(No Model.)

C. L. HORACK.

AUTOMATIC FIRE EXTINGUISHER.

No. 288,059. Patented Nov. 6, 1883.

FIG. 1.

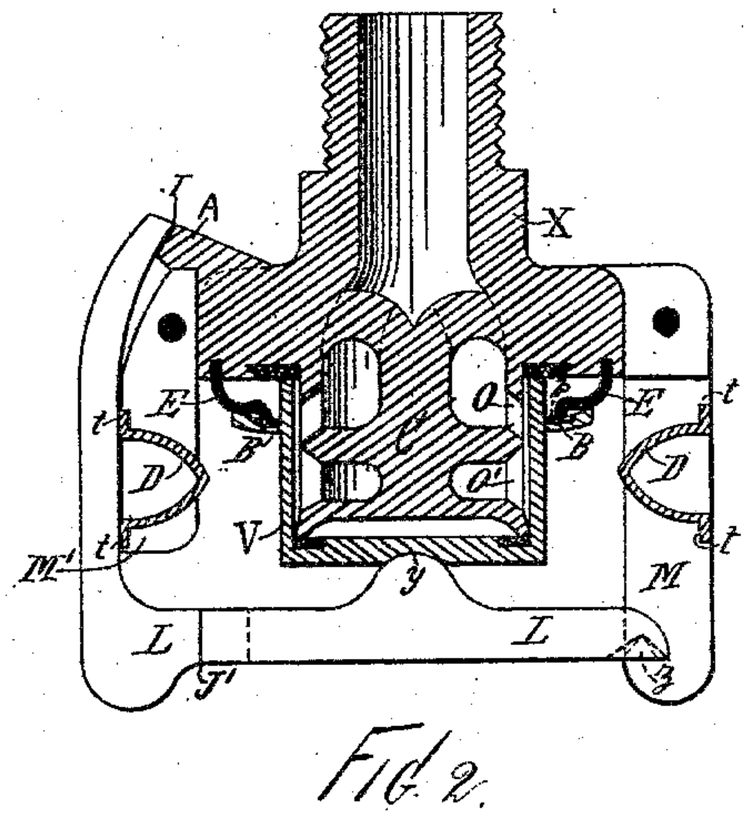


FIG. 2.

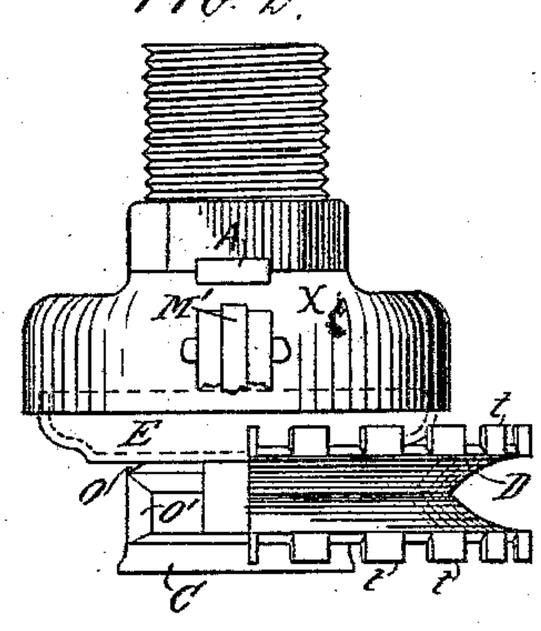
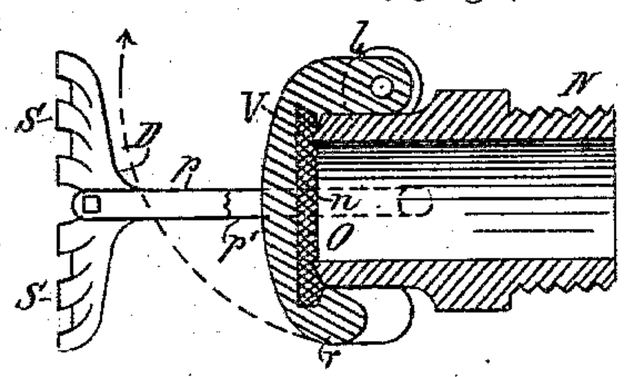


FIG. 3.



Witnesses.
John Buckler.
Rufus W. Williams

Inventor.
Chas. L. Horack

UNITED STATES PATENT OFFICE.

CHARLES L. HORACK, OF BROOKLYN, NEW YORK.

AUTOMATIC FIRE-EXTINGUISHER.

SPECIFICATION forming part of Letters Patent No. 288,059, dated November 6, 1883.

Application filed January 31, 1883. (No model.)

To all whom it may concern:

Be it known that I, CHARLES L. HORACK, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Automatic Fire-Extinguishers, of which the following is a specification.

The object of this invention is to construct an automatic fire-extinguisher having one or more outlets closed by a valve in such a manner that a soldered joint or a number of soldered joints be used to hold said valve in position until released by the heat of a fire, and that the extinguishing-fluid, when it begins to pass out of the distributer, be prevented from reaching the soldered joint or joints before at least one of them has been broken entirely, thereby liberating the valve. Another object of my invention is to provide a simple and effective distributer for the extinguishing-fluid by firmly fixing in front of the outlet or outlets a deflector, and by arranging on the face of this deflector suitable projections adapted to convert into a spray the stream or streams of water discharged upon it after the valve has been removed from its seat or seats. I attain these objects in the manner illustrated in the accompanying drawings, forming part of this specification.

Figure 1 represents a vertical section, and Fig. 2 a side elevation, of a device constructed according to my invention. Fig. 3 also represents a vertical section of a device showing some of the leading features of my invention.

In Fig. 1, V represents a cap-shaped valve placed over the outside of and surrounding a discharge-nozzle or distributer, C, which is shown to have in its outside walls two circular openings, passing around the same and arranged to produce intersecting streams. These openings are indicated by the letters O O'. The valve V is provided with two seats, one above and the other below the perforations, and it has rigidly attached to it a rim or collar, B, extending entirely around its circumference.

E is a flexible collar firmly attached to the casting X, which contains the nozzle or distributer C. Said flexible collar E should preferably be made of metal possessing spring power.

When the valve V is being forced to its seat the upper surface of the collar B, attached to it, is brought in contact with and made to fit the lower edge of the flexible collar E, and said flexible collar, or at least the elastic part of it, is made to spring upward, remaining, however, in close contact with the collar B, thereby forming a water-tight joint. A suitable packing, *p*, either of soft metal or of some other yielding substance—such as wax or paraffine—placed between the two collars C and B, might be employed to assist in making said joint tight.

M and M' are posts attached to the casting X. They serve to firmly hold in a position in front of the outlets the annular deflector D, which is rigidly attached to them. Said deflector D is shown to have a V-shaped cross-section, with projections or teeth *t t* on that part of its surface which is designed to deflect the water. These teeth serve to cut up into a spray the water discharged by the distributer. They are shown to be placed along the outer edges of the deflector, but might be placed on other parts of its surface and still answer a similar purpose.

Distributers have been constructed heretofore with a disk having a serrated rim, said disk being placed at right angles to the direction of the stream passing out of the discharge-nozzle, and the teeth simply offering deflecting-surfaces to the extinguishing fluid, after the same had already been deflected once by the smooth part of the disk forming the deflector. Under this arrangement some of the fluid discharged by the nozzle would not strike the teeth at all, and the remaining part would reach them only in a secondary manner. The quantity of the fluid thrown against the teeth, and the angle under which it would strike the same, would greatly depend upon the pressure applied to said fluid. This fact has been fully established by experience. These difficulties I overcome by constructing a discharge-nozzle with one or more lateral outlets, and locating the deflector in front of the same, so as to place the teeth or projections in such positions as to have the water passing out of the nozzle discharged against said teeth or stud shaped projections direct, in that manner procuring a more uniform distribution under different pressures.

Near the lower end of the post M a projec-

tion, *z*, is provided, which serves as a support for the free end of the lever L, a recess being provided in said lever to rest on said projection *z*. At Y said lever L is made to rest on the valve V, in order to hold it to its seat while the upper end of L is secured to the casting X at the point A, by means of a fusible solder-joint, J, or in any other manner so as to be relieved by the heat of a fire. The lever L is shown to also contain another such joint, at J′, and it will be seen that whenever either the joint J or the joint J′ breaks, owing to the heat of a fire, the valve, following its own weight, and also actuated by the pressure of the extinguishing fluid and the spring-power of the flexible-collar E, will leave its seat and will allow the extinguishing fluid to be discharged upon a fire after first striking the deflector D.

It is a common occurrence with automatic sprinklers provided with a valve for closing the outlets thereof that in case of a slow fire, as the temperature rises gradually, the solder used for confining the valve in its position begins to fuse, allowing the parts forming said joint to move along each other for a short distance without, however, separating entirely or breaking the joint. As a result, extinguishing fluid is allowed to escape between the valve and its seat, and by striking what remains of the soldered-joint to keep the same cool, thereby interrupting the fusing process and preventing the valve from becoming liberated entirely, thereby seriously crippling the device and keeping it from coming into full operation.

By providing the two collars E and B, resting upon each other, and making at least one of them flexible, and provided with spring-power, I prevent any such occurrence, particularly as far as the lower joint, J′, is concerned, for it will readily be seen that as the valve V, and with it the collar C, begins to move downward, the elastic collar B will closely follow the same, thereby maintaining, until its own elasticity and spring-power is exhausted, the water-tight joint mentioned above, and allowing the soldered joint J′ to be broken entirely, thereby overcoming the difficulty described above.

When the valve closing the outlet is adjusted to move downward, and where the casing containing the distributer extends sidewise beyond the valve-seat, as in this case, water escaping prematurely from the distributer will necessarily be discharged either sidewise or downward, but cannot reach the upper surface or the sides of the casing. Taking advantage of this fact I place the upper joint, J, in the position shown in Fig. 1, attaching the lever to the projection A on the casing X, thereby protecting it against any water that may escape from the distributer below it.

Fig. 2 shows a side view of the device after the lever and the valve V have dropped off, one-half of the deflector being shown on the right-hand side.

The details of the device might be varied. Only one discharge-opening or a series of openings might be provided in the discharge-nozzle. Of the two collars E or B, either one or both might be made elastic, in order to produce and maintain a water-tight joint between them, and also to assist in forcing the valve from its seat, and an additional and independent spring might be provided to assist in relieving the valve. The valve itself might be constructed in the form of a disk and with only one seat, and either the joint J or the joint J′ might be omitted, as in either case the remaining one, after being broken by the heat of a fire, would allow the valve to drop. The deflector instead of being of a V-shaped cross-section, might have any other suitable cross-section, and might be made either sloping toward the axis of the distributer, or at right angles to the same. It might also be made to contain perforations, allowing a part of the extinguishing fluid to pass through the same. For the lever L a device containing screw-threads for forcing the valve to its seat might be substituted.

Fig. 3 shows a vertical section of another device embodying some of the leading features of my invention. N is a nipple provided with screw-threads for attaching it to a system of piping. In front of the outlet O is placed a swinging valve, V, hinged to the lugs, of which only one (indicated by the letter *l*) appears in this section, and which are attached to the outer side of said nipple, and secured at *r* by means of fusible solder to another lug, *m*, attached to said nipple. *n* is a yielding packing provided for the purpose of securing a tight joint between the valve and its seat. The deflector D, provided with the teeth or projections S S, is fixed rigidly in front of said outlet by means of the posts *p p′*, which are attached firmly to the same, as well as to the outside of the nipple N, a sufficient space being left between valve and deflector to allow said valve to swing open fully, which in this case would be caused by the pressure of the extinguishing fluid exerted upon it, and to have the full stream discharged through the nozzle directed against the deflector D.

I claim as new and desire to secure by Letters Patent—

1. In a distributer for fluids provided with a discharge-nozzle having one or more outlets, a cap surrounding said discharge-nozzle and a stationary deflector placed around said cap and in front of said outlet or outlets, substantially as set forth.

2. In a distributer for fluids, the combination, with a discharge-nozzle constructed to discharge the fluid laterally, of an annular deflector placed around said nozzle and provided with a serrated rim, substantially as set forth.

3. In an automatic fire-extinguisher, the combination, with a discharge-nozzle, of a valve adjusted to move downward, and of a lever supporting the valve and transferring the pressure thereon to a joint to be broken by

the action of heat, the construction being such that said joint is placed above the valve-seat, substantially as set forth.

4. In an automatic fire-extinguisher, the combination, with a discharge-nozzle, of a valve adjusted to move downward, and of a lever held in position by a fusible joint, part of the casing containing the valve-seat being interposed between said joint and the distributer, substantially as set forth.

5. In an automatic fire-extinguisher, the combination, with a casing containing the valve-seat and provided with a collar, of a valve provided with a collar, the two collars being made to rest upon each other until the valve has been released by the heat of a fire, one of said collars being made flexible, substantially as set forth.

6. In an automatic fire-extinguisher, the combination, with a distributer, of a valve preventing the discharge of the extinguishing fluid until relieved by the action of heat, and a collar attached to the valve, and another attached to the casing containing the outlet, both collars being made to rest upon each other, substantially as set forth.

CHARLES L. HORACK.

Witnesses:
RUFUS M. WILLIAMS,
WALDORF H. PHILLIPS.