(No Model.)

F. GRINNELL.

AUTOMATIC FIRE-EXTINGUISHER.

No. 266,989. Patented Nov. 7, 1882.

Fig. 1.

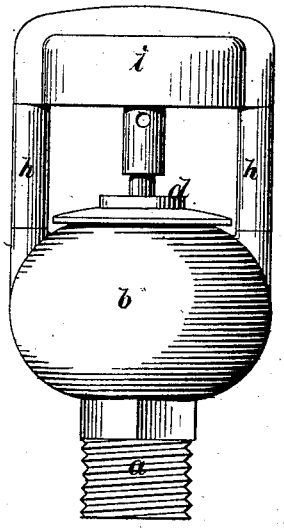


Fig. 2.

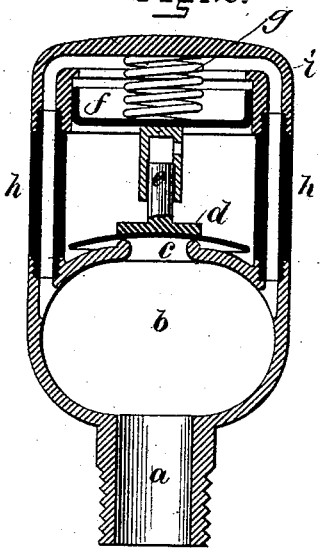


Fig. 3.

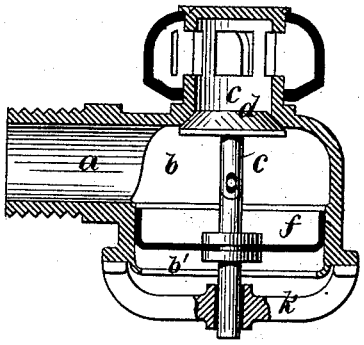
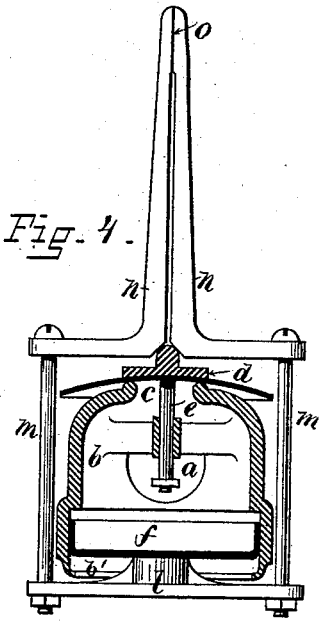


Fig. 4.



WITNESSES:

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UNITED STATES PATENT OFFICE.

FREDERICK GRINNELL, OF PROVIDENCE, RHODE ISLAND.

AUTOMATIC FIRE-EXTINGUISHER.

SPECIFICATION forming part of Letters Patent No. 266,989, dated November 7, 1882.

Application filed February 20, 1882. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK GRINNELL, of the city and county of Providence, and State of Rhode Island, have invented a new and useful Improvement in Automatic Fire-Extinguishers; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification.

This invention has reference to an improvement in automatic fire-extinguishers in which the valve is held to its seat by the pressure of the water or other fire-extinguishing fluid, and is also opened by the pressure of the water. It is an improvement on Letters Patent No. 248,829, granted to me October 25, 1881, for improvement in automatic fire-extinguishers; and it consists in the use of a piston fitting into a case and acted upon by the pressure of the fluid contained in the pipes to which the device is secured, as will be more fully set forth hereinafter.

Figure 1 is a view of an automatic fire-extinguisher in which a valve provided with a deflector is held to a fixed seat by means of a piston movable in a case and acted upon by the internal pressure, said valve and deflector being secured to a hollow stem by a fusible solder, which by the action of heat fuses and allows the valve and deflector to be moved from the opening by the internal pressure. Fig. 2 is a sectional view of the same device shown in Fig. 1. Fig. 3 is a sectional view of an automatic fire-extinguisher in which a rotating distributer is mounted on a stem above the valve, the valve being held to its seat by the internal pressure and opened by the internal pressure acting on a piston of much larger area than the valve. Fig. 4 is a sectional view of an automatic fire-extinguisher in which the valve with its deflector is held to its seat by the internal pressure exerted on a piston of larger area than the valve-opening, acting on a frame which bears on the valve, and which frame is held together by a fusible solder, so that by the action of heat the frame will separate and allow the valve to open and the water to flow against the deflector to be dispersed over a large area.

In the drawings, *a* is the inlet; *b*, the case; *c*, the outlet; *d*, the valve; *e*, the valve-stem, and *f* the piston, acted upon by the internal pressure, and of larger area than the outlet opening *c*. *g* is a coiled spring, which holds the piston so as to press on the valve to hold it against the seat before the internal pressure is exerted on the piston.

Referring now to Figs. 1 and 2, *h h* are two hollow arms connecting the chamber *i* with the case *b*, so that fluid can enter the same and press on the piston *f*. To this piston a hollow stem is secured, into which the stem *e* of the valve *d* enters, and in which the said stem is secured by a solder fusible at a low temperature. As the area of the piston *f* is much greater than the area of the outlet covered by the valve *d*, the said valve is firmly held against the seat surrounding the outlet until the solder is melted and the valve-stem can enter the hollow stem, thus allowing the valve to rise by internal pressure, and discharging the water against the deflector. A suitable stop is provided by which the motion of the piston is arrested, such as the lip or projection *b'* shown in Figs. 3 and 4.

Referring to Fig. 3, it will be seen that the valve-stem is jointed by a pin working in a slot between the piston *f* and the valve *d*. The lower end of the valve-stem is secured in the yoke K by fusible solder. The valve *d* is therefore free to seat itself, and is held to its seat by the internal pressure. When, now, the solder melts by which the valve-stem is secured in the yoke K, the pressure on the piston *f* will pull the valve *d* from its seat and allow the fire-extinguishing fluid to escape; and referring to Fig. 4, it will be seen that the internal pressure acting on the piston *f* will, through the intervention of the frame *l m n*, hold the valve *d* to its seat as long as the long ends of the levers *n n* are united by the solder at *o*. As soon as the solder is fused by heat the frame will fall apart and the valve will be forced from its seat by the internal pressure. The use of the piston allows of a longer traverse than is possible with the diaphragm described in the patent herein referred to, and greater force is exerted with the same area, as the piston is acted upon on the whole of the area, while the diaphragm is secured at its outer rim. The solder joint is therefore more easily ruptured when once fused by heat.

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

1. In an automatic fire-extinguisher, the combination, with a valve held to its seat by the pressure of the fire-extinguishing fluid, of a piston acted upon by the internal pressure, constructed to operate as and for the purpose described.

2. An automatic fire-extinguisher consisting of a valve acted upon by the internal pressure and a piston connected with the valve and arranged to hold the valve to its seat until by the action of the heat the device holding the valve is released and the valve is opened by the pressure of the fire-extinguishing fluid.

FREDERICK GRINNELL.

Witnesses:
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