

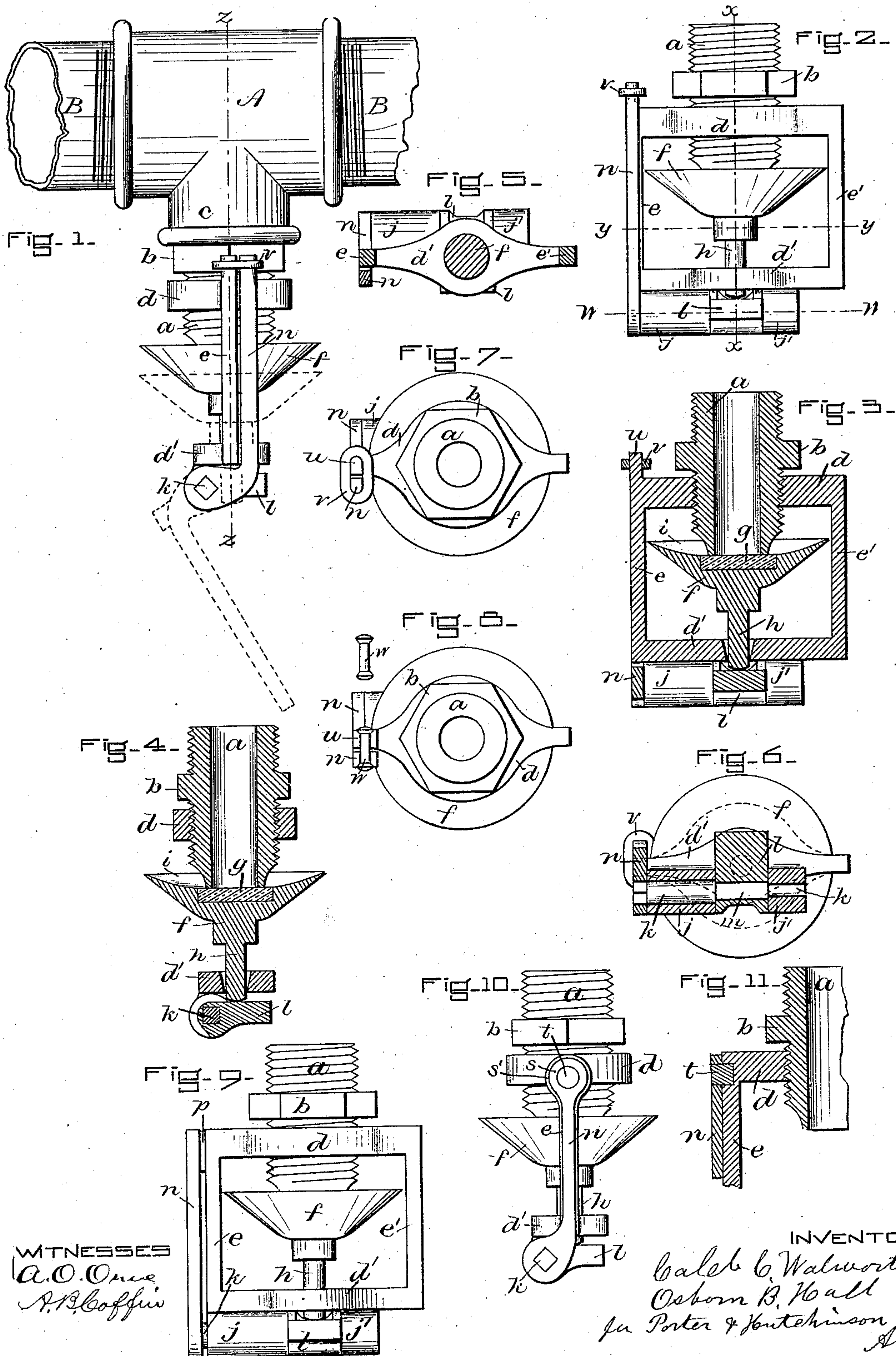
(No Model.)

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AUTOMATIC FIRE EXTINGUISHER.

No. 287,071.

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# UNITED STATES PATENT OFFICE.

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## AUTOMATIC FIRE-EXTINGUISHER.

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*To all whom it may concern:*

Be it known that we, CALEB C. WALWORTH, of Boston, in the county of Suffolk, and OSBORN B. HALL, of Malden, in the county of Middlesex, and State of Massachusetts, have invented a new and new useful Improvement in Automatic Fire-Extinguishers, which will, in connection with the accompanying drawings, be hereinafter fully described, and specifically defined in the appended claims.

This invention relates to that class of fire-extinguishers which are arranged in their operative positions in connection with a system of water-conducting pipes, and are habitually held closed and inoperative by means of fusible metal, whose melting-point is so low that, in case of fire, the extinguisher will be liberated and rendered operative before the fire shall have made material progress; and the invention consists in the construction and combination of the divers devices embodied therein, as hereinafter more particularly and fully set forth and claimed.

In the accompanying drawings, Figure 1 shows our extinguisher in elevation and attached to a T-coupling, which is interposed between two lengths of the water-pipe, sections of which are also shown. Fig. 2 is an elevation of our extinguisher, taken as viewed from the right in Fig. 1. Fig. 3 is a longitudinal vertical section of the same, taken as on line *z z*, Fig. 1, and as viewed from the right in that figure. Fig. 4 is a vertical section taken as on line *x x*, Fig. 2, and as viewed from the left in said figure. Fig. 5 is a sectional plan view, the section being taken as on line *y y*, Fig. 2, and showing in plan that part which is below said line. Fig. 6 is a sectional inverted plan view, the section being taken as on line *w w*, Fig. 2, and the view being as from below said line. Fig. 7 is a top plan view of the extinguisher shown in the preceding figures. Fig. 8 is a view like Fig. 7, except that it shows a modified form of the securing fusible metal. Fig. 9 is a view like Fig. 2, except that it shows the vertical arm as soldered to the supporting-frame. Fig. 10 shows our extinguisher as in Fig. 1, except in the modified method of securing the vertical arm by means of an insertible fusible pin or plug. Fig. 11 is a de-

tached section similar to Fig. 3, but showing the method of securing the vertical arm as in Fig. 10.

In said views, A represents a common T-coupling, in the respective ends of which are threaded the water-pipes B B. A composition nipple, *a*, formed with an angular collar, *b*, for manipulating it, is threaded in thimble *c* of coupling A. A rectangular supporting-frame, formed with upper bar, *d*, lower bar, *d'*, and side bars, *e e'*, is secured in place by its upper bar, the enlarged central portion of which is threaded upon the lower portion of said nipple *a*, so as to be vertically adjusted thereon. A valve, *f*, is arranged centrally in said frame, and is so held by its stem *h*, which is arranged to slide freely in a hole in the center of said lower bar, *d'*. A packing, *g*, seated centrally in valve *f*, serves as the seat against which the lower end or face of nipple *a* bears to form a water-tight joint when the extinguisher is adjusted for use. A circular rim, *i*, is formed upon valve *f*, which acts as a deflector of the water as it escapes from nipple *a* when the valve is released and falls, as will be explained. All said above-described devices are old, common, and well known.

For the purpose of holding valve *f* in a raised position to secure the engagement of packing *g* with nipple *a*, and also to release the valve to render the extinguisher operative, we have invented the following devices: A rock-shaft, *k*, is journaled to rotate freely in lugs *j j'*, formed upon the lower side of bar *d'*, and a short arm, *l*, having a square transverse passage to receive the square portion *m* of shaft *k*, is arranged between lugs *j j'*, and so as to be central to bar *d'*, said rock-shaft being so arranged that the prolongation of the axis of stem *h* would pass slightly to one side thereof. Upon the end of said shaft is secured a longer arm, *n*, at right angles to arm *l*, and so arranged that when the valve is to be secured by a removable link or pin, as will be described, said arm will, when raised, abut against vertical bar *e* of the frame, as shown in Figs. 1, 2, 3, 5, 6, 7, 8, and when so arranged a stud, *u*, is formed at the top of the frame, and a link, *v*, of fusible metal is placed over the upper part of arm *n* and said stud, as shown



in Figs. 1, 2, 3, 5, 7, thereby holding the arm in place and the valve raised against nipple *a* until the link gives away from the effect of heat at the intended temperature.

5 Instead of link *v*, which incloses stud *u* and arm *n*, a headed bar, *w*, may be employed, which would be seated in corresponding open slots formed in the upper parts of said arm and stud, as shown in Fig. 8. When arm *n* abuts  
10 against bar *e*, as shown in Fig. 1, it may be soldered thereto; but if it is to be soldered we prefer the construction shown in Figs. 9, 10, 11, where the arm is outside the bar, and may be secured by solder, as shown at *p*, Fig. 9;  
15 and when so constructed, instead of soldering, the arm may be secured in place by a plug of fusible metal, (shown at *t*,) which may be removed and replaced as desired, and which resists the pressure upon the valve by its  
20 shearing-strength.

It will be obvious that when arm *n* has been secured in place, adjacent to bar *e*, either by link *v* or by soldering the bar and link together, and the supporting-frame has been  
25 turned up on the nipple to the extent to produce the requisite pressure between the nipple and the valve-packing, the valve rests upon and is supported by short arm *l*, which latter is held in position by arm *n*, acting  
30 through the rock-shaft, and that when arm *n* is released by the giving way of the heated fusible metal which had confined it the pressure upon arm *l* will depress the same, and allow the valve to fall, the moving parts assuming the position shown by dotted lines in  
35 Fig. 1.

In order that the rock-shaft may be arranged as near the path of stem *h* as desired, the central part of the eye portion of arm *l* is cut  
40 away, as shown in Figs. 4, 5, 6, in order that it may not interfere with the free rising-and-falling motion of the valve and its stem *h*. Rock-shaft *k* and arms *l* *n* may be formed as an entire casting, or either of said arms may  
45 be formed as an integral part of the shaft, with the other arm removable; but we prefer the construction shown in that behalf. By arranging arm *n* adjacent and parallel to bar *e*, the two may, if desired, be soldered together  
50 at any point in the length of the arm, thereby producing any desired degree of sensitiveness in the action of the extinguisher, and when said arm is secured at its upper end by solder the difference between its length and that of  
55 arm *l* is such that when the solder gives way from the effect of heat arm *n* can move such distance before any material escape of water takes place that the arresting of arm *l* by the water cooling the solder is entirely ob-  
60 viated.

The fusible links employed to secure the long lever in place may be readily formed in molds, and of any desired strength, as the water-pressure may require. They may be  
65 kept in quantity always ready for use, and can be instantly applied or removed, and, if desired, as matter of extreme caution, may at

stated periods be replaced, and by their ready removal, and by slightly moving arm *n*, the valve may be tested in regard to the impor- 70  
tant question of whether it has adhered to the nipple, which test cannot be so surely performed by turning down the frame on the nipple, as in that event the valve, although ad- 75  
hering to the nipple, will be loosened therefrom by the very act of turning down the frame, when, if the solder-secured support of the valve had given way, it would not have  
80 been separated from the nipple by the water-pressure. Besides, the valves may be tested by removal of the links at any time, without the presence of a skilled person to resolder, as would be necessary if the valves were secured  
85 in that manner; and when link *v* is employed, as shown, it is an impossibility that the escaping water shall interfere with the effective working of the device, for the reason that  
90 water cannot escape until arm *n* has commenced to move, that such movement cannot take place till the link or bar is broken, and when broken it is impossible that its instan-  
95 taneous cooling could in any way impede the downward movement of arm *n*, and the consequent falling movement of the valve.

By arranging arm *n* to extend above the valve, and so as to be secured at its upper 95  
end, the danger of the solder being reset by the cooling action of water thereon, after the valve has partially opened, is obviated, as the water that escapes when the valve is but  
100 slightly opened falls downward, and hence cannot reach the solder above the valve, and before the water escapes with sufficient force to deflect it upward the liberation of arm *n* is  
105 fully effected.

It will be obvious that changes may be made in the details of construction of our inven-  
tion without departing from the spirit there-  
of, which latter consists, essentially, in arrang- 110  
ing a pivotal support at one side of the prolongation of the axis of the valve, with an arm on said pivotal support arranged to sus-  
tain the valve when closed, and an arm at one side of the valve to control the pivotal  
115 support, and extending up the side of the frame, and adapted to be secured in place by fusible metal.

We are aware that diversely-arranged levers for supporting the valve of fire-extinguishers, and secured in position by fusible metal, 120  
have heretofore been used; hence we do not claim the same in the abstract, but only as constructed and combined by us.

We claim as our invention—

1. In an automatic fire-extinguisher, the 125  
combination, with the supporting-frame and valve, of a rock-shaft or pivotal support arranged at one side of the vertical axis of the valve, a short arm arranged on said shaft to support the valve when closed, and a longer  
130 supporting-arm connected with said shaft, and arranged at the side of said frame, and to be thereto secured by fusible metal, substantially as specified.



2. In an automatic fire-extinguisher, a rock-shaft or pivotal support arranged in bearings on the lower horizontal bar of the supporting-frame, at one side of the axis of the valve, an arm on said shaft arranged beneath the valve to support the same, and a longer arm arranged on said shaft, and to be secured to the frame above the valve by fusible metal, substantially as specified.

3. In an automatic fire-extinguisher, the combination, with the valve and supporting-frame, of a rock-shaft or pivotal support arranged at one side of the vertical axis of the valve, an arm projecting from said shaft beneath the valve to support the same, a longer arm supported by said shaft and arranged at or near the side of the frame, and a projection or stud on the frame arranged to receive a fusible link to secure said longer arm thereto, whereby the valve is secured in position when closed, substantially as specified.

4. In an automatic fire-extinguisher, a rock-shaft or pivotal support arranged at right angles to the axis of the valve, and at one side thereof, a short arm projecting from said shaft to support the valve, and a longer arm sup-

ported by said shaft and arranged to be secured to the side of the frame by fusible metal at varying distances above the axis of the valve, whereby the sensitiveness of the valve may be varied as desired, substantially as specified.

5. In an automatic fire-extinguisher, the combination, with the valve, of a rock-shaft or pivotal support arranged at one side of the vertical axis of the valve, a short arm arranged on said shaft to support the valve when closed, and a longer arm arranged on said shaft at one side of the valve, and to be secured by fusible metal, substantially as specified.

6. In an automatic fire-extinguisher, the combination of nipple *a*, valve *f*, a supporting-frame, the rock-shaft or pivot *k*, its valve-supporting arm *l*, and retaining-arm *n*, arranged to be secured to the frame by fusible metal, substantially as specified.

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