

Van Deusen & Davis,

Fire Annihilator.

No. 106002.

Patented Aug. 2. 1870.

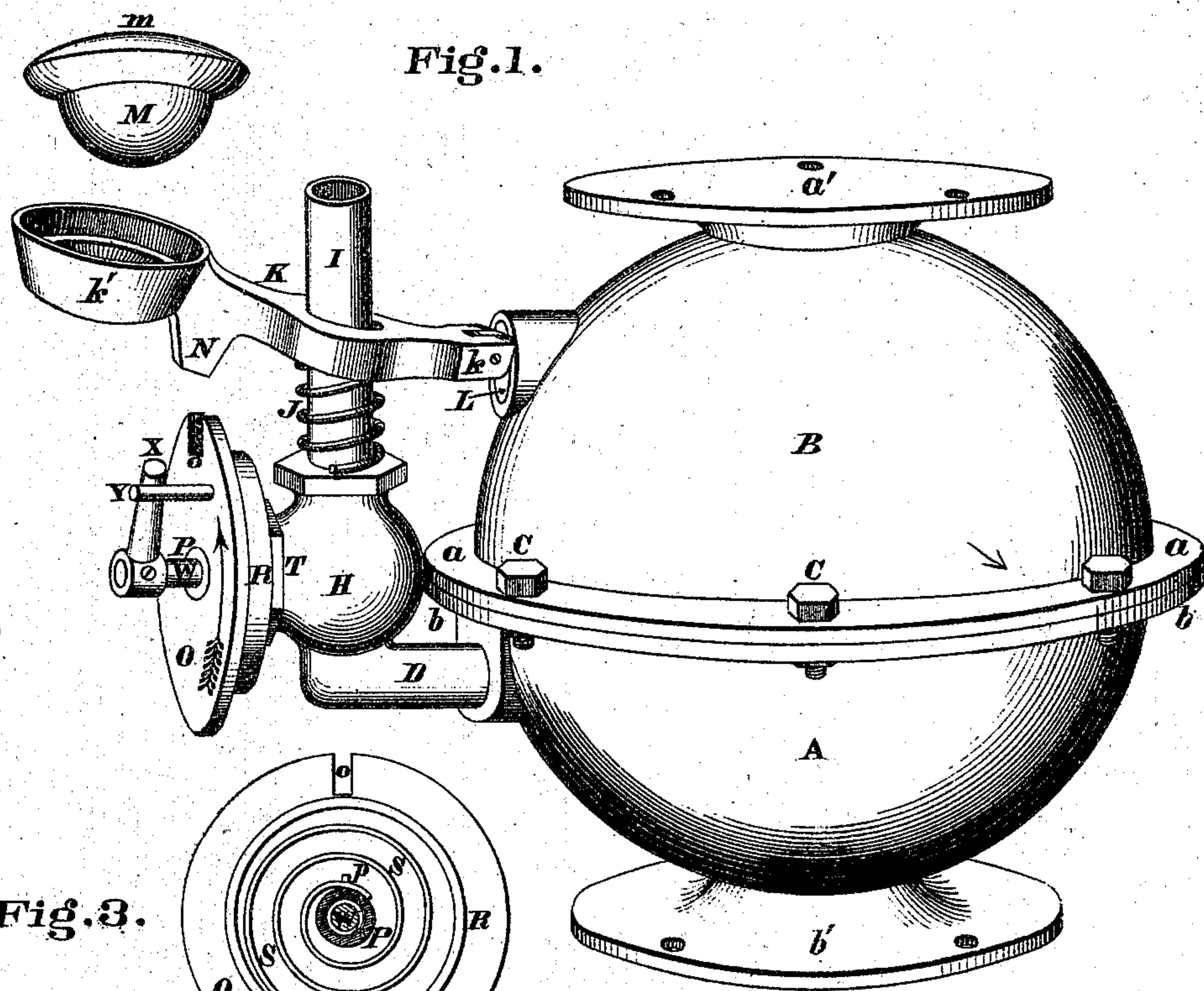
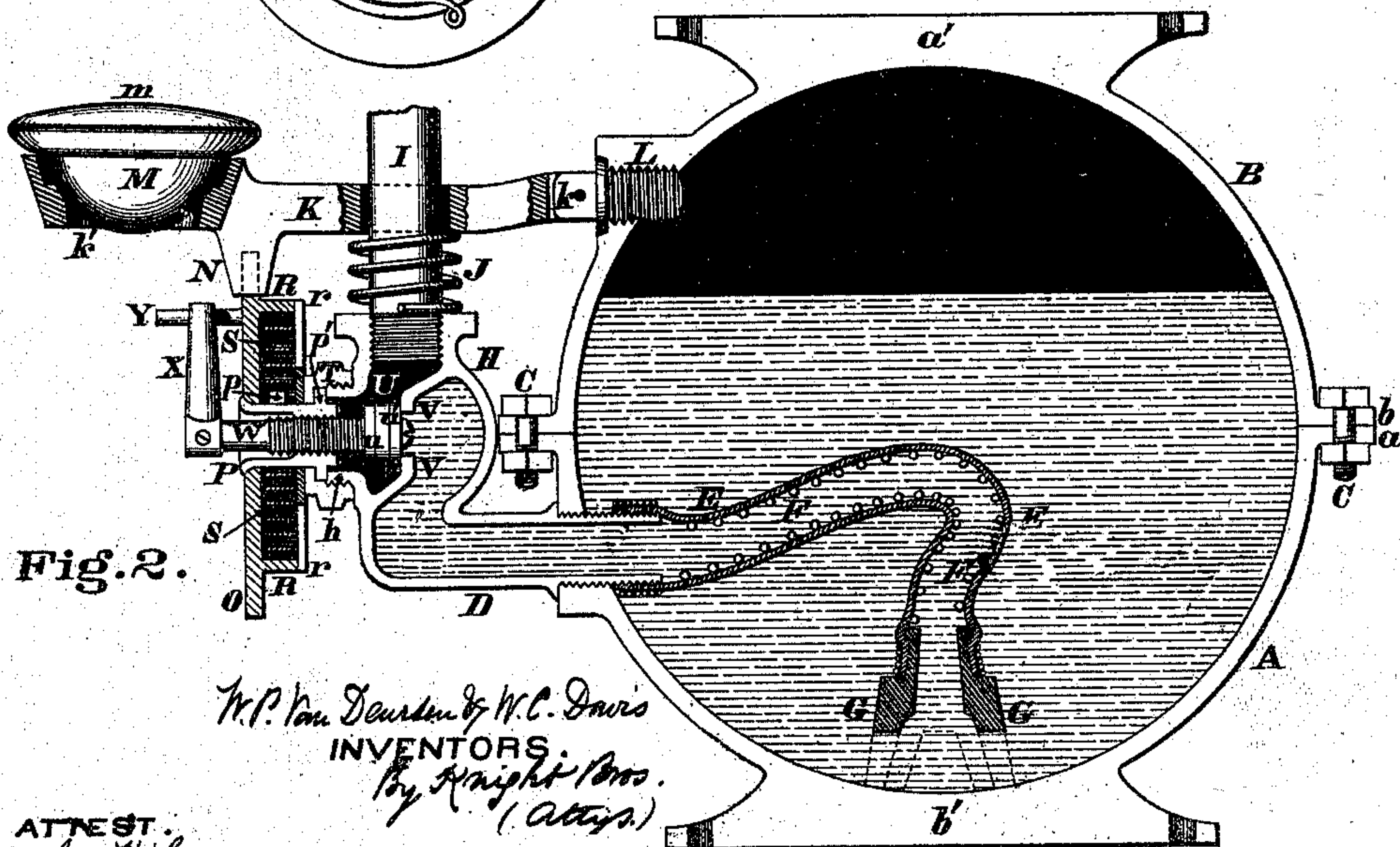


Fig. 3.



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IMPROVEMENT IN AUTOMATIC FIRE-EXTINGUISHERS FOR RAILROAD-CARS, &c.

Specification forming part of Letters Patent No. 106,002, dated August 2, 1870.

We, WILLIAM P. VAN DEURSEN and WILLIAM C. DAVIS, both of Cincinnati, Hamilton county, Ohio, have invented a new and useful Improvement in Automatic Fire-Extinguishers, of which the following is a specification:

Nature and Objects of the Invention.

This invention relates to certain improvements upon the automatic fire-extinguisher patented to H. C. Stewart and R. T. Bradley, March 29, 1870, and reissued to William P. Van Deursen and William C. Davis, May 24, 1870, and said improvements are designed to render such extinguishers more efficient and reliable by the application to them of the following new and useful devices: First, a peculiar arrangement of valve or cock, which effectually confines the extinguishing compound within its reservoir until a collision or upset occurs, when said valve is automatically opened by the rotation of its screw-threaded stem, which rotation is effected by a spring that is coiled within a suitably-notched disk or fly-wheel that acts by percussive force upon an arm projecting from said stem; second, the arrangement of a lever, one end of which is pivoted to the reservoir, while its other end has a socket or holder for the reception of a detachable weight that is dislodged from its seat by the act of collision or overturn, thereby permitting the free end of said lever to fly up, and, by withdrawing its detent from the notch of the wheel or disk which contains the coiled spring, to free the said wheel, so as to open the valve and permit the discharge of the contents of the reservoir into the stove or heating apparatus, the elevation of the lever being effected by a spring of any approved form; third, a flexible tube or hose, which is attached to the inner end of the discharge-pipe, and which is furnished with a loaded tripod, ball, or other device, whose weight compels it to rest upon the bottom of the reservoir, and thus insures the expulsion of the fluid contents of the latter, the tube being protected against collapsing by the provision of an internal spring; fourth, pivoting the loaded lever to a screw-threaded plug, which is inserted in the side of the reservoir in such a manner that, by simply unscrewing said plug, the reservoir can be filled with liquid; fifth, a peculiar-shaped weight, for resting in the

socket of the pivoted arm, the shape of the weight being such that it will maintain its position during any ordinary oscillation of the vehicle, and yet will be readily dislodged as soon as a collision or overturn occurs.

General Description with Reference to the Drawing.

Figure 1 is a perspective view of our improved automatic fire-extinguisher in its opened or effective condition. Fig. 2 is an axial section of the same in its closed condition; and Fig. 3 is a rear elevation of the fly-wheel or disk which contains the coiled spring for operating the discharge-valve, the spindle upon which the wheel is journaled being shown in section.

The reservoir or receptacle for containing the extinguishing compounds may be of any desired shape; but we prefer to construct it of two hollow hemispherical vessels, A B, which are united at their bases by flanges *a b*, and bolts, screws, or rivets C, in such a secure manner as to effectually prevent the escape of the contents of said reservoir. These hemispheres are also provided with supports *a' b'*, by which the entire apparatus can be attached to the car at any desired point.

Screwed into one side of the vessel A is a pipe, D, and, in order that said pipe may discharge the more fluid contents of the reservoir, its inner end has attached to it a flexible tube, E, which is secured against a collapse by the internal spring F. The free end of this tube carries a heavy tripod, G, whose weight is sufficient to keep it against the lowest part of the reservoir for the time being, no matter in what position the latter may be placed.

The flexible tube E should be long enough to extend across to any part of the interior of the reservoir, and the tripod should be heavy enough to always reach the bottom of the said reservoir.

The pipe D communicates with a globe-valve, H, from which projects vertically a discharge-pipe, I, whose lower portion is surrounded with a helical spring, J, and whose upper end may have a tube or pipe attached, for the purpose of conducting the contents of the reservoir into the stove or other heating apparatus. The helical spring J is confined between the top of the globe-valve H and the bottom of an

arm or lever, K, which is pivoted at K' to a screw-threaded plug, L, the latter being engaged in one side of the upper vessel, B, and in the same vertical plane as the pipe D. The outer or free end of the lever K has a socket, K', for the reception of a detachable weight, whose lower portion, M, is hemispherical, and whose top *m* has the represented flattened sphere or button shape.

Projecting downwardly from the lever K is a detent or catch, N, which is adapted, in the depressed condition of said lever, to engage with a notch, *o*, in the periphery of a fly-wheel or disk, O, the latter being journaled upon a tubular screw-threaded sleeve, P. The sleeve P is held securely in position and prevented from rotating by means of its collar *p'* being tightly clamped between the coupling T and the neck *h* of the globe-valve. The sleeve P serves as a nut for the screw-threaded stem W of a valve, which is composed of a metallic disk, U, having a leather or other suitable washers, *u u'*, secured to it, the one, *u*, bearing against the inner end of said sleeve when the valve is opened, and the other one, *u'*, impinging against the seat V when said valve is closed, as shown in Fig. 2.

Securely attached to the valve-stem W, so as to rotate therewith, is an arm, X, which is impelled by a pin, Y, that projects from the face of the fly-wheel O.

The discharge-pipe I may serve as a guide for the lever K', and also for the helical spring J, as herein represented.

Projecting rearwardly from the disk O is an annular flange, R, which, in connection with said disk and its radial arms *r*, serves to confine a volute spring, S, one end of which is attached to said flange, while its other end is secured to a pin, *p*, that projects from the sleeve P.

Operation.

The screw-threaded plug L is first removed from the reservoir, so as to permit of the latter being filled about two-thirds full of any suitable liquid, after which said plug is screwed firmly into its proper position. A pump is now applied to the upper end of the discharge-pipe I, and suitable gas or air forced into the reservoir until a proper pressure has been obtained, say, from one hundred to one hundred and fifty pounds per square inch, after which the valve U is closed against its seat V, as shown in Fig. 2. This closure of the valve U is effected by rotating the wheel in an opposite direction to that indicated by the arrow in Fig. 1, which act brings the pin Y to bear against the arm X, thereby compelling the valve-stem W to perform a simultaneous rotation with the arm X, pressing the washer *u* against the valve-seat Y, and causing the volute spring S to be wound tightly upon the sleeve P. When the valve U is completely closed, the notch *o* of the disk O is in such a position as to receive the detent N, which is, accordingly, engaged therewith, and, as soon

as the weight M *m* is seated in its socket K', the apparatus is ready for use or attachment to the heating apparatus. The shape of this weight is such that it cannot be dislodged from its seat by any ordinary oscillation of the car or vessel to which our extinguisher may be attached; but the instant a collision occurs or the vehicle is overturned said weight is thrown from its seat, and the arm K is immediately elevated by the action of the helical spring J, as shown in Fig. 1.

As this elevation of the free end of the lever K serves to withdraw the detent N from notch *o*, the volute spring S causes the wheel O to revolve in the direction of the arrow in Fig. 1, and, as this spring has been wound up in an opposite direction to that in which said wheel revolves, the latter makes an entire revolution before its projecting pin Y comes in contact with the arm X of the stem W, and, when it does, it strikes said arm with such an accumulated force as to insure the rotation of the stem and the opening of valve U, no matter how long the latter may have been resting upon its seat.

The uncoiling of spring S continues until the washer *u* is brought in contact with the inner end of sleeve P, in which condition the valve U is fully opened and the contents of the reservoir are instantly discharged, through pipe I, into the stove or heating apparatus, and the fire in the latter is immediately extinguished.

When the valve U is wide open, and its washer *u* is in contact with the inner end of the sleeve P, there can be no escape of the extinguishing agent around the valve-stem, and this provision of the washer *u* enables the valve-stem to be operated without employing a stuffing-box, whose unavoidable friction might retard, if not altogether prevent, the proper action of the spring S.

While describing the preferred form of our improvement, we do not restrict ourselves thereto, as, for example, the tank may be constructed so as to generate the gas or gases automatically, by the collision or overturn of the car or other vehicle, at the same time the discharge valve or valves are opened, as described.

Claims.

We claim as new and of our invention—

1. Providing a fire-extinguishing apparatus with a discharge-valve which is opened by the accumulated force generated by a spring, said spring being automatically liberated at the moment of collision or overturning of the car or vessel to which the apparatus is applied by any suitable mechanism, for the purpose set forth.
2. The provision for forcibly opening the discharge cock or valve of a fire-extinguisher by the automatic liberation of a spring or its equivalent, for the purpose set forth.
3. The specific device for applying the accumulated force of a blow to insure the open-

ing of the valve, to wit: the screw-threaded valve-stem, adapted to receive the blow or impact of a pin or projection from a spring fly-wheel, automatically liberated, as and for the purposes set forth.

4. The arrangement within the boxed wheel of a clock-spring, attached at one end to the sleeve of the screw-threaded valve-stem, and at its other end to said box-wheel, near the periphery thereof, for the purpose set forth, as herein described.

5. The provision within the holder or gas-chamber of a fire-extinguisher of a flexible tube, guarded against collapse or kinking by a coiled spring or rings within it, and furnished at its extremity with a loaded tripod or ball, so that its said extremity or receiving end may always be in communication with the (for the time being) lowest part of the holder, and thus discharge the liquid and the gas absorbed by it first, as herein described.

6. In this connection, the provision of the two washers, one on each side of the valve, for the prevention of leakage both in the open and in the closed condition of the valve, as herein explained.

7. The feed-orifice Z, having the screw-threaded plug, which serves as the shank of the weighted lever K, as set forth.

8. The discharge-pipe I, when used as a guide for both spring J and lever K, as set forth.

9. The ball or load M *m*, when of the form of a flattened sphere or button, as and for the objects stated.

In testimony of which invention we hereunto set our hands.

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WILLIAM C. DAVIS.

Witnesses:

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JAMES H. LAYMAN.