(No Model.) 2 Sheets—Sheet 1.

B. S. BROWN.

FIRE EXTINGUISHER.

No. 589,202. Patented Aug. 31, 1897.

Fig. 1.

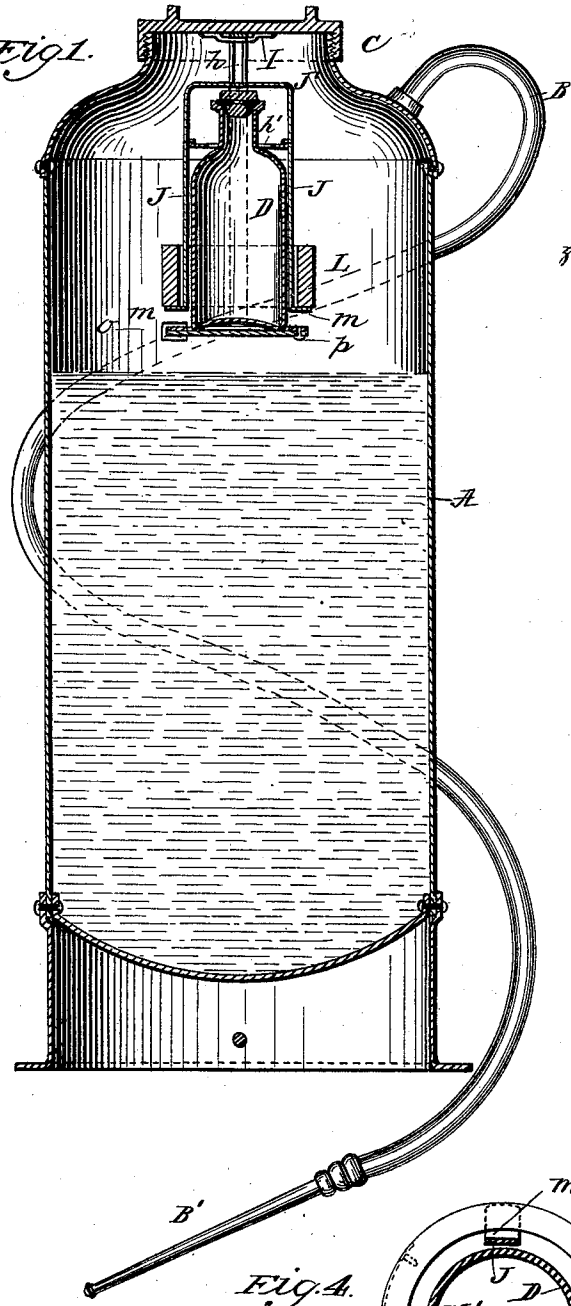


Fig. 2.

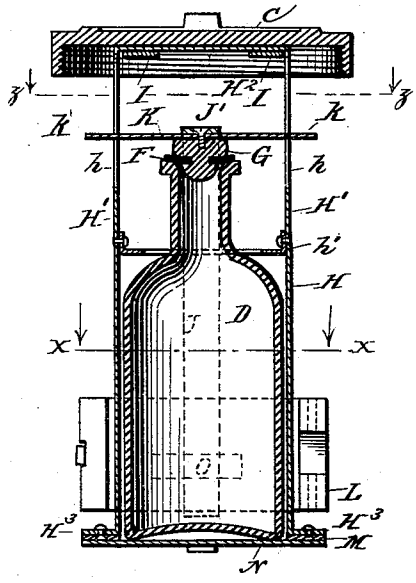


Fig. 3.

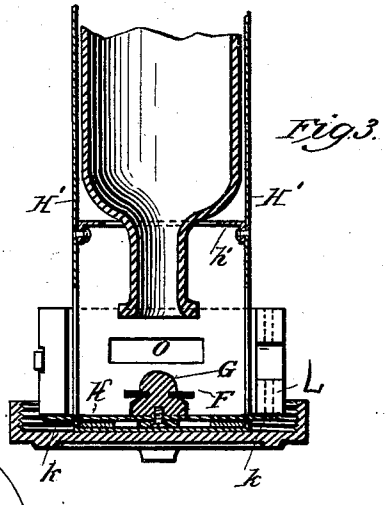
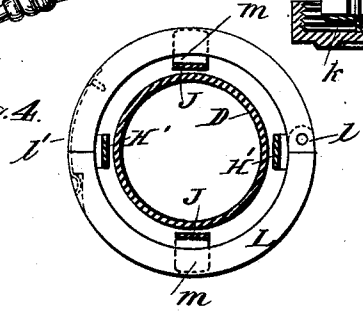


Fig. 4.



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(No Model.) 2 Sheets—Sheet 2.

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Fig. 5.

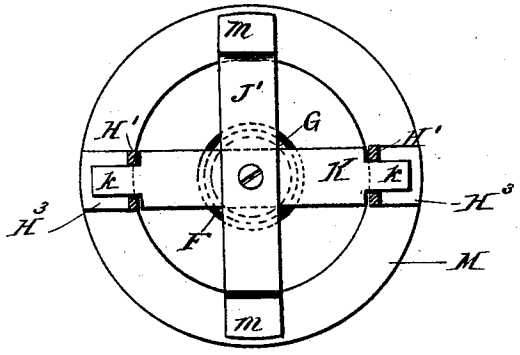


Fig. 6.

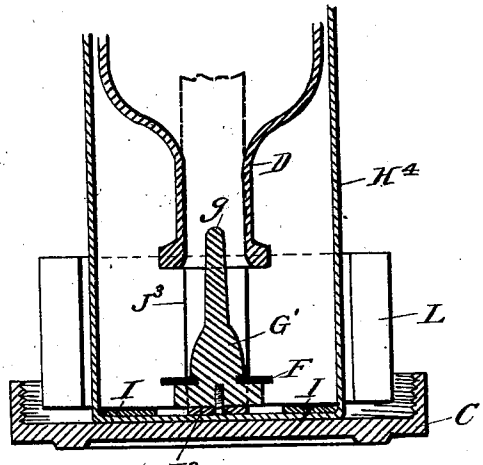
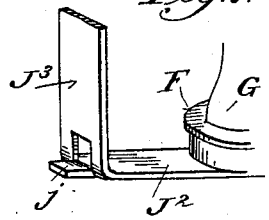


Fig. 7.



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UNITED STATES PATENT OFFICE.

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FIRE-EXTINGUISHER.

SPECIFICATION forming part of Letters Patent No. 589,202, dated August 31, 1897.

Application filed May 31, 1895. Serial No. 551,074. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN S. BROWN, a citizen of the United States, residing in the city of New York, in the county and State of New York, have invented certain new and useful Improvements in Fire-Extinguishers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification.

My invention relates to that class of fire-extinguishers which may be carried from place to place for use and in which liquids and chemicals are used, which are designed to be left separated when the extinguisher is not in use and to be united to perform their proper functions when it becomes necessary to employ the extinguisher to suppress a fire. Usually a strong soda solution is employed, which is kept in the tank or receptacle constituting the extinguisher, and in the same tank a vessel containing strong acid is disposed, and the apparatus is rendered effective for use by mixing the acid and soda solution and thereby generating a gas by means of which the contents of the extinguisher are forced out through a hose and impelled upon the fire. In these devices great difficulties have been met in properly arranging a vessel containing the acid within the tank or receptacle. It is very desirable that this vessel should be made of glass, that it should be sealed when the extinguisher is not in use, that its contents should be easily and certainly released when it is desired to use the extinguisher, and that it should be of such structure as to be readily and conveniently replaced in case of breakage.

The object of my invention is an acid holding and discharging device which will safely contain the acid, in which neither the vessel nor any part of it is to be broken in order to discharge the acid, which is so constructed that the sealing device will certainly be removed from the orifice of the acid-holding vessel, and in which an ordinary bottle is to employed, which can be readily replaced at any drug-store in case it should be broken and the extinguisher at once recharged.

To enable others skilled in the art to make and use the same, I will now describe its construction and operation.

In the drawings, Figure 1 represents a fire-extinguisher, partly in section, containing my improved acid-bottle and cage. Fig. 2 is an enlarged view of the extinguisher-cap with the acid-bottle contained in its cage suspended thereto, partly in section. Fig. 3 shows the acid-bottle and certain parts reversed as they appear when the acid is to be discharged. Fig. 4 is a view from the line $x\ x$ of Fig. 2, looking downward. Fig. 5 is a view from the line $z\ z$ of Fig. 2, looking downward, the acid-bottle and weight removed to show the parts more clearly. Fig. 6 illustrates an example of my invention in which the stopple G′ is prolonged to form a guide into the orifice of the acid-bottle. Fig. 7 is a perspective view of parts of the form of device shown in Fig. 6. Figs. 5, 6, and 7 are drawn to a scale larger than the other figures.

Similar letters of reference indicate like parts in all the drawings.

A represents one of the ordinary fire-extinguishing vessels or tanks, which is to be provided with a suitable hose B, connected to discharge the contents and provided with a nozzle B′. The extinguishing vessel has a screw-threaded neck adapted to receive a closing-cap C, to which the acid vessel, with its accompanying devices of my invention, may be secured in any convenient manner.

The acid vessel readily adapted for use in my invention may consist of an ordinary round bottle D—say a four, six, or eight ounce bottle—such as is usually in stock at drug stores.

In the example of my invention figured in the drawings the acid vessel D is shown disposed in a cage consisting of a bar H, which is bent to have a leg H′ H′ on each side of the bottle D and a cross portion H^2 at the top, connecting the two legs H′ H′. The cross part at the top may be soldered or otherwise secured to the cap C. In Figs. 1 and 2 the same is shown attached to the cap C by two auxiliary strips I I, which pass around it, and being soldered to the cap C hold it firmly in place there. At the lower ends of the legs H′ H′ feet H^3 H^3 are formed, by means of which the legs H′ H′ are firmly secured to a

ring M, which is made of a size to allow the the bottle D to pass through it from beneath until it reaches a point where its shoulder impinges against a ring h', which has an opening of such size as to prevent the further passage upward of the bottle D. This ring h' is secured to the legs H' H' in any convenient manner. A disk N is attached at a suitable point to the ring M by a pivot p, as shown in Fig. 1, by means of which the disk N can be turned out of the way of the opening in the ring M to permit the bottle to be passed through the ring M, between the legs H' H', and against the ring h', and when the bottle has been passed into place the disk is turned upon its pivot p to close the opening and support the bottle in position, a suitable clamp O, Fig. 1, supporting the disk N at a point opposite to the pin p.

For sealing the said bottle D a stopple G is provided. This consists of a portion which projects into the orifice of the bottle, a reduced portion which is adapted to take and retain a rubber disk F, having a hole in the center, and an enlarged portion adapted to rest on the rubber disk and hold it down upon the neck of the bottle and seal the same, as clearly shown in Figs. 1 and 2. In order to guide the stopple G upon and into the neck of the bottle, a guide portion is provided, one form of which may conveniently consist of a piece, as K, attached in any convenient manner to the top of the stopple G. This guide-piece has projections $k\,k$, which move in slots $h\,h$ of the legs H' H' and always hold the stopple G in line with the neck of the bottle D.

For the purpose of holding the stopple and rubber disk to the neck of the bottle to seal the same I have disposed a suitable device which performs that office by gravity. This consists of a piece forming a pair of legs J J and an upper connection J', to which the guide K and stopple G are connected. At the end of the legs J J the feet $m\,m$ are provided, and the arrangement of the parts is such that when the stopple is in the bottle the guide K passes between the legs H' H', and the projections $k\,k$ of the guide pass through and beyond the slots $h\,h$, and over the stopple and guide-piece K the part J' crosses at right angles to the upper part H^2, so that the bottle D is disposed between the four legs H' H' and J J, as clearly shown in Fig. 4.

To weigh down the stopple upon the disk F, a weight L is provided, which may be in the form of a metal ring consisting of two parts, which can be hinged together, as shown at l in Fig. 4, and opened to be clasped around the legs H' H' J J, and closed around them and held together by a suitable spring l', Fig. 4. This weight rests upon the feet $m\,m$ of the legs J J, as clearly shown in Fig. 4, whereby the weight is suspended upon the stopple G and holds the same against the rubber disk F by gravity, and thereby the bottle is sealed, which prevents weakening of the acid by taking up moisture from the water in the extinguisher-tank.

As these extinguishers are frequently placed in position for a long time without use, by reason of which the working parts are liable to corrode and stick together, it is necessary to provide efficient means for unclosing the bottle when the acid is to be mixed with the solution in the tank. The liability of a rubber seal to stick to the neck of a bottle when held in place for any length of time is well known, and until my invention, described herein, it has not been practicable to use such a sealing device, although no better device is known for that purpose. For this purpose the weight L is utilized to perform a percussive office, the fire-extinguisher is reversed, which causes the parts to assume the position shown in Fig. 3, the weight L slides down the legs H' H' J J, striking the ends $k\,k$ of the guide K in its downward path, and thereby the stopple G and disk F are forcibly driven away from the orifice of the bottle.

Another example of my invention is shown in the drawings in Figs. 6 and 7. In this example of my invention legs H^4, corresponding to the legs H', but without the slot h, are provided and the guide K is dispensed with. A guide for the stopple G' is formed by prolonging the same with a stem, as g, which remains within the orifice of the bottle when the same is reversed. The weight-carrying part of this example of my invention consists of legs J^3, corresponding to the legs J and having a cross-piece J^3 at the top corresponding to the cross-piece J', but near the upper part of the weight-carrying legs projections j are provided, against which the weight L strikes when the bottle is reversed. This projection j may be readily made by stamping out a part of each leg J^3 and turning it outward, as shown in Fig. 7, or a screw or other form of detent may be attached to each of the legs J^3 in the path of the weight to receive the impact of the weight when the bottle is reversed, as shown in Fig. 6.

The weight may have openings $o\,o$ formed through it, which will increase the space for the commingling of the acid and solution, if desired.

The metallic parts may be formed of aluminium, if desired, which is a metal not liable to corrode, although I have found that copper will answer the purpose very well. The weight L may be cheaply cast in iron or lead, and the stopple can also be made of lead. The sealing-disk F may be conveniently made of rubber.

The operation of the device is as follows: The cap C of the extinguisher is taken off, and therewith the cage and acid-bottle. The liquid solution is poured into the cylinder or tank. The bottom N of the cage is swung away and the acid-bottle D taken out and filled to near the top. It is then inserted into the cage through the ring M, and the bottom N is adjusted to hold it in place. The cap

C, with its cage, is then screwed back onto the extinguisher, and the same is put aside for use. When required for use in case of fire, all that is necessary to be done is to reverse the extinguisher. This causes the weight L to slide down the cage, striking the projections in its path connected with the stopple G, thereby forcing the stopple from the mouth of the bottle, allowing the acid to escape and perform its functions. When it is desired to replenish the contents, the bottle D is taken out of the cage through the bottom and replenished with acid. Liquid solution is again put into the tank, acid into the bottle, which is put into its cage, the bottom closed, the cap C fastened into position, and the device is again ready for use. It will be noted, furthermore, that as the stopple is always in line with the opening of the bottle the discharge of the acid can readily be stopped, if desired, by simply reversing the position of the extinguisher, when the weight will act to draw down the stopple and sealing device upon the orifice of the bottle.

It will be seen from the description that there is no part of this device which is designed to be broken or destroyed by the ordinary use for which it is intended; that in using it there are no pieces of glass or other broken material to work into the hose or hose-opening and obstruct free passage therein; that the only part which can be broken is a common round bottle, which if broken by accident can be replaced at any drug-store and the device rendered as effective as it was before. Where a peculiar seal or vessel or bottle is designed to be broken or is broken by accident, it often happens that it cannot be replaced at once, but must be supplied from a distance, or it may not be practicable to replace at all if the particular manufacturer has changed his patterns or gone out of business.

It will be evident that my invention can be carried out by the use of other forms of weights, projections, cages, and parts coacting to suspend a weight upon a stopple provided with a sealing part and adjusting the weight to hold the stopple in place by gravity and then to release the stopple percussively by striking upon some part connected with it, when the position of the acid-bottle is reversed, and therefore I do not limit myself to the forms of the parts shown; but,

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

1. A device for retaining acid in a fire-extinguisher, consisting of a suitable bottle, in combination with a sealing part adapted to be held to the orifice of said bottle, and a weight adapted to hold the sealing part to the orifice by gravity and force the same from such orifice by percussion, substantially as described and shown.

2. A fire-extinguisher provided with a suitable tank to hold a liquid solution and an acid vessel disposed in such tank, and supported in a suitable cage therein; such acid vessel provided with a closing device adapted to be held in place upon its orifice, in combination with a suitable weight arranged to hold the closing device upon such orifice by gravity and to force the same away from such orifice by percussion, substantially as described and shown.

3. An acid vessel for fire-extinguishers provided with a stopple, G, having an elastic sealing portion as the disk, F, adapted to be held to the orifice of such vessel by gravity, in combination with a weight adapted to release such stopple by percussion, substantially as described and shown.

4. A support for an acid-bottle in fire-extinguishers, consisting of a cap, C, and a suitable cage having legs, H′, H′, ring, h', ring, M, and bottom, N, in combination with a weight adapted to move along such support between the cap C and ring M, substantially as described and shown.

5. A support for an acid-bottle in a fire-extinguisher consisting of a cage formed by the legs H′, H′, having slots h, h, cross-piece H^2, ring h', ring M, and bottom N, in combination with a stopple adapted to seal the orifice of said vessel, and provided with a guide K, having ends k, k, projecting through the slots h, h, substantially as described and shown.

6. A support for an acid-bottle in a fire-extingusher, consisting of a suitable cage to hold the bottle in place, in combination with a stopple having a sealing device adapted to seal such bottle, and a weight adapted to move upon such cage, and to hold the sealing device down upon the orifice of the bottle by gravity when in one position, and to strike the sealing device away from such orifice when the bottle is reversed, substantially as described and shown.

7. A support for an acid-bottle in a fire-extinguisher, consisting of a suitable cage to hold the bottle in place, a stopple and elastic portion F, adapted to seal the orifice of said bottle, a guide for said stopple adapted to keep the same in line with such orifice, a device adapted to support a weight upon such stopple, as the parts J, J, J′, and feet m, m, in combination with a weight, as L, adapted to engage said weight-supporting device and retain the sealing device in place upon the neck of the bottle when the bottle-neck is raised, and to slide down upon the parts J, J, and force the sealing device from the orifice when the position of the bottle is reversed, substantially as described and shown.

8. A support for an acid-bottle in a fire-extinguisher, consisting of a suitable cage to hold the bottle in place, a stopple provided with a sealing portion as G adapted to close the orifice of said bottle, a weight adapted to move from one part of said cage to another, in combination with suitable parts adjusted to said stopple, and projecting into the path of such weight, such weight adjusted to act

upon one set of such projections to hold the stopple upon the orifice by gravity, and to act upon another set of such projections by percussion to drive the stopple away from such orifice when the cage is reversed, substantially as described and shown.

9. A support for an acid-bottle in a fire-extinguisher, consisting of a cage formed of the legs H′, H′, ring *h′*, ring M, bottom N, legs J, J, and guide K, in combination with a suitable stopple as G, provided with a sealing portion, as F, and a weight, as L, adapted to rest upon the feet *m*, *m*, to hold the stopple in place when he bottle stands upright, and to move upon the cage and against the projections *k*, *k*, to force the stopple away from the bottle when the same is reversed, substantially as described and shown.

10. The combination, in a chemical fire-extinguisher in which the chemicals are combined by inverting the tank, of a suitable cage designed to receive a bottle and fixed to the top of the receptacle, a stopper for the bottle held in alinement with the mouth of the bottle by said cage, a frame connected with the bottle-stopper and longitudinally movable relatively to the cage, and a weight connected with said frame.

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