No. 624,611. Patented May 9, 1899.

W. H. BANKS.

AUTOMATIC FIRE EXTINGUISHER.

(Application filed Feb. 17, 1899.)

(No Model.) 2 Sheets—Sheet 1.

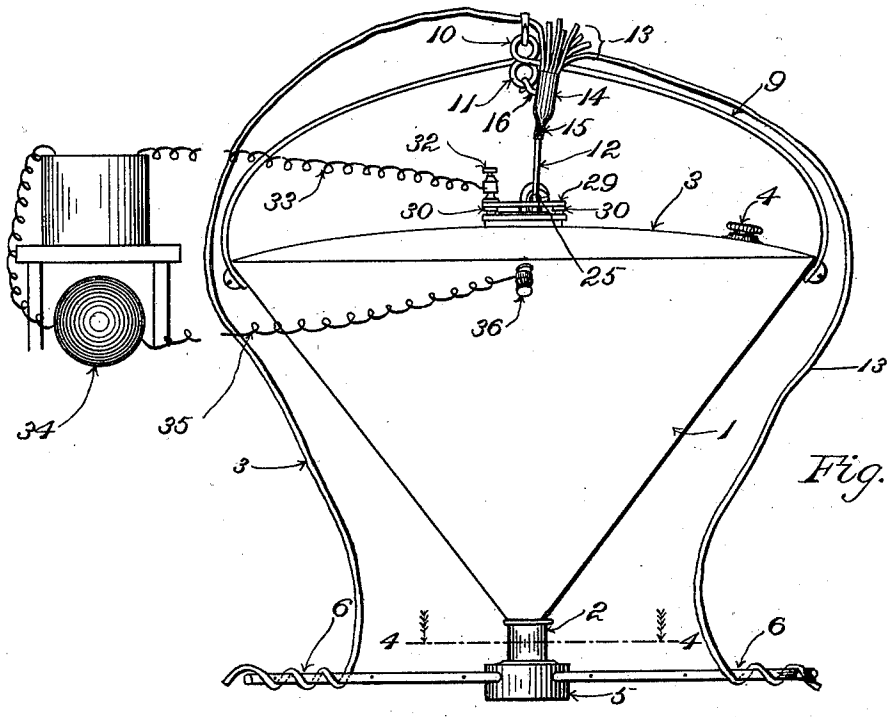


Fig. 1.

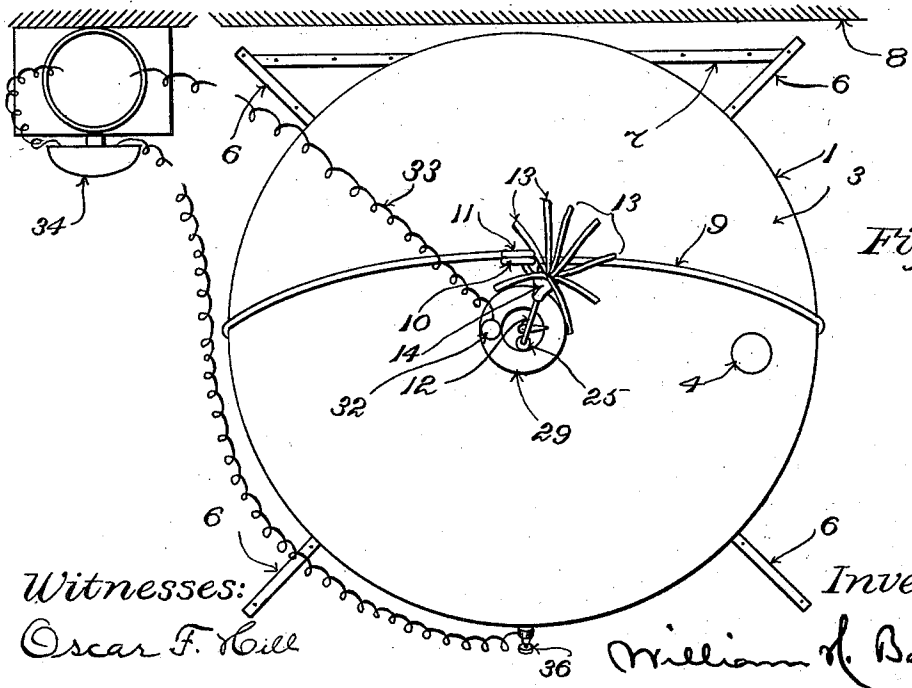


Fig. 2.

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(No Model.) 2 Sheets—Sheet 2.

Fig. 3.

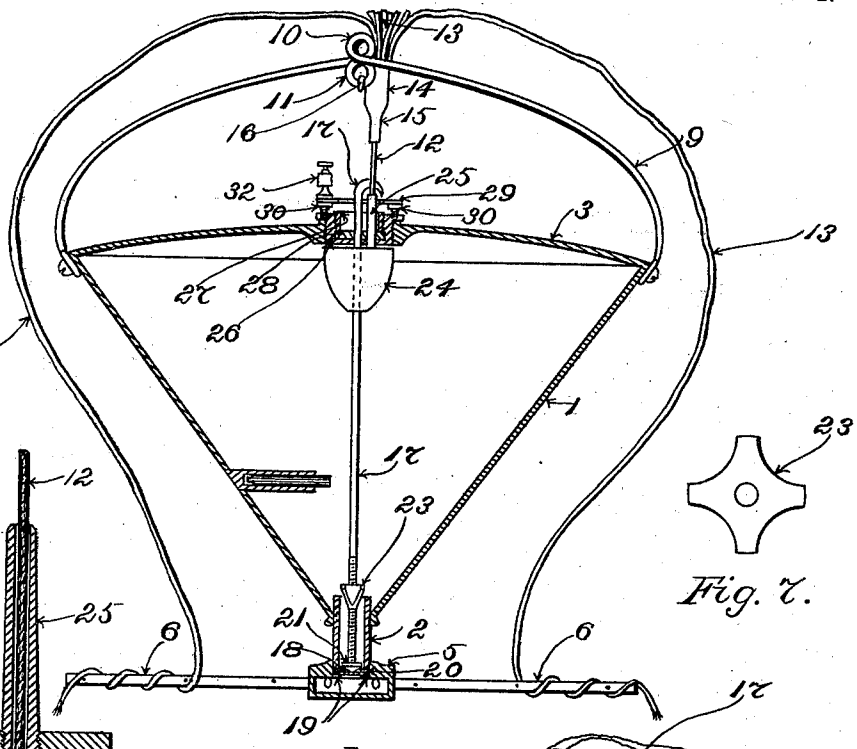


Fig. 7.

Fig. 6.

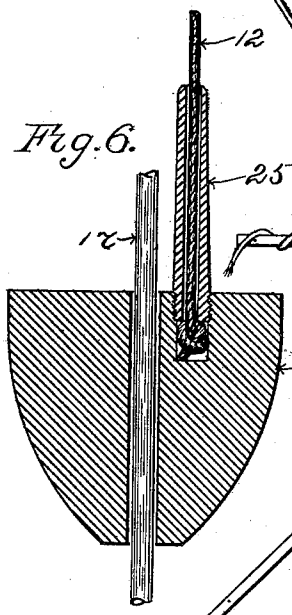


Fig. 5.

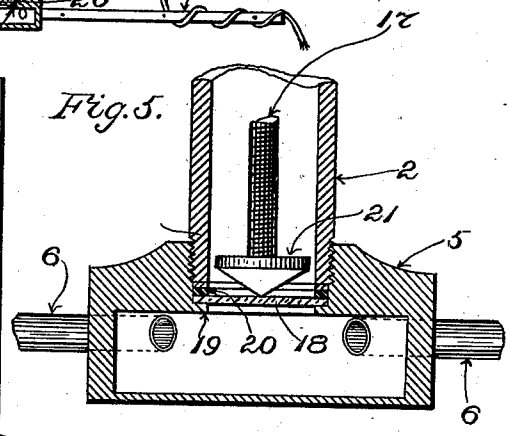


Fig. 4.

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UNITED STATES PATENT OFFICE.

WILLIAM H. BANKS, OF BOSTON, MASSACHUSETTS.

AUTOMATIC FIRE-EXTINGUISHER.

SPECIFICATION forming part of Letters Patent No. 624,611, dated May 9, 1899.

Application filed February 17, 1899. Serial No. 705,863. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. BANKS, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Automatic Fire-Extinguishers, of which the following is a specification, reference being had therein to the accompanying drawings.

The general aim of the invention is to provide an improved form of portable fire-extinguisher capable of being hung or suspended wherever combustible material or the like may render protection necessary.

A further aim of the invention is to provide an improved construction of the devices which in an automatic fire-extinguisher provide for occasioning the flow or discharge of the extinguishing fluid and the sounding of an alarm.

In the construction of automatic fire-extinguishers it is of the very highest importance to secure certainty of operation. This means that the contents of the extinguisher shall never fail to be discharged promptly and effectively upon the source of fire. It also means that the alarm which the extinguisher is arranged to give upon being actuated shall never fail to be given. It will be well understood that frequently a long time elapses between the placing of an extinguisher in its position or the setting of its working parts for use and the occurrence of a fire that actuates or should actuate it. During this time of disuse such working parts are likely to become set or rusted in their normal inoperative position and may in consequence fail to respond at the critical moment. Particularly is this true of the electrical connections in the forms of the same commonly employed as a part of the alarm referred to above. It is the design of my invention to provide devices for retaining and discharging the extinguishing liquid and for giving the necessary alarm which will not be subject to these disadvantages. To this end I have devised the improved devices which are presented in the accompanying drawings, explained in the following description, and defined with respect to their novel and patentable features in the claims at the close of this specification.

In the drawings, Figure 1 is a side elevation of my extinguisher. Fig. 2 is a plan thereof. Fig. 3 is a vertical cross-section thereof. Fig. 4 is a horizontal cross-section thereof on the plane indicated by the line 4 4 of Fig. 1 and looking downward or in the direction of the arrows adjacent to that line. Fig. 5 is a sectional view of the lower end of the extinguisher on an enlarged scale. Fig. 6 is a detail view in section, showing the movable weight, the means of attaching thereto its supporting-fuse, and part of its guide-rod. Fig. 7 is a view in plan of the centering-block that is applied to the lower portion of rod 17.

While the species of extinguisher to which my invention is especially applicable is that which is self-contained and portable, and while this is the form in connection with which I have herein shown it as embodied it is to be understood, however, that portions of the invention are not restricted thereto and may be employed separately or in other connections.

Referring to the drawings, 1 designates a receptacle that is designed to contain the extinguishing liquid. It preferably is of conical shape, its lower extremity terminating in a discharge mouth or pipe 2 and its top being provided with a cover 3, which preferably is permanently attached, and in which cover is a filling-hole that is provided with a cap 4, Fig. 2. To the lower end of the discharge-pipe 2 is attached a delivery-head 5, from which latter extend or radiate perforated hollow arms or pipes 6 6. These arms or pipes may be of any desired form, number, and arrangement. Some or all of these arms or pipes 6 6 may be connected together in pairs by means of a transversely-disposed perforated pipe like that herein designated 7, the same being supported by and fed from the said arms. The said pipe 7 is designed more especially for use in connection with a vertical wall or the like near which the extinguisher may be placed. In Fig. 2, for instance, 8 designates a wall adjacent to which the extinguisher is supposed to be located. The pipe 7 will be disposed parallel with the wall, and the effect of this position will be to wet down the wall in case of a fire in addition to the discharge of liquid from the arms 6 6 upon the burning material at or near the foot of the wall.

The receptacle 1 is provided with a bail 9,

in the middle of which are formed two eyes 10 11. The upper eye 10 is for the suspension of the extinguisher from a hook or the like. The lower eye 11 serves to sustain a combustible cord or fuse 12, which until burned away maintains the movable parts of the extinguisher in their operative position. 13 13 are a number of similar combustible cords or fuses leading from the extinguisher to material that the extinguisher is desired to protect and designed to have their free ends distributed through or over such material. These fuses or some of them may be led along the arms or pipes 6 6, which, as will be understood, will be of any desired length. The said fuses may be wrapped spirally around the said arms or pipes, as in Fig. 3, or otherwise connected therewith. Thereby a convenient support for the fuses on their way to the places which are to be protected is afforded. The action of these fuses 13 in communicating fire to the fuse 12 will be in general well understood. For connecting the fuses 12 and 13 together I employ a casing 14 or the like securing device. The fuse 12 passes through the casing 14 and, in fact, may be continued to constitute one of the fuses 13. The latter fuses enter the casing 14 and surround and make contact with the fuse 12, the casing 14 being compressed upon the bundle of fuses in such manner as to render certain the communication of fire to the fuse 12 from any one of the fuses 13. Below the confined ends of the fuses 13 the casing 14 is still further compressed upon the fuse 12, as at 15, so as to clamp the fuse 12 firmly and to resist the strain that is constantly exerted upon it. A hook 16, attached to the casing 14, engages the lower eye 11 of the bail 9 and sustains the fuse 12.

Having reference more especially to Figs. 3, 5, 6, and 7, 17 designates a vertical rod that is centrally located within the receptacle 1. The lower extremity of said rod is supported by a disk 18, that closes the discharge mouth or pipe 2, the said disk being confined between the end of the said discharge mouth or pipe and an annular shoulder 19 on the delivery-head 5, the two latter members being screwed together, as shown in Fig. 5. The disk 18 is made of a frangible material, preferably glass, and forms a seal for the contents of the receptacle, which seal is designed to be broken upon the application of sufficient force exerted downward on the rod 17. This seal may be secured by leading or by other known means in order to make it water-tight, and for the same purpose a washer of rubber or the like (designated 20, Fig. 5) may be employed. The lower portion of the rod 17 is threaded for the reception of an internally-threaded conical block 21, the point of which rests upon the frangible seal 18. When rod 17 is forced downward, the point or tip of the cone 21 readily breaks and penetrates the central unsupported portion of seal 18, while the outer portions of the cone act to carry down and clear away projecting pieces of the shattered seal 18 in the descent of the rod, and thereby to leave the passage of full size for the discharge of the extinguishing liquid to and through the arms 6 6. Upon the threaded portion of the rod 17 is also adjusted a spider or open-work block 23, (shown separately in Fig. 7,) which is designed to guide the lower end of the rod and retain it centrally in the discharge mouth or pipe 2 through the contact of its arms with the interior of said discharge mouth or pipe. The rod 17 is driven downward at the proper moment by the fall of a weight 24, which slides upon it and which normally is sustained in an elevated position by the fuse 12. The weight is provided with an upwardly-projecting tubular pin 25, Fig. 6, through which the lower portion of the fuse 12 is passed, the end of the fuse below the pin being knotted, as shown, to keep it from pulling out of the pin. This pin is screwed into a hole that is tapped in the top of the weight 24. When the weight descends, upon the parting of the fuse, it gathers impetus and strikes the spider 23. The rod 17 is thereby driven downward and punched through the seal 18, and the liquid is allowed to escape.

The cover 3 has a threaded hole through its center, into which is screwed the cup-shaped filling-piece 26, which latter in turn has its interior face threaded to receive the annular washer 27. The said washer confines a disk 28, of felt or the like, between itself and the floor or bottom of the cup. Through registering holes in the said felt disk and cup the pin 25 and rod 17 are passed, the felt fitting snugly around them, so as to exclude access of air to the receptacle and to prevent the evaporation of liquid that would ensue if a circulation of air were permitted to occur. At the same time the felt does not impede the motion of either the pin or the rod. The upper end of the rod is bent into hook form, with the end downward, the said end preferably being pointed. So long as the extinguisher remains inoperative this end or point is sustained above and out of contact with a metal plate 29. The latter is made fast upon the flat heads of two or more screws 30 30, made of hard rubber or other insulating material and screwed into the top 3 of the receptacle 1. The metal plate 29 is provided with a binding-post 32, from which leads one wire 33 of an electric circuit, in which circuit an alarm-bell 34 is placed. The other wire 35 is attached to a second binding-post 36 upon the receptacle 1. As will be obvious, the rod 17 is in electrical connection with the receptacle. The rod, therefore, and the plate 29 form the terminals of a normally-broken electrical circuit; and the said rod is caused to make contact with the said plate and to actuate the alarm with absolute certainty by the descent of the rod 17 and the forcible striking of its hooked upper extremity onto the upper surface of the plate. Thus at the same time that

the seal is broken and the extinguishing fluid within the receptacle is permitted to discharge the alarm is sounded.

In some cases in order to secure additional force in the discharge of the fluid from the receptacle a vial or the like, as at 34, and containing sulfuric acid (or other substance suitable for the purpose) is arranged to be broken by the descent of the weight 17 and to discharge its contents into the receptacle, which will contain a solution of bicarbonate of soda, (or other suitable substance.) In the present case the said vial is introduced from the outside through a tube or pocket 33, its inner end projecting into the path of the weight 24 in its descent.

What I claim is—

1. In an automatic fire-extinguisher, the combination of a portable receptacle having means to distribute the extinguishing fluid, and a frangible seal controlling the discharge therefrom, a plunger to break the seal, a weight to operate the plunger by impact, and a fuse by which the weight normally is held suspended in an elevated position, and which is arranged to be burned away upon the occurence of a fire and to then allow the weight to descend and operate the plunger to cause the breakage of the seal, substantially as described.

2. In an automatic fire-extinguisher, the combination of a frangible seal controlling the discharge therefrom, a plunger-rod to break the seal, a weight to slide upon the plunger-rod and operate the same by impact, a stop on the said rod to receive the blow of the weight, a fuse by which the weight normally is held suspended in an elevated position, and which is arranged to be burned away upon the occurrence of a fire so as to then allow the weight to descend to operate the plunger-rod and cause the breakage of the seal, substantially as described.

3. In an automatic fire-extinguisher, the combination of a portable receptacle having means to distribute the extinguishing fluid, and a frangible seal controlling the discharge therefrom, a plunger to break the seal, a weight to operate the plunger by impact, a stop on the plunger for receiving the blow of the weight, a fuse for normally suspending the weight in an elevated position, an insulated plate, and an electric circuit including an alarm and having the said plate and plunger as its terminals, whereby when the fuse is burned away the fall of the weight will cause the seal to be broken and also cause the said circuit to be completed and the said alarm to be actuated, substantially as described.

4. In an automatic fire-extinguisher, the combination of a frangible seal to control the discharge therefrom, a plunger-rod to break the seal and provided with a contact-making projection, a weight to operate the plunger by impact against a stop on the said plunger-rod, a fuse for suspending the weight in an elevated position, an insulated plate, and an electric circuit including an alarm and having the said plate and plunger as its terminals, whereby when the fuse is burned away the fall of the weight will cause the seal to be broken and also cause the said circuit to be completed and the alarm to be actuated, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM H. BANKS.

Witnesses:

CHAS. F. RANDALL,

WILLIAM A. COPELAND.