

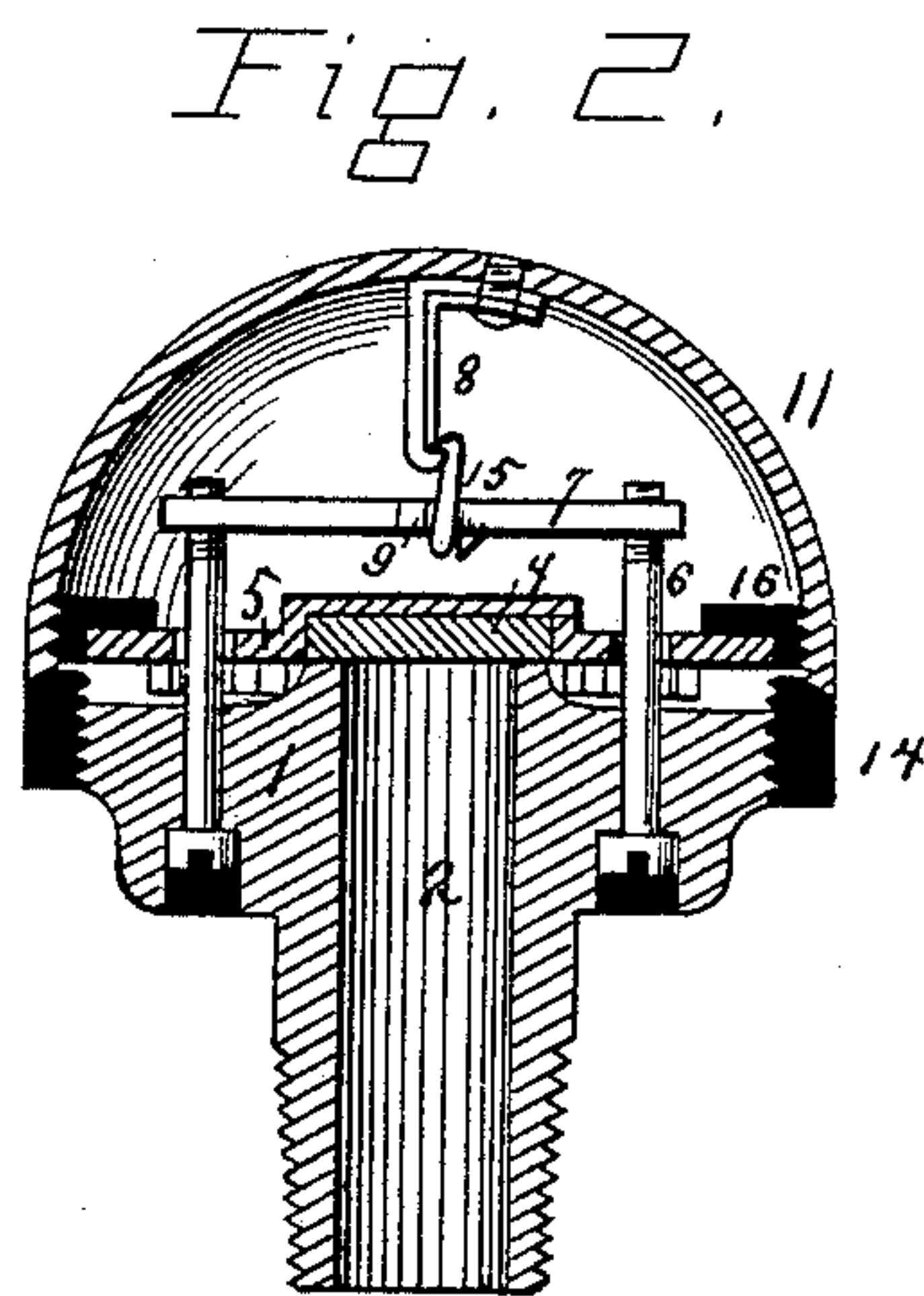
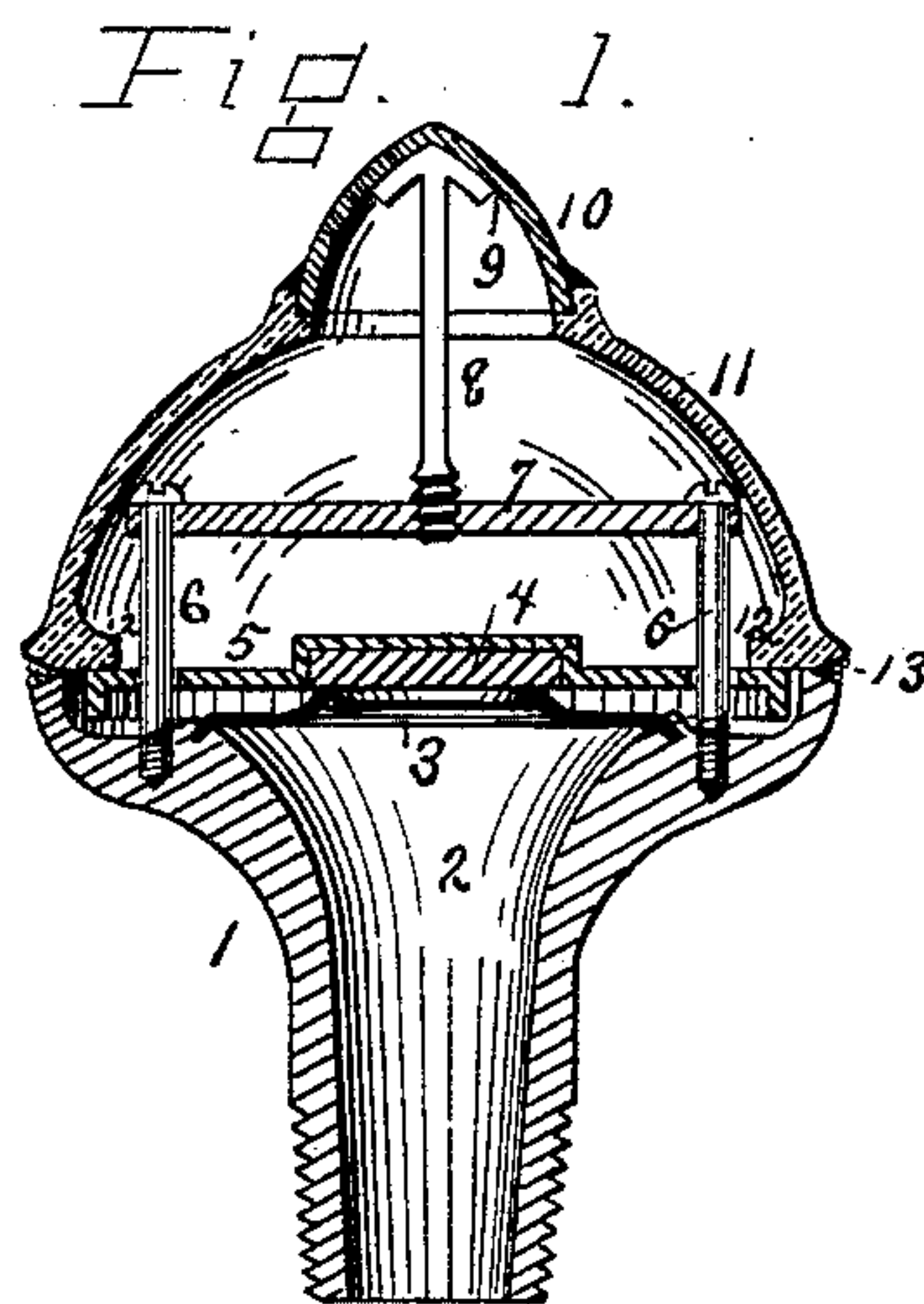
(No Model.)

2 Sheets—Sheet 1.

F. GRINNELL.
AUTOMATIC FIRE EXTINGUISHER.

No. 399,520.

Patented Mar. 12, 1889.



Attest:

Wm. Burnett
J. George Seltzer

Inventor:

Frederick Grinnell
by Knight Bros
Attys

(No Model.)

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Fig. 3.

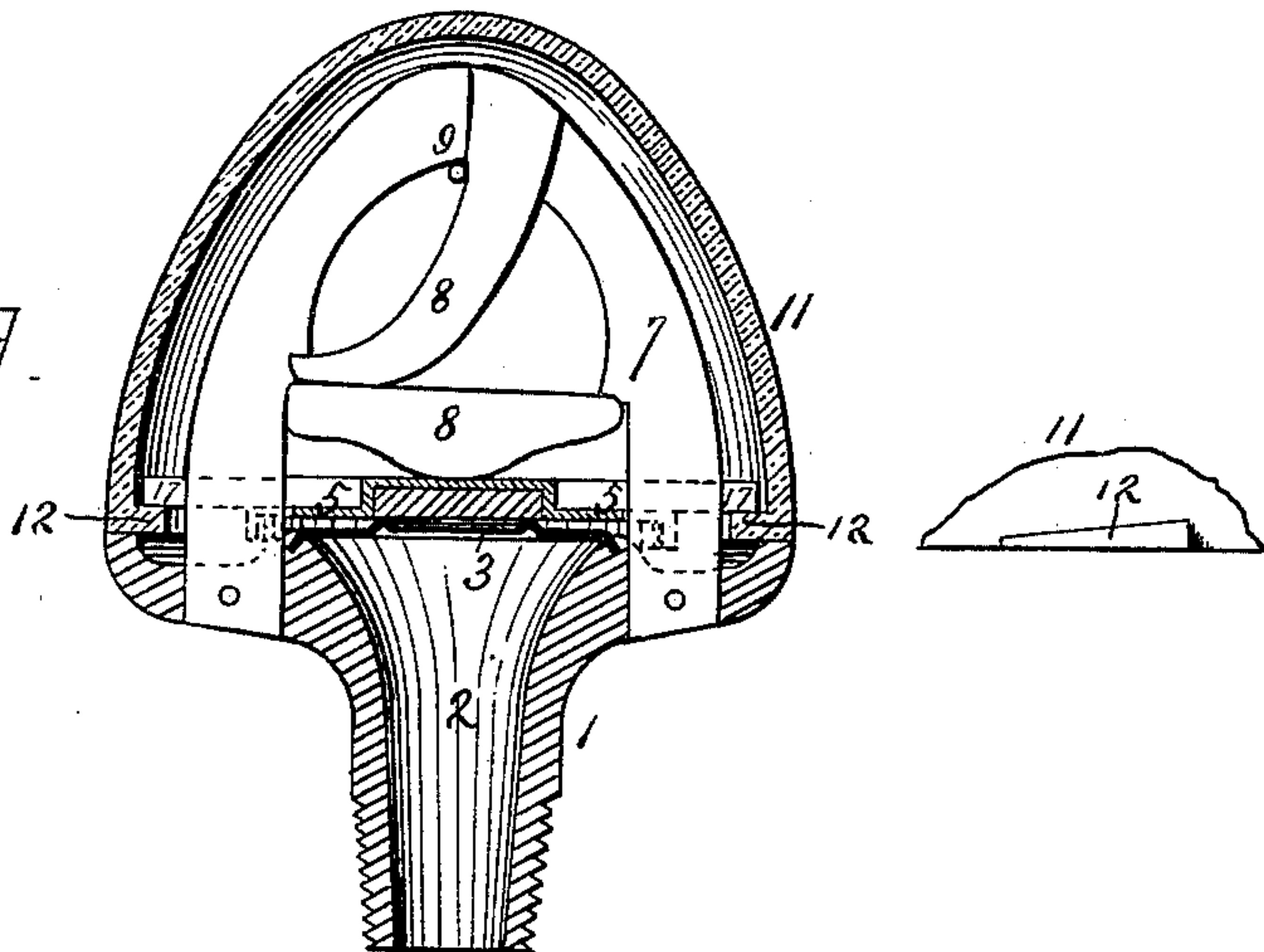


Fig. 4.

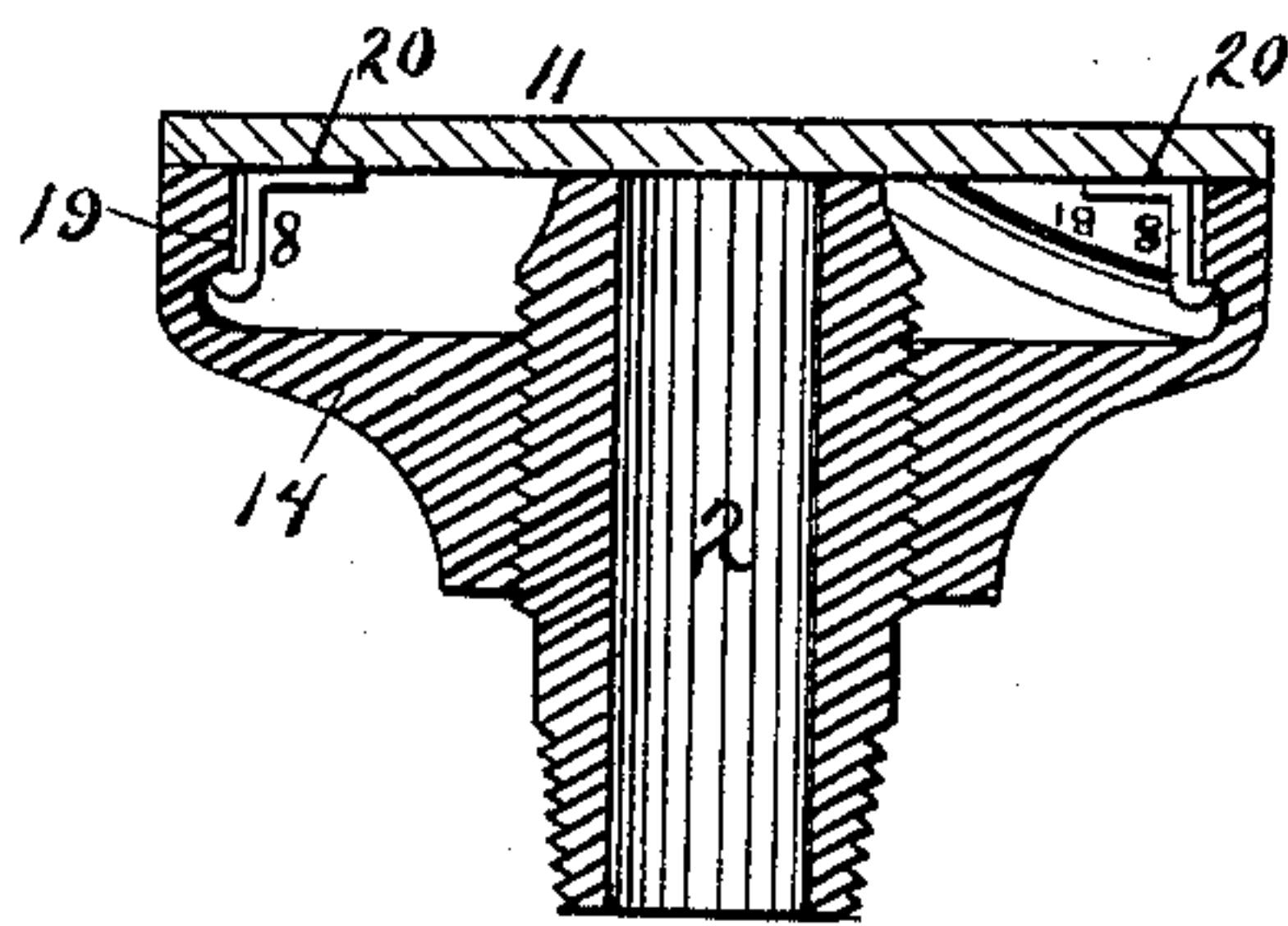
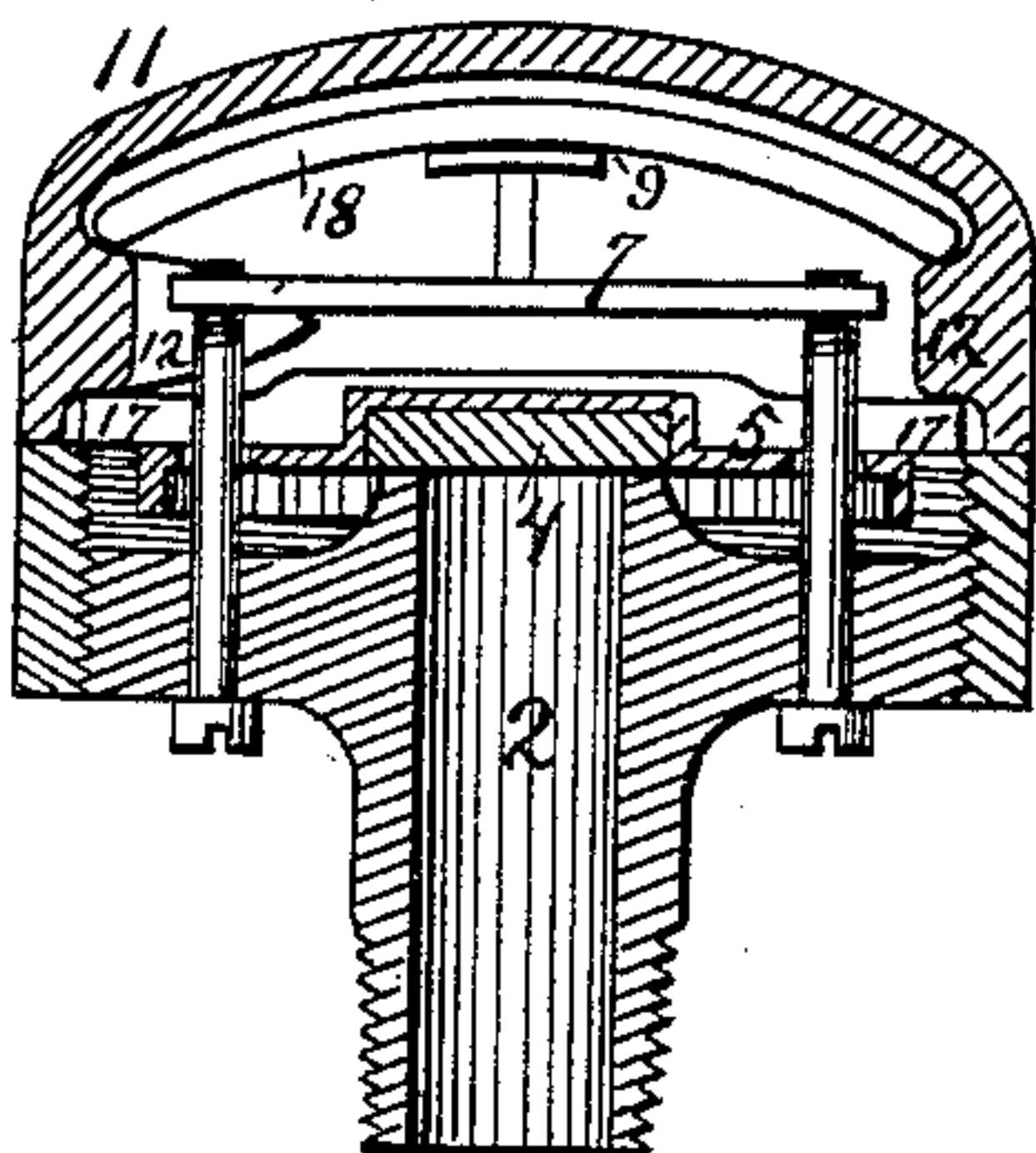


Fig. 5.

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UNITED STATES PATENT OFFICE.

FREDERICK GRINNELL, OF PROVIDENCE, RHODE ISLAND.

AUTOMATIC FIRE-EXTINGUISHER.

SPECIFICATION forming part of Letters Patent No. 399,520, dated March 12, 1889.

Application filed February 3, 1888. Serial No. 282,958. (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, of which the following is a specification.

My present invention relates, primarily, to means for protecting the more sensitive parts of an automatic fire-extinguisher from corrosion or the accumulation of dirt, &c.; and to this end the most essential feature of the invention consists of a protecting-cap fitted air-tight to the extinguisher and held from within by a device adapted to be operated by heat in such manner as to release or throw off the cap when a certain temperature is attained.

The protecting-cap may be held onto the sprinkler or extinguisher by a heat-actuated device independent of that which holds the valve closing the water-outlet; or I may use the cap for holding the valve, or the valve for holding the cap, in the former case the cap being held by the said device, and in the latter case the valve being so held.

In whatever form I apply my invention it is my intention to have the heat-actuated device entirely within the space closed by the cap, so as to be protected thereby, and to accomplish this I prefer to add a mechanical connection between the said device and the cap or sprinkler, so that the cap may be attached after the said heat-actuated device has been adjusted.

The heat-actuated device may be the well-known soldered joint or any other suitable heat-actuated device. The joint between the projecting-cap and the sprinkler is made air-tight, and may be sealed with wax or other non-corrodible packing; but this sealing plays no part in holding the cap in place, the heat-actuated device which is depended upon for this purpose being placed, preferably, as far from the body of the sprinkler and the said joint as possible, so as to be less influenced by the cooling action of the metal of the sprinkler and of the water contained therein. The protecting-cap may be made in whole or in part of non-corrodible or heat-insulating material.

In the accompanying drawings, Figure 1 is

a sectional view of an extinguisher, showing the composite protecting-cap. Figs. 2, 3, 4, and 5 are similar views of modifications hereinafter described.

Referring first to Fig. 1, the base 1 of the extinguisher is of the usual pattern, having water-passage 2 and flexible valve-seat 3. The valve 4 is also of the usual pattern, having deflector 5 attached to it. The deflector is guided by screw-studs 6, which support a cross-piece, 7, the studs and cross-piece forming what I call the "yoke." A post, 8, screws into the cross-piece, and the angle of the end of the post is soldered at 9 to a metallic cap, 10, fitted and sealed into a hole in the cap 11. This cap 11 is of glass or other non-corrodible substance, and it is preferably, also, of a character that will conduct heat poorly. It is seated with an air-tight joint to the periphery of the base of the extinguisher, and it is provided with a flange or lugs, 12, that project far enough inward to bear upon the deflector, and thereby hold the valve closed. The meeting edges of the base and cap may be flared, as shown, and in the crevice thus formed twine, yarn, or the like, 13, saturated with paraffine or other non-corrodible and fusible substance, may be wrapped to make the joint air-tight. The cap 10 may be sealed into the glass cap by plaster-of-paris, sealing-wax, or the like, and it may be coated with or made of a non-corrodible substance.

In Fig. 2 I have shown a modification of my invention, in which a rigid valve-seat is used together with an adjustable cap-seat. The latter is formed by a ring, 14, screwed onto the periphery of the base and capable of being turned thereon until it seats up against the cap. The deflector is in this case shown secured to the cap by a screw-thread, and the studs 6 are shown adjustable from the outside, so as to permit the adjustment of the valve without disturbing the cap. The heat-actuated device is here shown as consisting of a hook, 8, engaging under a dog, 15, on the yoke and formed of two metals, which expand differently with heat, so that when subjected to an abnormal temperature the hook will be bent out and free from the dog 15, and thus release the cap and valve. The cap is supposed in this case to be of metal, and the hook is riveted or otherwise secured to the crown

of the cap, as shown. A lug, 9, on cross-piece 7 serves to limit the motion of dog 15, so that while the latter can swing freely upon the cross-piece for normal movements of the hook 8, yet when the hook is bent beyond the ordinary by an abnormal increase in temperature the dog will rest against the lug 9 and allow the hook to be forced free of the dog. The ring 14 may be made of vulcanized fiber or other non-metallic substance, so as to, first, prevent sticking by corrosion, and, second, to prevent the flow of heat from the cap to the base. The deflector 5 may have between it and the cap a ring, 16, of a similar heat-insulating material.

In Fig. 3 I have shown a modification in which the valve or deflector holds the cap, and in this case the cap may be of glass with interior lugs, 12, engaging under arms or flanges extending out from the deflector 5. The valve and deflector are in this case held by yoke 7, levers 8, and soldered joint 9, in the well-known way. The lugs 12 do not extend all around the cap, but are sufficiently far apart to allow the arms 17 to pass up between them; when a slight turn of the cap is all that is necessary to lock it into place like a bayonet-joint. The lugs 12 or the arms 17 should be inclined slightly, so as to wedge the cap down to its seat as it is turned.

In Fig. 4 is shown a modification similar to that shown in Fig. 2, but differing in the fact that it shows a glass globe or cap instead of a metallic one. The lugs 12 are made wedge-shaped, and serve, by being forced in under cross-piece 18, to hold the cap to its seat. The same lugs, by being wedged in over the deflector, will hold the valve to its seat. The cross-piece 18 may be soldered to the yoke 7 by fusible solder.

In Fig. 5 the cap is shown flattened out into a disk, and is made one with the deflector and valve. In this figure I have shown two soldered latch devices, 8, engaging under the inclined lip 19 of the adjustable seat 14 and soldered at 20 to the cap. There are two of these devices shown, one on each side; but one could be dispensed with, for the reason that when one of the devices 8 is sufficiently released the pressure in the pipe will throw the valve from its seat. The valve-seat may be of the flexible kind; or it may be made adjustable by a screw-thread, as shown.

In all of these different forms it will be noticed that the cap forms a protecting-shield over the heat-actuated device, so that the same will be protected from corrosive gases, dirt, or mechanical injury in the most perfect manner, and at the same time allowing the water when released by the valve to exert its pressure upon the extended surface of the cap, thereby insuring its prompt and complete removal.

Sprinklers have been heretofore constructed with protecting-caps; but these caps, when made air-tight, were always sealed by a soldered joint exposed more or less to the corrosive action of the atmosphere. I do not intend that my present claims shall cover such devices, as it is an essential feature of this invention that the soldered joint or other sensitive heat-actuated device be independent of the joint between the cap and its seat, the object being to completely protect such device from corrosion.

I claim—

1. In an automatic fire-extinguisher, the combination of the valve closing the water-passage with a protecting-cap fitted with an air-tight joint to the extinguisher-base, and a heat-actuated device independent of said joint located entirely within the cap and holding said cap to its seat until released by heat.

2. In an automatic fire-extinguisher, the combination of the valve closing the water-passage with a protecting-cap fitted with an air-tight joint to the extinguisher-base, and a heat-actuated device independent of said joint located in the space between the valve and cap, and secured to both valve and cap, so as to hold them to their respective seats until released by heat.

3. In an automatic fire-extinguisher, the combination of the valve closing the water-passage with a protecting-cap covering the valve, and inclosing a heat-actuated device adapted to hold the cap to its seat until released by heat, the said cap made partly of heat-conducting material and partly of heat-insulating material, and the said device secured to the heat-conducting part.

FREDERICK GRINNELL.

Witnesses:

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