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A. C. BATTELLE.

FIRE EXTINGUISHER.

APPLICATION FILED APR. 10, 1903.

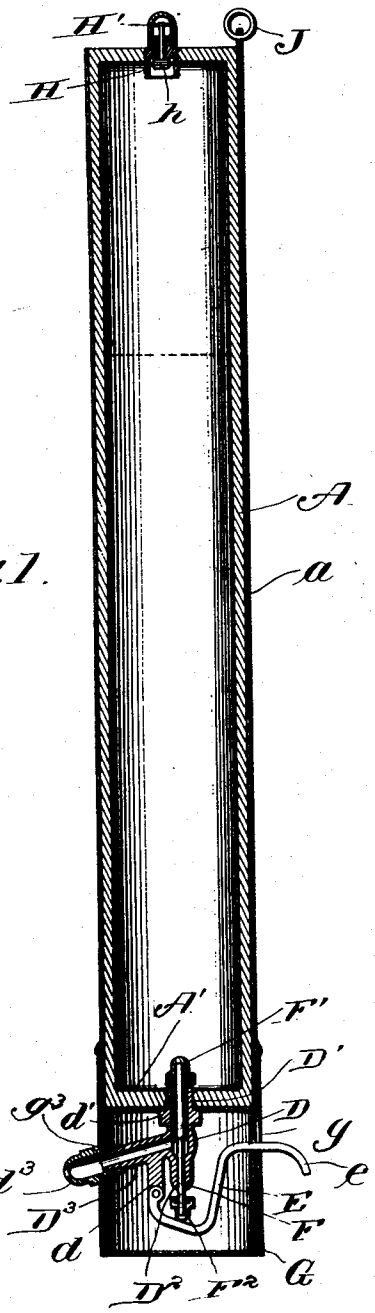


Fig. 1.

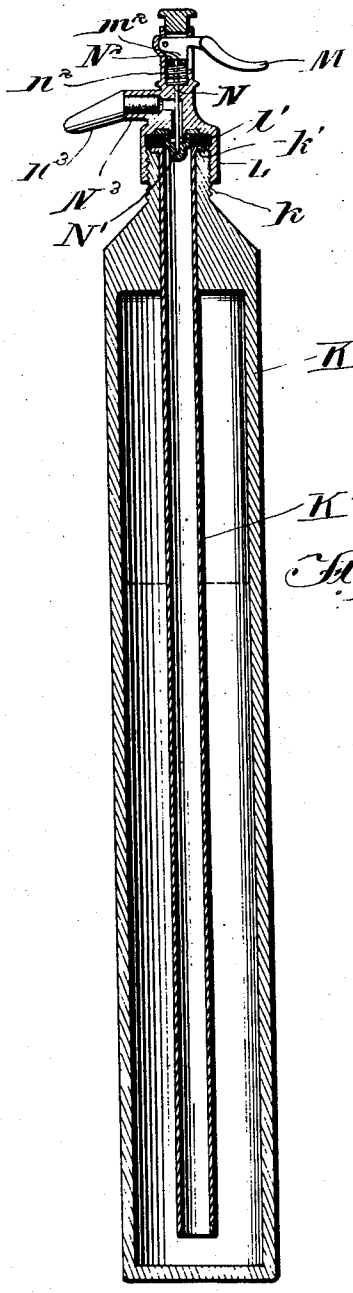


Fig. 2.

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UNITED STATES PATENT OFFICE.

ALBERT C. BATTELLE, OF CHICAGO, ILLINOIS.

FIRE-EXTINGUISHER.

SPECIFICATION forming part of Letters Patent No. 778,439, dated December 27, 1904.

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To all whom it may concern:

Be it known that I, ALBERT C. BATTELLE, a citizen of the United States, residing at Chicago, county of Cook, State of Illinois, have invented a certain new and useful Improvement in Fire-Extinguishers; and I 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 pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates generally to fire-extinguishing apparatus, and more particularly to fire-extinguishers of the type in which a powdered chemical is discharged upon a fire.

The primary object of my invention is to provide a fire-extinguisher in which a powdered fire-extinguishing chemical is confined under pressure and may be readily discharged upon a fire and which will be simple in construction, comparatively inexpensive in manufacture, and efficient in operation.

My invention, generally described, consists in a vessel which contains a powdered chemical directly subjected to the pressure of air or gas confined in the vessel and means for controlling a discharge-opening leading from the interior to the exterior of the vessel, through which the powdered chemical is expelled by the force of the air or gas confined under pressure in the vessel.

My invention will be more fully described hereinafter with reference to the accompanying drawings, in which the same is illustrated as embodied in two convenient and practical forms, and in which—

Figure 1 is a vertical central section through one specific form of the invention, and Fig. 2 a similar view of a modified form of the invention.

Referring particularly to Fig. 1, A indicates a vessel, preferably of tubular form, with closed ends. The vessel may be made of any material capable of withstanding an interior pressure of the requisite degree. *a* indicates an ornamental sleeve surrounding the vessel. Extending through an orifice in the lower end A′ of the vessel is a valve-casing D, with the interior of which communicates a discharge-tube D^3. An exteriorly-screw-threaded end D′ engages the surrounding surface of the orifice in the end of the vessel, the shoulder *d*′ serving to limit the inward movement of the screw-threaded end D′. A valve-stem F extends through the valve-casing D and supports at the end thereof which extends within the vessel a valve F′, adapted to seat against the end D′ of the valve-casing. The opposite end of the valve-stem extends through the valve-casing and carries a valve F^2, adapted to engage a seat D^2 on the end of the valve-casing when the rod is reciprocated toward the cylinder to unseat the valve F′. A lever E is fulcrumed at one end upon a lug *d* on the valve-casing and engages the valve F^2. The end *e* of the lever projects through a slot *g* in a cap G, which engages the exterior surface at the lower end of the vessel and incloses the valve mechanism. A nozzle d^3 is supported upon the end of the discharge-tube D^3 and extends through an opening g^3 in the cap G. An inwardly-opening valve *h*, located within the casing H, is shown at the upper end of the vessel, the casing extending through and supported in the end wall thereof. H′ indicates a cap supported upon the exterior end of the valve-casing H to protect the valve *h*. Any suitable means may be provided for supporting the vessel in the position shown in Fig. 1, such, for instance, as a ring J. In order to charge the vessel ready for use, the powdered fire-extinguishing chemical, which may consist in any suitable or well-known composition—such, for instance, as bicarbonate of soda—is inserted in the vessel. The powdered chemical may be introduced by removing the cap G and unscrewing the valve-casing D and then inverting the vessel from the position shown in Fig. 1, so that the powder may be inserted through the opening in the end A′ of the vessel. A sufficient quantity of powder is inserted in the vessel to fill approximately two-thirds of the capacity thereof. The valve-casing is then screwed into the end of the vessel and the joint hermetically sealed, after which the vessel is charged with air or gas to the requisite degree of pressure. The air or gas may be charged by coupling to the screw-threaded end of the discharge-tube D^3

a conduit communicating with an air-compressor, a storage-tank of compressed air, or with any other source of compressed air or gas. The vessel may also be charged with the air or gas by coupling a conduit to the exterior screw-threaded portion of the valve-casing H of the valve *h*. If the vessel is charged with the fluid-pressure through the valve *h*, the latter is then hermetically sealed by solder or otherwise. After the powdered chemical has been placed in the vessel and the latter charged with compressed air or gas the cap G is inserted over the valve mechanism, so as to entirely conceal the latter except the projecting end *e* of the valve-lever and the nozzle d^3, which is screwed onto the end of the discharge-tube D^3 and projects through the opening g^3 after the cap has been placed around the valve mechanism and in engagement with the end of the vessel. The charged vessel is then ready for use and is preferably hung from a support by means of the ring J or a similar device. When a fire occurs and it is desired to use the extinguisher, it is removed from its support and the nozzle pointed toward the flames, after which the lever is pressed upwardly, so as to unseat the valve F', thereby permitting the powdered chemical to be discharged through the nozzle d^3. By inclosing the valve mechanism within the cap no confusion can arise as to the method of operating the extinguisher, as the end *e* of the lever projects through the slot *g* and engages the lower end thereof and can consequently only be moved upwardly—that is, in a direction to unseat the valve F'. It is obvious that when the compressed air or gas is being introduced in the vessel the lever of the valve is moved upwardly, thereby unseating the valve F' and seating the valve F^2 against the seat D^2, thereby preventing the escape of the air or gas under pressure and insuring its passage into the vessel.

In Fig. 2 I have illustrated a modified embodiment of my invention in which the vessel is adapted to discharge the powdered chemical when it is held in such a position that the valve mechanism is at the upper end thereof. The discharge of the powdered chemical is effected by means of a tube K', extending downwardly within the vessel K to a point near the bottom thereof, it being retained therein by means of a flange k' at its upper end held between the end *k* and a washer *l'*. The valve-casing L terminates in an interiorly-screw-threaded sleeve, which engages the exterior screw-threads on the upper end *k* of the vessel. A valve N' within the upper end of the tube K' seats outwardly, and thereby closes the passage-way through the tube K' to the discharge-tube N^3. The valve N' is normally retained against its seat not only by the pressure in the vessel, but also by the spring n^2, which surrounds the upper end of the valve-rod N and engages a washer N^2 thereon. A lever M is provided for unseating the valve N' through the medium of a cam m^2, which engages the washer N^2 to depress the latter and thereby compress the spring n^2. A downwardly-inclined nozzle n^3 is preferably secured to the discharge-tube N^3.

In the embodiment of my invention shown in Fig 2 the powdered chemical is first introduced by removing the valve-casing L and also the tube K', after which the tube is inserted and the valve-casing screwed upon the end of the vessel. In order to charge the vessel with compressed air or gas, it is inverted after the chemical has been introduced and a conduit leading from a source of fluid-pressure coupled to the discharge-tube N^3. The valve N' being unseated permits the fluid under pressure to pass into the vessel, charging the same to the desired degree of pressure, after which the valve is allowed to be seated and the extinguisher is in condition for use.

The principal difference between the two embodiments of my invention resides in the fact that in the form shown in Fig. 1 the extinguisher when in position for use is held in an upright position with the valve mechanism at the lower end thereof, while in the form shown in Fig. 2 the operative position of the extinguisher is the reverse—namely, the valve mechanism is at the upper end thereof. The dotted lines in each figure indicate approximately the relative spaces occupied by the chemical and the compressed fluid, the space below the dotted line being filled with the chemical and that above occupied by the air or gas under pressure.

From the foregoing description it will be observed that I have invented an improved fire-extinguishing apparatus which is at all times ready for use and under perfect control of the operator, inasmuch as there are no parts which can get out of order during the long period which may elapse before the apparatus may be required for use. It is also evident that by providing suitable washers and packing for the valve-seats the vessel is rendered air-tight, so that no loss of pressure can take place.

While I have described more or less precisely the details of construction, I do not wish to be limited thereto, as it is obvious that various changes may be made without departing from the spirit of my invention—such, for instance, as creating the requisite pressure within the vessel in other ways than by introducing air or gas under pressure, as by producing an explosion or creating a pressure by chemical reaction within the vessel when it is desired to use the extinguisher. It is also obvious that in lieu of the valve mechanism it would be feasible to seal the discharge-tube after the introduction of the air or gas under pressure, the discharge of the chemical being effected by breaking the sealed discharge-tube.

It is to be understood that the term "gas"

as used in the claims hereto annexed is intended to cover air or any form of fluid-pressure which is adapted to be used in connection with the powdered chemical to effect the discharge thereof from the vessel.

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

1. A fire-extinguisher comprising a vessel, a fire-extinguishing powder contained in the vessel, a gas under pressure confined within the vessel to which the powder is constantly exposed, and means for opening a discharge from the vessel through which the powder is forced by the pressure exerted directly thereon by the gas.

2. A fire-extinguisher comprising a vessel, a fire-extinguishing powder contained in the vessel, a gas under pressure confined within the vessel to which the powder is constantly exposed, a valve controlling a discharge-opening from the vessel, and means for unseating the valve to permit the powder to be discharged from the vessel by the pressure exerted directly thereon by the gas.

3. A fire-extinguisher comprising a vessel, a fire-extinguishing powder contained in the vessel, a gas under pressure confined within the vessel to which the powder is constantly exposed, a valve controlling a discharge-opening from the vessel and retained upon its seat by the pressure of the gas within the vessel, and means for unseating the valve against the pressure of the gas to permit the powder to be forced through the discharge-opening from the vessel.

4. A fire-extinguisher comprising a vessel, a fire-extinguishing powder contained in the vessel, a gas under pressure confined within the vessel to which the powder is constantly exposed, a valve controlling a discharge-opening from the vessel and retained upon its seat by the pressure of the gas within the vessel, a reciprocating rod extending into the vessel for unseating the valve, and a pivoted lever engaging the exterior end of said rod for reciprocating the same and unseating the valve to permit the discharge of the powder through the opening leading from the vessel.

5. A fire-extinguisher comprising a vessel, a fire-extinguishing powder contained in the vessel, a gas under pressure confined within the vessel to which the powder is subjected, a detachable valve-casing communicating with the interior of said vessel whereby the powder may be introduced into the vessel by removing the valve-casing, a discharge-tube communicating with the interior of the vessel through the valve-casing through which the vessel may be charged with the gas under pressure, and a valve for controlling the passage through said valve-casing to permit the discharge of the powder from the vessel by the pressure of the gas therein.

6. A fire-extinguisher comprising a vessel, a fire-extinguishing powder contained in the vessel, a gas under pressure confined within the vessel to which the chemical is exposed, a valve-casing located on the exterior of and communicating with the interior of the vessel, a valve coöperating with said valve-casing, a lever for unseating said valve, and a cap surrounding said valve-casing and supported on the end of the vessel, said lever and discharge-tube extending through apertures in said cap.

In testimony whereof I sign this specification in the presence of two witnesses.

ALBERT C. BATTELLE.

Witnesses:
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