinguisher having a suitable fluid-outlet, a breakable vessel containing a gas-producing liquid, said vessel being heavier at its free end, a vibrating support holding said vessel at its lighter end, a protrusion located within the extinguisher, said vessel being adapted to be broken by a knock or jar by being brought in contact with the protrusion at an intermediate point.

5. A fire-extinguisher having a suitable fluid-outlet, a breakable vessel containing a gas-producing fluid, a spring-support holding said vessel, a sharpened protrusion located within the extinguisher, said vessel adapted to be broken by said protrusion by a knock or jar.

6. A fire-extinguisher having a suitable fluid-outlet, a breakable vessel located therein and containing a gas-producing liquid, a spring-support attached to the liquid-outlet and holding said vessel, a suitable device for perpendicularly adjusting said vessel adapted to be broken by knock or jar.

7. A fire-extinguisher having a suitable fluid-outlet, a breakable vessel located therein containing a gas-producing liquid, a spring-support attached to the liquid-outlet and holding said vessel, a suitable device for perpendicularly adjusting said support and vessel, said vessel adapted to be broken by knock or jar.

8. A fire-extinguisher having a suitable fluid-outlet, a breakable vessel located within the extinguisher and containing a gas-producing liquid, said vessel being adapted to be broken by knock or jar: a perforated diaphragm located on the liquid-outlet between said vessel and the end of the outlet, said diaphragm supporting the vessel containing the gas-producing liquid, a means for perpendicularly adjusting the position of the diaphragm.

9. A fire-extinguisher having a suitable liquid-outlet, a breakable vessel containing a gas-producing liquid, a device supporting said vessel, said device consisting of a spring-wire supported at its lower end, the upper end of said wire being coiled, the coil adapted to receive the vessel, said vessel adapted to be broken by knock or jar.

10. A fire-extinguisher consisting of a liquid-containing tube, the vessel containing the gas-producing liquid located within the extinguisher, a cap located at the end of the tube and having a shoulder adapted to engage the upper end of the tube, said shoulder being sharpened and adapted to break the vessel containing the gas-producing liquid, when brought in contact therewith.

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

GEORGE G. SCHROEDER.

Witnesses:

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