Chemical Sprinkler Unit

Inventors
Orville E. Current & Arthur J. Earl
By Bair, Freeman & Sinclair
Attorneys
Our invention relates to a chemical sprinkler unit particularly adapted for use in extinguishing fires.

It is the purpose of our invention to provide such a sprinkler unit of very simple and inexpensive construction, having an outside container provided with sprinkler holes near its bottom so located that the fluid may be distributed over a considerable area for thereby applying it directly to the fire.

Another purpose is to provide an outer container of the kind mentioned and a fragile receptacle on the inside of the outer container arranged to be struck by a breaker in case of excessive heat. We preferably supply a screen in the outer container above the holes for the purpose of catching the particles of the broken fragile receptacle and thus preventing the scattering of the glass and the like in the room and also for preventing the clogging of the holes.

Another purpose is to provide a novel heat fusible device for holding a spring-tensioned breaker in inoperative position and adapted to release the breaker in case of excessive heat.

With these and other objects in view, our invention consists in the construction, arrangement and combination of the various parts of our unit, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in our claims, and illustrated in the accompanying drawing, in which:

Figure 1 is a perspective view illustrating the arrangement of our chemical sprinkler units in a room.

Figure 2 is a vertical, sectional view through the unit.

Figure 3 is a horizontal, sectional view taken on the line 3—3 of Figure 2; and

Figure 4 is a detailed, perspective view of the heat fusible device.

In the accompanying drawing, we have used the reference numeral 10 to indicate generally the ceiling of a room or the like. It may be mentioned at this time that our unit may be fastened with its upper end snugly against the ceiling or may be hung from the ceiling or from a bracket or in certain cases may be inset into the ceiling with only the portion of the unit having the sprinkler holes projecting downwardly from the ceiling.

Our unit includes an outer container 12 which may be of any desired material and of any shape suitable for the purpose.

While we have shown a substantially cylindrical container, we desire it to be understood that this container may be given various artistic shapes where that is desired, and may even be used in combination with the ordinary electric light.

As here shown, the container 12 is open at the top and is provided near the top with an outwardly projecting flange portion 18 terminating in an upwardly projecting annular flange 11.

In the drawing, we have illustrated one way in which the container may be secured to the ceiling. This is simply illustrative and any other suitable way may be employed.

We have shown in the drawing, a bar 14, which may be fastened to the ceiling by means of a screw 16. The bar 14 has at its ends the down-turned flanges 14a.

Where this type of hanger is used, we preferably set into the upper end of the container an annular disc 18, the edge of which rests on the flange 10a and which forms a closure to keep out dirt and the like. The flange 11 may then be fastened to the down-turned flanges 14a by means of suitable screws 17. These may be readily inserted for installation or removed for detaching and servicing the unit.

At the bottom of the container 12, it is provided with a narrow in-turned horizontal flange-like portion 18a at the inner end of which is a down-turned annular flange 20. At the bottom of the flange 20 is an in-turned narrow flange 21 and from the inner edge of that, there extends downwardly an annular flange 21a at the lower edge of which is a disc-like bottom 22.

The whole bottom portion of the container may be formed by stamping or drawing and is thus shaped with two offsets as illustrated in Figure 2.

In the flange 21a substantially above the bottom member 22 and in the flange 20, we provide a series of sprinkler holes 23, which are of such size that when the contents of the fragile receptacle, hereinafter more particularly referred to, are discharged into the bottom of the container, the fluid will squirt out through the holes 23 and be discharged in spreading streams as indicated at 24 in Figure 1.

We may and preferably do provide a few small holes 22a in the bottom 22. These afford drainage.

It will be noted that the holes 23 are far enough above the bottom, so that if in the course of time, there should accumulate a layer of dirt on the bottom 22, it would not interfere with the discharge of the fluid through the lower row of holes 23.

In the upper part of the container 12 is the
fragile chemical fluid container 43, which will be again referred to.

For breaking this container, we provide a breaker, which includes the strip of spring metal 24, which in the particular form of the device here shown is fastened to the wall of the container 12 by means of a washer or the like 25 and bolts or rivets 28. The member 26 extends upwardly and is out-turned in order to serve as a means for preventing the breaking of the spring at the bolt or rivet.

When the device is installed for use, the spring strip 24 is tensioned considerably and is bent over and downwardly to the opposite side of the container. On the free end of the strip 24 is the breaker point 30.

For holding the breaker and the spring strip 24 in the tensioned inoperative position, we provide the following means:

As shown in Figures 2 and 4, the member 32 which may be a piece of copper wire has the end 34 turned at right angles to overhang the spring 24, as shown in Figure 2. The wire 32 extends downwardly through the screen 46 hereinafter referred to and through a suitable hole provided therefore in the flange 21. The lower projecting end of the wire 32 is soldered by means of fusible solder 32a to a small metal arrow point or the like 38, which in the installed device engages the under side of the flange 21 and prevents the breaker from operating.

In assembling the device, the wire 32 and the breaker portion 34 may be inserted through the hole in the flange 21 and through the screen 46 and through an elongated slot 38 in the spring 24. Thereupon the wire 32 is rotated until the member 34 stands in the position shown in Figure 3.

The fusible metal 32a is such that when subjected to the heat of the fire or equal to that of a fire, it melts, whereupon the spring 24 will snap the breaker 30 against the fusible receptacle 40 and break it.

For supporting the receptacle 40 any suitable means may be employed. We have here illustrated a wire ring 44 from which legs 46 extend downwardly and rest on the flange 18. The receptacle 40 may be made of glass or any material that will be readily breakable by the apparatus and which will not be injured or deteriorated by the chemical contained therein.

In the actual use of these units, the parts are assembled as shown for instance in Figure 2. The chemical is hermetically sealed in the receptacle 40 and is in fluid form so that when a certain temperature is reached in the room, the fusible metal 32a will melt and permit the breaker to smash the receptacle 40, whereupon the contents of the receptacle will drop to the bottom of the container 12.

One advantage in the reduced size of the bottom of the container rises from the fact that the fluid will stand at a greater height therein, so that the pressure of gravity will be sufficient to discharge the fine streams of chemical for a considerable distance.

By regulating the size and shapes and capacity of the parts, the degree of this spread can be varied to a very considerable extent, as may be desired.

Thus we have produced a chemical sprinkler unit, which is positive and certain in action, wholly automatic, operating without the aid of human hands.

It will be understood from what has already been said that many changes may be made in the materials used and in the shape, construction and arrangement of the parts of our improved unit, and it is our intention to cover by our claims any such changes or modifications which may be within the scope of our invention and of our claims.

We claim as our invention:

1. In a chemical sprinkler unit, a container having a plurality of portions of successively reduced diameter at its lower end formed with a sprinkler 10 holes in its sides, spaced above the bottom of the container, a fragile receptacle for fluid in the upper part of the container, a spring-tensioned breaker associated with the sprinkler and supported on the interior of the container, adapted when released to break the receptacle and permit its contents to discharge into the lower part of the container and to squirt out through the sprinkler holes, and means for holding the breaker in spring-tensioned position, comprising a member slidably projected through the wall of the container and having a portion on the interior for holding the breaker in tensioned position and having on the exterior of the container a member for preventing inward movement of said slideable member and having a fusible means for connecting said last described member with the slideable member.

2. In a chemical sprinkler unit, the combination of a bracket adapted to be secured to a ceiling and having down turned flanges at its ends, a container having at its upper end an outturned annular flange, a removable cover seated therein and an upturned annular flange receiving the flanges of the bracket and adapted to be secured thereto and thus adapted to be supported on a ceiling, having sprinkler holes near but above its bottom, a fragile receptacle for fluid in the upper part of the container, a breaker associated with the unit, spring-tensioned in inoperative position, and adapted when released to snap to position to break the receptacle so that the contents thereof will drop to the bottom of the container and be discharged through the sprinkler holes, and heat releasable means for holding the breaker in tensioned position.

3. In a chemical sprinkler unit, a container having sprinkler holes in its lower part, a fragile receptacle in the upper part of the container, a spring breaker secured at one end to the interior of the container, said spring having an elongated slot near its free end, means for holding the spring breaker in tension position, comprising a rod-like member extended through said slot, and having a right-angled extension for engaging a spring, said rod-like member being projected through the container wall, a stop adjacent the rod-like member outside the container, and heat fusible material connecting the stop and the outer end of the rod-like member.

4. In a chemical sprinkler unit, a container having an inset removable top, an annular flange projecting above the top, a supporting bracket adapted to be secured to a ceiling of a room having portions received within said flange, means for detachably connecting the flange with the bracket whereby the container can be mounted on a ceiling with the flange snugly engaging the ceiling and thus preventing the admittance of dirt into the container and yet permitting the ready disassembly of the container from the bracket and removal of the top for recharging the container, said container having a plurality of openings in its lower end for discharging a fire extinguishing chemical, a fragile container for
chemical received within the first container and means for breaking the frangible container when a given temperature is reached in the vicinity of the device.

5. In a chemical sprinkler unit, a container having portions at its lower end successively reduced in diameter and provided with discharge openings in their side walls, a frangible receptacle in the upper part of the container, a spring tensioned breaker in the lower part of the container below the frangible receptacle and adapted when released from tension to effect discharge of the contents of the receptacle, means for holding the breaker in tensioned position including an element slidably mounted in the wall of the container at the bottom thereof and projecting alongside one of the reduced portions within the circumferential outline of the main portion of the container, a catch and fusible means for connecting the catch to such projecting portion, said projecting portion and catch being arranged so that they do not project below the lowermost part of the container and are thus protected from accidental injury.

6. In a chemical sprinkler unit, a container having portions at its lower end successively reduced in diameter and provided with discharge openings in their side walls, a frangible receptacle in the upper part of the container, a spring tensioned breaker in the lower part of the container below the frangible receptacle and adapted when released from tension to effect discharge of the contents of the receptacle, a screen resting on the bottom of the container above the first reduced portion thereof, means for holding the breaker in tensioned position and for releasing it under certain conditions including a member slidably extending through and guided by said screen and the bottom of the uppermost reduced portion, a catch on the lower projecting end of said member and fusible material connecting said catch and said member.

7. In a chemical sprinkler unit, an outer container having discharge perforations in its lower end, a frangible spherical receptacle within the upper part of the outer container, a spring breaker having one end secured to the wall of the container on the interior thereof near the bottom of the container and being curved to clear the receptacle when released from tension and having a breaker head at its free end adapted to strike and break the frangible receptacle when the breaker is released and temperature sensitive means comprising a hook extending from the breaker and through the container for holding the breaker in tensioned position and a retainer secured to said hook exteriorly of said container by fusible material and adapted to become inoperative as a retainer when subjected to a given temperature.

8. In a chemical sprinkler unit, a container, a supporting bracket adapted to be screwed to the ceiling of a room, having portions received within the upper end of said container, a top for said container, means for detachably connecting the upper end of the container to the portions of said bracket within said container, whereby the container can be mounted on a ceiling with the upper end thereof snugly engaging the ceiling and thus preventing the admission of dirt into the container and yet permitting the ready disassembly of the container from the bracket and removal of said top for recharging the container, said container having a plurality of openings in its lower end for discharging a fire extinguishing chemical, a frangible container for chemical received within the first container and means for breaking the frangible container when a given temperature is reached in the vicinity of the device.

9. In a chemical sprinkler unit, a container having sprinkler holes in its lower part, a frangible receptacle in the upper part of the container, a swingable opening device for said receptacle mounted at one end on the interior of the container, said opening device having an elongated slot near its free end, means for holding the opening device in tensioned position comprising a rod-like member extending through said slot and having a right angled extension for engaging said opening device, said rod-like member being projected through the container wall, a stop adjacent the rod-like member outside the container and heat fusible material connecting the stop and the outer end of the rod-like member.

10. In a chemical sprinkler unit, a container provided with discharge openings, a frangible receptacle in the container, a spring tensioned breaker adapted when released from tension to effect discharge of the contents of the receptacle, means for holding the breaker in tensioned position including an element slidably mounted in the wall of the container at the bottom thereof within the circumferential outline of the container, a catch, fusible means for connecting said catch to such projecting portion and a protecting projection on said container, said projecting portion and catch being arranged so that they do not project below the lowermost part of said protecting projection and are thus protected from accidental injury.

11. In a chemical sprinkler unit, a container having its lower end provided with discharge openings, a frangible receptacle in the upper part of the container, a spring tensioned breaker in the lower part of the container below the frangible receptacle and adapted when released from tension to effect discharge of the contents of the receptacle, a screen above the bottom of said container, means for holding the breaker in tensioned position and for releasing it under certain conditions including a member slidably extending through and guided by said screen and the bottom of said container, a catch on the lower projecting end of said member and fusible material connecting said catch with said member.