(No Model.)

D. C. STILLSON & E. PRESCOTT.

AUTOMATIC FIRE EXTINGUISHER.

No. 357,692. Patented Feb. 15, 1887.

Fig. 2.

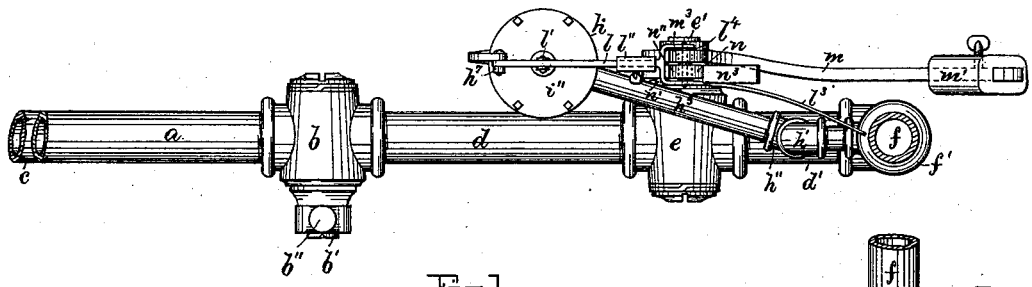
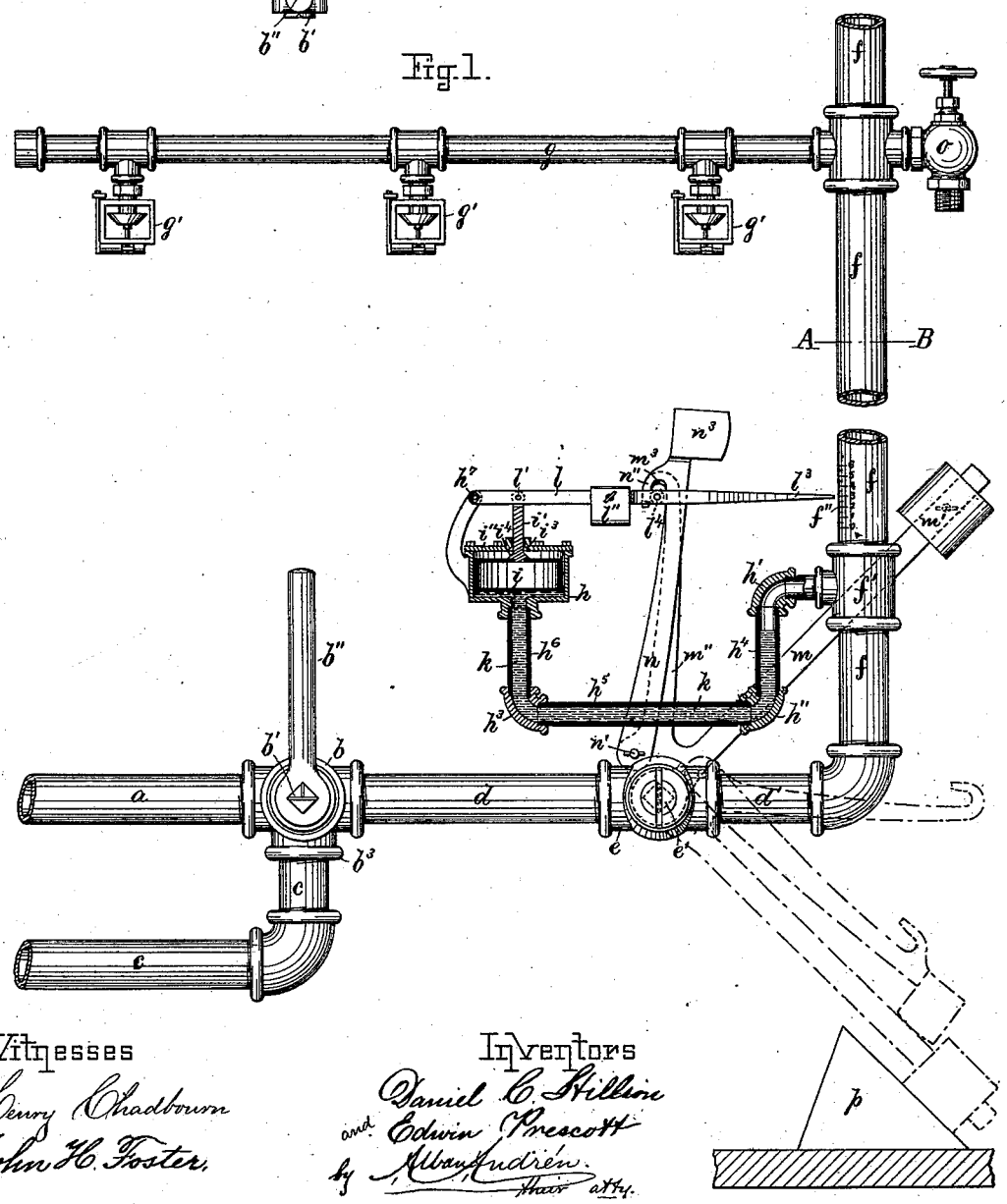


Fig. 1.



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UNITED STATES PATENT OFFICE.

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AUTOMATIC FIRE-EXTINGUISHER.

SPECIFICATION forming part of Letters Patent No. 357,692, dated February 15, 1887.

Application filed August 16, 1884. Serial No. 140,777. (No model.)

To all whom it may concern:

Be it known that we, DANIEL C. STILLSON, a citizen of the United States, residing at Somerville, in the county of Middlesex and State of Massachusetts, and EDWIN PRESCOTT, a citizen of the United States, residing at Arlington, in the State and county aforesaid, have jointly invented certain new and useful Improvements in Automatic Fire-Extinguishers; and we do hereby declare that the same are fully described in the following specification, and illustrated in the accompanying drawings.

This invention relates to that class of automatic fire-extinguishers in which plugs or water-valves or sprinklers are normally held against their seats on a system of pipes by means of fusible metal that will melt and liberate the sprinklers or plugs to permit the water to be forced out at such places when the heat in the room, in case of a fire, reaches the danger-point for which the sprinklers are arranged. In such class of fire-extinguishers it has been customary to arrange upon the main supply water-pipe a valve or cut-off, and to compress the air within the system of pipes between such main valve and the respective sprinklers when the apparatus is in its normal condition with the main valve and water-plugs closed, and to use, in connection with the compressed air within the system of pipes, a hydrostatic device and intermediate connecting mechanism to the main cut-off to cause the latter to be automatically opened when the compressed air in the system of pipes is liberated by melting of the fusible metal on the sprinklers, and thus cause the water to be forced out through them at the desired place or places. It is to this class of fire-extinguishers that our invention relates; and it is carried out as follows, reference being had to the accompanying drawings, where—

Figure 1 represents a sectional side elevation of the invention; and Fig. 2 represents a cross-section on the line A B, shown in Fig. 1.

Similar letters refer to similar parts, wherever they occur, on the different parts of the drawings.

a is the main water-supply pipe, leading from the main pipe in the street or other water-pressure source, as usual. Upon the pipe *a* is located the three-way cock *b*, having plug *b'* and handle *b''*, in the usual way of making such cocks. The cock *b* has a branch, b^3, connected to the waste-pipe *c*, as shown in Fig. 1.

To the delivery end of cock *b* is attached the pipe *d*, on which is located an ordinary cut-off or stop-cock, *e*, as shown. The latter, being provided with a pipe, *d'*, leading to the stand-pipe *f*, conducts the water to the system of sprinkler-pipes *g*, on which are located any of the usual kinds of automatic sprinklers, *g' g' g'*, which are held onto their respective seats by means of fusible metal in the well-known manner of constructing such automatic sprinklers.

f' is a T-branch on the stand-pipe *f*, connected by means of elbows *h' h''* h^3 and pipes h^4, h^5, and h^6, or in a similar or equivalent manner, to the box or case *h*, in which is located the float (or diaphragm) *i*, having stem *i'*, projecting through a perforation in the cover *i''*, the central lower side of which is made as a valve-seat, i^3, corresponding to the valve i^4 on the lower end of stem *i'*, so as to effect a close connection between said stem and its bearing when the float *i* is forced to its highest position within the case *h*. The space in the case *h* below float *i*, as well as the connecting-pipes and elbows *h'*, *h''*, h^3, h^4, h^5, and h^6, contains mercury *k*, or other suitable liquid, as shown in Fig. 1. At *h'* to the case *h* is jointed the end of weighted lever *l*, that is connected at *l'* to upper end of stem *i'*, and provided with an adjustable weight, *l''*, as shown. The opposite end of lever *l* is extended as an index-pointer, l^3, to indicate upon a graduated scale, *f'''*, the amount of pressure in pipe *f*.

e' is the movable plug in the cock *e*, and to the outer end of such plug is attached the weighted lever *m*, provided in its upper end with an adjustable weight, *m'*, as shown. In one piece with the weighted lever *m*, or otherwise firmly attached to it, is the hooked lever *m''*, having a hook or catch, m^3, in its upper end, adapted to hook on the pin or stud or projection l^4 on the lever *l*, as shown in Figs.

1 and 2. To the lower end of lever m'', or to any other desirable object, is hinged at n' the hammer-lever n, also provided with a hook, n'', to lock or hook on the pin l^4, as shown, such lever n having in its upper end a hammer or head, n^3, adapted to strike against the weighted lever m as soon as released from pin l^4, and thus to impart a shock or jar or blow on said lever m, and thus cause it, when released from projection l^4, to turn plug e' open even if the latter should happen to be stuck hard in its casing e.

To any suitable part of pipe f, or at any place above the stop-cock e, we attach a suitable stop-cock, o, to establish communication with such portion of the system of pipes and a suitable air-pump or other air-compressing device, (not, however, shown in the drawings.)

p is a suitable stop attached to the floor or any other stationary object, so as to limit the motion of lever m when released. As an equivalent for said stop, a chain or strap may be used, secured in one end to lever m and in the other end to some stationary object above it, or in a similar manner.

The operation of the invention is as follows: To set the apparatus after the system of pipes have been thoroughly drained, we close the cock e by turning its plug e', and with it the respective levers m m'' n, to the position shown in full lines in Fig. 1, and we now compress the air within the system of pipes between cock e and the sprinklers g' g' by means of an air-compressor attached to cock o until the pressure, acting on the liquid-piston k, causes the float i and the lever l to rise sufficiently for locking the pin l^4 on the latter in the hooks m^3 n'' on the respective levers m'' n, as shown in Figs. 1 and 2, after which the valve o is closed and the plug b' turned within cock b to the position shown in Fig. 1, so as to establish an open communication from the supply-pipe a to the pipe d, that leads to the now closed cock e. In case a fire occurs and one or more of the sprinklers g' should be opened automatically by the melting of their fusible metal holding devices, the compressed air within the pipe system will pass out through such opened sprinklers, and as the internal air-pressure within the system of pipes is lowered the liquid-piston k will fall in case h and the lever l will drop down by its own weight or that of the weight l'' and float i, until the pin l^4 is disengaged from the hooks n'' m^3 on the respective levers n and m'', causing the former to be disengaged a little in advance of the latter, and as the hammer-lever n is liberated it turns by its own gravity on its fulcrum n' until it reaches the also liberated weighted lever m, and if the latter has not already commenced to swing downward, and thereby turned the plug e' to an open position, then the hammer n^3 will hit against weight m' and cause the lever m to swing to the position shown in dotted lines in Fig. 1, in which position the cock e is open to permit the water forced through pipes a and d to pass through cock e, pipes f and g, to and out through the now open sprinklers g' g'. After a fire we drain the system of pipes by turning cock-plug b' one-fourth of a revolution, thereby shutting off the water-pressure from pipe a, and permitting the water in pipes g f d' d to drain off through waste-pipe c. We now reset the plug e and its levers, as aforesaid, and compress the air within the system of pipes, as before, until the levers n m'' are locked in position by the lever l and its pin l^4, after which the plug b' is turned to the open position shown in Fig. 1, and the device is now ready for automatic use in case of a fire.

Having thus fully described the nature, construction, and operation of our invention, we wish to secure by Letters Patent and claim—

1. In an automatic fire-extinguisher, the combination of a supply-pipe having a valve, a box or tank having a float arranged therein, a pipe connecting said supply pipe and tank, a weighted lever connected with the stem of the float and provided with a locking-pin, and hooked levers connected with the valve of the supply-pipe and adapted to engage the locking-pin of the float-lever, substantially as described.

2. In an automatic fire-extinguisher, the combination of a supply-pipe having a valve, a branch pipe provided with automatic sprinklers, a box or tank having a float inclosed therein, a branch pipe connecting said tank and supply-pipe, a piston contained in said branch pipe and tank, levers connecting the float and supply-pipe valve, and means for filling the supply-pipe with compressed air between said valve and sprinklers, substantially as described.

3. In an automatic fire-extinguisher, the combination, with a main supply-pipe having valves b e and a sprinkler-pipe having automatic sprinklers g' g', of the box or tank h, a branch pipe connecting said tank and supply-pipe, said branch pipe and tank containing liquid, a float, i, placed in the tank and having a stem, i', projecting through an opening in the tank-cover, the pivoted float-lever l, having weight l'', and locking-pin l^4, the lever m m'', connected with the valve e and provided with weight m', and a hook, m^3, to engage the pin of the float-lever, and the hammer-lever u, having head u^3 and provided with a hook, u'', for engaging said pin, substantially as described.

4. In an automatic fire-extinguisher, the combination of a main supply-pipe having valves b e and waste-pipe c, a sprinkler-pipe having automatic sprinklers g' g', the tank h, having a branch pipe connecting with the main supply-pipe, a float, i, placed in said tank and provided with weighted lever l, the weighted lever m m'', connected with the valve

e and adapted to engage the float-lever, and the hammer-lever *u*, also adapted to engage said float-lever, substantially as described.

5. In an automatic fire-extinguisher, the combination of the main supply-pipe having a valve, the tank having a float, and a branch pipe connecting with the supply-pipe, levers connecting the float and supply-pipe valve, and the lever locking and releasing mechanism, substantially as described.

In testimony whereof we have affixed our signatures in presence of two witnesses.

DANIEL C. STILLSON.
EDWIN PRESCOTT.

Witnesses:
ALBAN ANDRÉN,
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