(No Model.) 2 Sheets—Sheet 1.

J. HILL.

AUTOMATIC FIRE EXTINGUISHER.

No. 283,242. Patented Aug. 14, 1883.

Fig. 1.

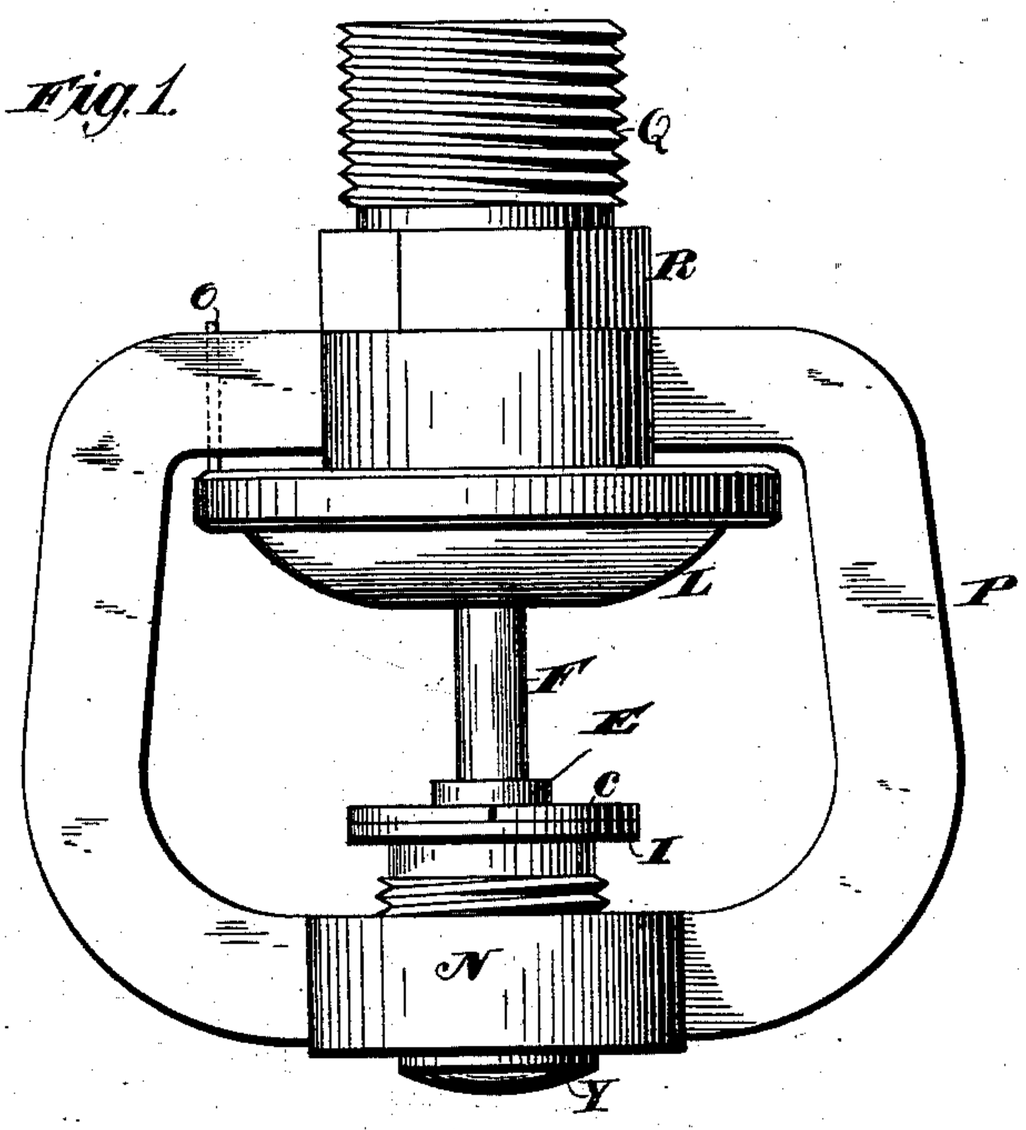
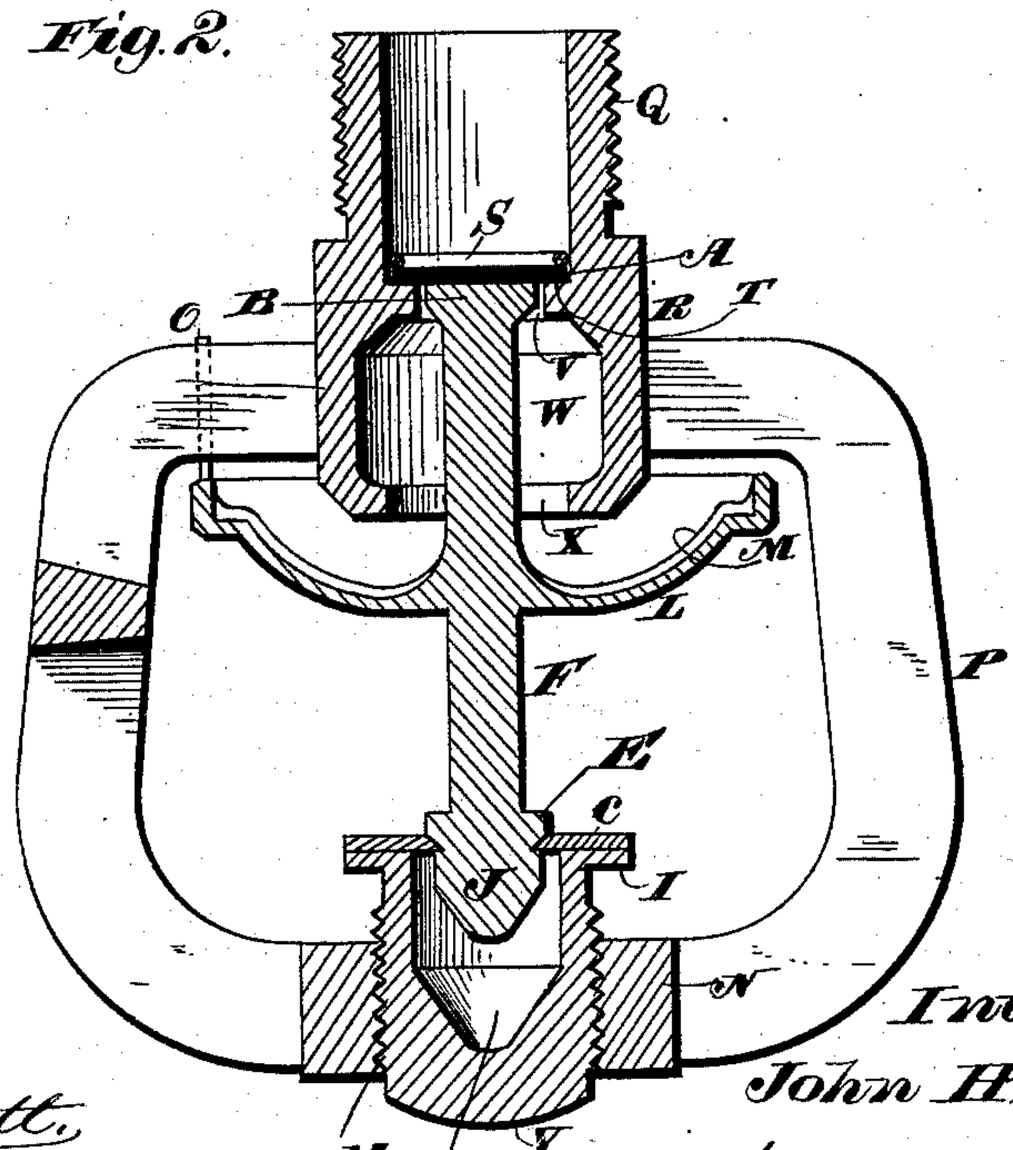


Fig. 2.



Witnesses.

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Inventor:

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By James L. Norris.

Atty.

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

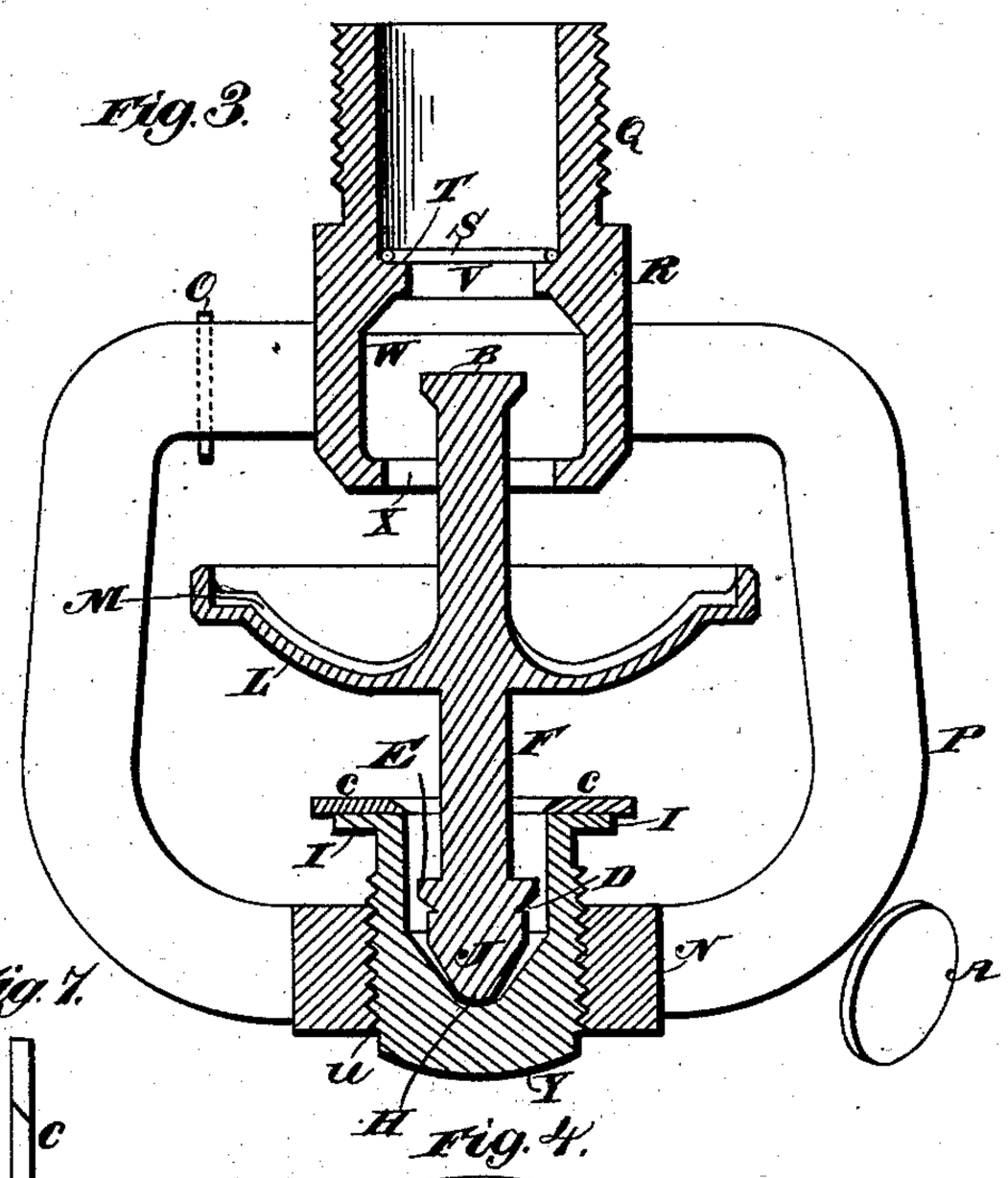


Fig. 5.

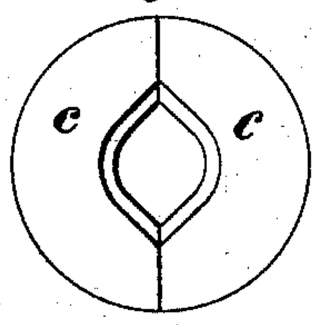


Fig. 7.

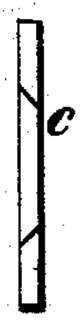


Fig. 6.

Fig. 4.

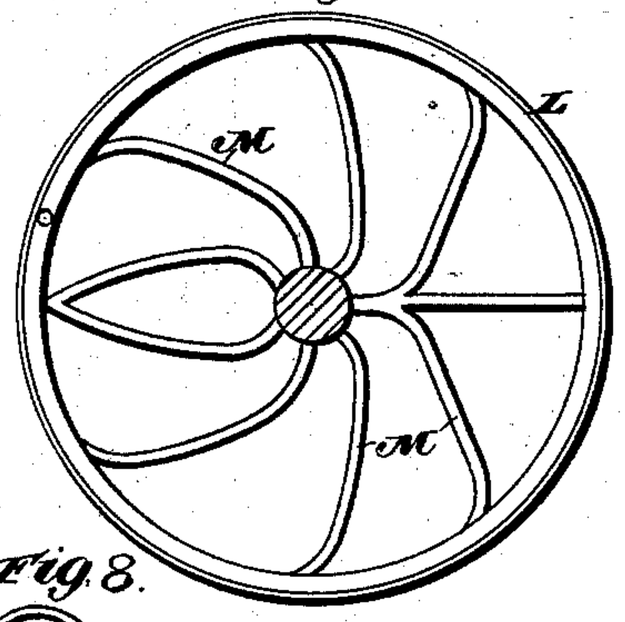


Fig. 11.

Fig. 12.

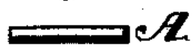


Fig. 8.

Fig. 9.

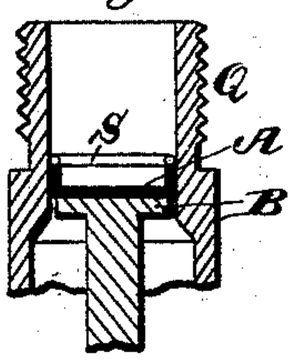


Fig. 10.

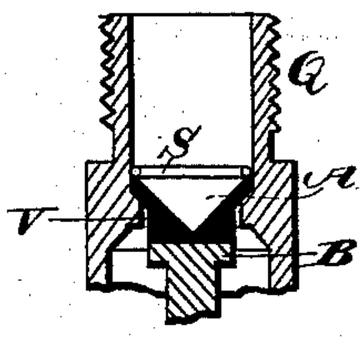
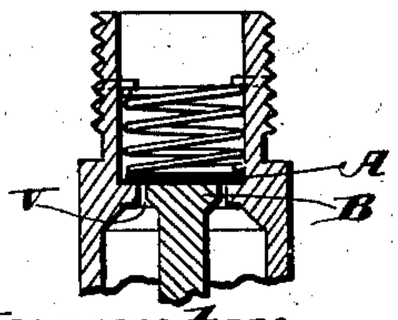


Fig. 13.



Witnesses.
Robert Everett.
J. A. Rutherford.

Inventor.
John Hill.
By James L. Norris.
Atty.

UNITED STATES PATENT OFFICE.

JOHN HILL, OF COLUMBUS, GEORGIA.

AUTOMATIC FIRE-EXTINGUISHER.

SPECIFICATION forming part of Letters Patent No. 283,242, dated August 14, 1883.

Application filed March 1, 1883. (No model.)

To all whom it may concern:

Be it known that I, JOHN HILL, a citizen of the United States, residing at Columbus, in the county of Muscogee and State of Georgia, have invented new and useful Improvements in Automatic Fire-Extinguishers, of which the following is a specification.

This invention relates to automatic fire-extinguishers, and has for its object to provide means whereby the extinguishing-fluid, under pressure in a pipe, is automatically liberated by the fusing of a solder-joint, and by novel devices, distributed upon the fire. The invention has other objects, all of which will be hereinafter explained.

The invention consists in the construction and combination of devices, which will be fully described in detail, and set forth in the claims, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of an automatic fire-extinguisher constructed in accordance with my invention. Fig. 2 is a central vertical sectional view of the same, with the solder-joint unbroken and its valve on its seat; Fig. 3, a central vertical sectional view, with the solder-joint broken and the valve thrust through the port of the valve-seat; Fig. 4, a top plan view of the distributer. Figs. 5, 6, and 7, detail views of the divided disk for supporting the spindle in its elevated position to sustain the valve and confine the fire-extinguishing fluid. Figs. 8 to 13, inclusive, are detail views, showing different constructions and arrangements of valves and means for confining the same against accidental displacement.

In the drawings, the letter P indicates an open metallic frame, preferably composed of a single piece, with a lower arm provided with an annular hub-like enlargement, N, having a female screw-threaded socket, *u*, while the upper arm of the frame is constructed with an annular shell, R, having a chamber, W, and a screw-threaded tubular neck, Q, for connecting the frame with the pipe containing the fire-extinguishing fluid under pressure.

Below the base of the neck the interior of the shell R is provided with a valve-seat, T, and a port, V, and the lower end of the shell is provided with a port, X, of larger diameter than the upper port.

A screw-threaded plug, Y, is arranged in the socket *u* of the hub N, and is provided with a cavity, the lower end of which is conical to form a step or bearing, H, the upper end of the plug being flanged to form a horizontal seat, I, for receiving the divided disk *c*, each part of the latter being approximately semicircular to create a central opening, as shown in Fig. 5.

The combined water deflector and distributer is composed of the spindle F, having a lower conical end or point, J, and boss E, directly under which is provided an annular groove or recess, D, and at or adjacent to the center of the spindle is provided the cup-shaped or concave disk L, having ridges M on the upper surface, which constitute the fluid-distributer, while the upper end of the spindle is flat or plane, as at B, to form the fluid-deflector. The upper surface of the annular groove D is beveled, and the edges of the central opening of the divided disk *c* are also beveled to correspond. The deflecting end B of the spindle is arranged in the chamber of the shell R, and its conical or pointed end J is arranged in the cavity of the plug Y, while the distributer L is located between these parts, as shown. If the spindle be lifted and the circular edges of the divided disk *c* caused to engage the annular groove D, and then soldered to the horizontal seat I of the plug Y, the deflecting end of the spindle will be held within the port V and flush with the upper surface of the valve-seat T.

The valve A is composed of a thin circular disk of leather, rubber, or other flexible material suitable for the purpose, and it is applied to position by inserting it through the outer end of the neck Q, and causing it to rest squarely upon the valve-seat T, which supports its edges, while its center will be sustained by the deflecting end of the spindle.

To prevent the valve from being displaced by handling or otherwise, I employ a split ring, S, of spring metal, which is introduced into the neck Q until it presses tightly onto the valve, the expansive force of the ring serving to hold it in place by frictional contact

with the interior surface of the neck. When the frame is attached to a pipe containing the fire-extinguishing fluid under pressure, the parts will be in the position shown in Figs. 1 and 2, and obviously the pressure of the confined fluid will hold the valve firmly and squarely upon its seat so long as the spindle remains supported by the soldered joint—that is, the disk *c* joined to the seat I by a fusible compound. Under ordinary conditions this joint will fuse at 160° Fahrenheit, and when such degree of heat is reached, as in case of a conflagration, the disk *c* will become loosened on its seat, and the spindle F, thus becoming unsupported, will descend until its conical or pointed lower end reaches the step or bearing H in the plug Y. The center of the valve losing its support, the pressure of the confined fluid will collapse the valve and thrust it through the port V, the parts assuming the position shown in Fig. 3, whereby the fluid becomes liberated. The diameter of the end B of the spindle being slightly greater than one-half the diameter of the chamber W, the inflowing fluid will be deflected from the side of the chamber upon which the deflecting end B has fallen to the opposite side of the dis-distributer L. As the quantity of fluid thus deflected strikes the elevated side of the distributer in greater quantity, its force causes the distributer to quickly and violently change its position and the end B to pass to the other side of the chamber W, when the water, being deflected to the other side, reverses the operation, and so on continuously, very rapidly distributing and throwing the fluid in all directions, determined by the form of the distributer and its oscillations. To provide, however, for changing the oscillations of the distributer—that is to say, to rotate it in different directions upon its pivot J—the face of the distributer is provided with radial, spiral, and other ridges or grooves, M, which, by the force of the water, will serve to give to the distributer a slight turn in one or the other direction, and to change the direction of its oscillations. The particular form of these ridges, grooves, or of the surface of the distributer is not material, it being only designed to break up and distribute the water in various directions. The varying angles of incidence and reflection, caused by the oscillation of the distributer and the changes in direction of current by the deflector B, cause this distribution to cover a very considerable area, and is of value in the construction shown. The flexible valve may be held to its seat by a spiral spring, as in Fig. 13; or it may be conical, with a conical cavity, as in Fig. 10, and be retained against accidental displacement by the split ring S, as before explained, and in some instances the valve-seat T may be dispensed with, in which case the valve will be cup-shaped, and held against displacement by the split ring, as in Fig. 9. The split ring for confining the valve is preferable, as it is the most simple contrivance. Any form of valve may be used which will allow the pressure of the confined fluid to tighten the valve against its seat on the deflecting end of the spindle when the latter is supported, and sufficiently flexible to collapse and be thrust or forced through the ports V and X when the support to the spindle is removed.

It may be properly stated that when the soldered joint begins to fuse the pressure of the fluid is upon the beveled edges of the disk *c* and beveled side of the groove D, and this wedging action, as soon as the solder is sufficiently melted, presses apart the two sections of the disk, and the diameter of the boss E on the spindle is sufficient to throw the sections so remote that the oscillations of the distributer will not be interfered with, even should the cooling influence of the falling fluid resolder the disk *c* to its seat.

The screw-plug Y can be vertically adjusted in the socket *u*, and thus adjust the spindle with reference to the valve-seat for the valve A.

When the end B of the spindle is properly adjusted into the port V and the parts are in the position shown in Figs. 1 and 2, a pin, O, arranged in a vertical aperture in the frame P, can be moved downward and made to engage an aperture in the periphery of the distributer L, thus preventing any rotation of the spindle.

The extinguisher is adapted for use with water or any other fire-extinguishing fluid or liquid compound.

Having thus described my invention, what I claim is—

1. In an automatic fire-extinguisher, the combination of a frame having a neck for connecting it with a pipe containing the extinguishing-fluid, a flexible valve, and a support for said valve sustained by a fusible joint, said valve being entirely unattached to the support and held to its seat by the pressure of the confined fluid, and when unsupported caused to collapse and be forced from the support and from the extinguisher by the extinguishing-fluid, substantially as described.

2. A fluid deflector and distributer for automatic fire-extinguishers, composed of a spindle having a flat upper end for deflecting the fluid, a conical or pointed lower end for permitting the spindle to oscillate, a disk intermediate the two ends of the spindle for distributing the fluid, in combination with a frame having a seat to support the spindle when oscillating, substantially as described.

3. In an automatic fire-extinguisher, the combination of a frame provided with a chambered shell and a step or bearing below the same, a spindle having a conical or pointed lower end, a fluid-deflecting flat upper end, and a water-distributing disk intermediate the two ends, said spindle adapted to rest on the step or bearing, substantially as and for the purpose described.

4. The combination of an open frame having

a chambered shell and a step or bearing below the same, a spindle having a fluid-deflecting flat upper end located in the chamber of the shell, a conical or pointed lower end adapted to rest on the step or bearing, and a fluid-distributing disk intermediate the two ends, with a flexible valve supported by the deflecting end of the spindle and held to its seat to confine the fluid by the pressure of the latter, and a fusible joint for sustaining the spindle, substantially as described.

5. In an automatic fire-extinguisher, a spindle carrying at its upper end a deflector, and below the same a distributing-disk having ridges or grooves upon its upper surface, said spindle being supported at its lower end, and by the liberation of the extinguishing-fluid caused to oscillate and rotate, substantially as described.

6. In an automatic fire-extinguisher, the combination, with the valve and the spindle having a conical or pointed lower end provided with an annular groove, of the divided disk, each section of which is provided with a beveled edge to engage the groove, said disk being soldered to its seat, and releasing the spindle when the solder melts, substantially as described.

7. In an automatic fire-extinguisher, the combination of the divided disk *c*, the spindle F, having at its lower end the annular groove D, the boss E, directly above the latter, the deflecting end B, and the distributer L, between the ends, with the supporting-frame having a chambered shell, R, provided with a neck, Q, and ports V and X, and a flexible valve supported by the deflecting end of the spindle, and confined on its seat by the pressure of the confined fluid, substantially as described.

8. In an automatic fire-extinguisher, the combination of the adjustable plug Y and the spindle F, having the conical end J, groove D, boss E, distributer L, and deflecting end B, with the divided soldering-disk *c*, and valve A, supported by the spindle, substantially as described.

9. In an automatic fire-extinguisher, the combination of the spindle F, having the conical or pointed end J, distributer L, and deflecting end B, with the divided ring *c*, and the flexible valve A, arranged for operation substantially as described.

10. The combination of the frame P, having the pin O, with the valve-supporting spindle having the distributer L, substantially as described.

11. The combination of the stem F, having an annular groove, D, and boss E, with the plug Y, having a cavity and a horizontal seat, I, and the divided soldered ring *c*, substantially as described.

12. In an automatic fire-extinguisher, the combination, with the valve-supporting spindle F, of the valve A, and the split ring S, arranged over the valve to retain it upon the spindle, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

JOHN HILL.

Witnesses:
G. GUNBY JORDAN,
E. P. BURNETT.