

Fig. 2

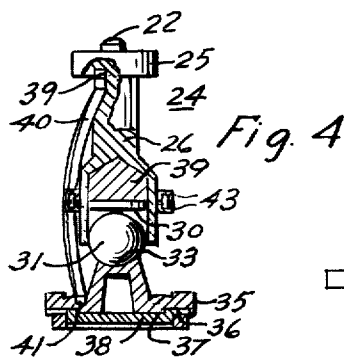


Fig. 4

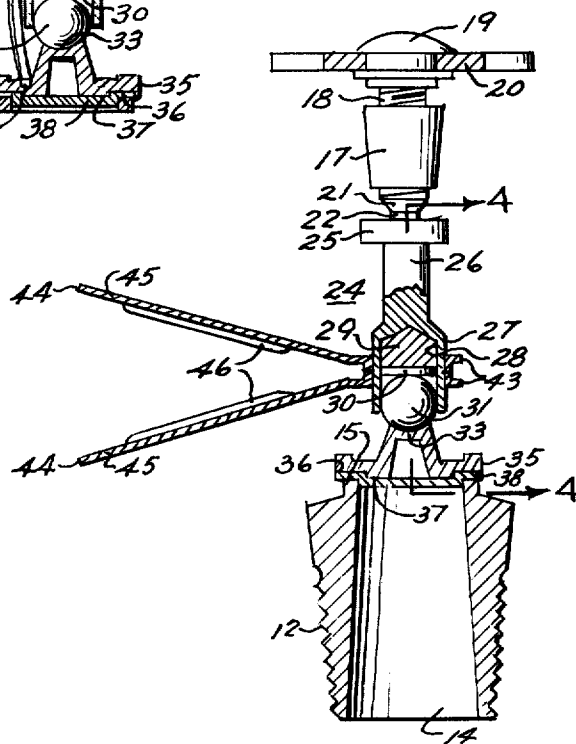


Fig. 3

SPRINKLER

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to a sprinkler of the actuator arm and strut type in which the strut has a retaining tube containing a heat responsive alloy element, a disk and a ball engaged with and preventing lever and seat closure cap release, until predetermined temperatures are attained.

2. Description of the Prior Art

Sprinklers for water discharge have been in use for many years and a considerable number of different designs have been used. When working with higher water pressures which provide better dispersion of the water and therefore greater fire suppressant effect the eutectic alloys used as heat-sensitive links do not usually operate as quickly as desired.

In my prior U.S. Pat. No. 3,625,289 a sprinkler is shown which is satisfactory. It is desired, however, to decrease the time required for operation and the sprinkler of the present invention has been ascertained to reduce the time required for operation to about half that required for my prior sprinkler, and over a wide range of temperatures.

SUMMARY OF THE INVENTION

In accordance with the invention, a sprinkler is provided having a seat closure cap held in closed position by actuator arms which are retained in position by a temperature sensitive strut which includes a ball and a pellet of heat sensitive material contained in a tube which pellet collapses when a predetermined temperature is reached, permits the ball to move inwardly and releases the actuator arms and closure cap to permit water to be discharged from the sprinkler. Strut carried fins are provided which increase the speed of response.

It is the principal object of the invention to provide a sprinkler having an actuator arm and strut assembly that is used with high water pressure and wherein there is a rapid release.

It is a further object of the invention to provide a sprinkler which is simple and inexpensive to construct but sturdy and reliable in operation.

It is a further object of the invention to provide simple but effective structure for reducing the lag in the operation of a sprinkler.

Other objects and advantageous features of the invention will be apparent from the description and claims.

BRIEF DESCRIPTION OF THE DRAWINGS

The nature and characteristic features of the invention will be more readily understood from the following description taken in connection with the accompanying drawings forming part thereof, in which:

FIG. 1 is a top plan view of a preferred embodiment of a sprinkler in accordance with the invention;

FIG. 2 is a side elevational view of the sprinkler shown in FIG. 1;

FIG. 3 is a central sectional view taken approximately on the line 3—3 of FIG. 2; and

FIG. 4 is a fragmentary sectional view taken approximately on the line 4—4 of FIG. 3.

It should, of course, be understood that the description and drawings herein are illustrative merely and that various modifications and changes can be made in

the structure disclosed without departing from the spirit of the invention.

Like numerals refer to like parts throughout the several views.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now more particularly to the drawings, and FIGS. 1 to 4 thereof, a preferred embodiment of the sprinkler 10 is therein illustrated as having a frame 11. The frame 11 has an externally threaded base 12 which has a tapered vertical bore 14 and valve seat 15.

The base 12 is of generally cylindrical configuration and has a pair of opposed arms 16 integral therewith which extend outwardly and upwardly until they converge and are connected to a crosshead 17. A compression screw 18 is in threaded engagement in the crosshead 17 and has a head 19 thereon and carries a baffle plate 20. The screw 18 has an internally spherical terminal end 21 which has engaged therein the spherical terminal 22 of a temperature responsive strut 24. The strut 24 has a cylindrical collar 25 from which a stem 26 extends downwardly to tubular portion 27 with a hollow interior or cavity 28 for the reception of a pellet 29 or eutectic fusible alloy of well known type and which may have melting temperatures of 135° F., 165° F., 212° F., 286° F., 360° F., or other melting temperature as desired. A disc 30 retains the pellet 29 in cavity 28 and distributes the load from a ball 31 which bears against the disc 30 and is seated in a recess 33 in a closure cap 35.

The closure cap 35 has a bottom face 36 and downwardly extending rim 37 which engage a metallic seating disc 38 of copper or the like so as to be soft but non-corrosive. The disc 38 is seated on the valve seat 15.

The collar 25 has engaged therein, in spaced openings 39 at locations on a chord offset to one side of the center line of the strut 24 as shown in FIGS. 2 and 4, the upper ends of bowed actuator arms 40. The lower ends of the arms 40 are engaged in openings 41 in the closure cap 35 also on a chord offset from the center line of the strut 24.

The strut 24 and arms 40 normally retain the closure cap 35 in closing position on the valve seat 15, the compressive force applied on strut 24 and onto the closure cap 35 being adjustable by turning the screw 18.

The strut 24, and preferably on the exterior of the tubular portion 27 and exteriorly of the pellet 29, has the mounting collars 43 of strut fins 44 in engagement therewith. The fins 44 include plate portions 45 with stiffening ribs 46 impressed thereon. The fins 44 are preferably made of sheet copper or other good heat conductive material. The fins 44 are preferably tilted respectively upwardly and downwardly as shown in FIG. 3.

The mode of operation will now be pointed out.

When the temperature in the vicinity of valve 10 is reached which is the melting temperature of the pellet 29, the pellet collapses. The ball 31 moves into cavity 28 and the strut 24, due to pressure from screw 18 collapses and falls out and the collapse causes arms 40 to also fall out thereby releasing the closure cap 35 which also falls away. Water from the bore 14 moves upwardly, past the seat 15, strikes the baffle plate 20 and is distributed over the nearby area below.

The fins 44, by reason of their effectiveness for heat transfer speed up the melting of the pellet 29, so that

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water for fire extinguishing action is made available in a shorter time interval when the ambient temperature calls for opening of the sprinkler valve 10.

I claim:

- 1. A sprinkler which comprises
a frame, 5
a deflector carried on said frame,
said frame having a portion with a hollow bore terminating at a valve seat,
a closure cap for said valve seat, and 10
means including a strut having a portion of eutectic alloy with a predetermined melting temperature normally holding said closure cap seated on said valve seat, and
means mounted on said strut for transmitting heat to 15
said strut including outwardly extending fins.
- 2. A sprinkler as defined in claim 1 in which said strut is vertically disposed and actuator arms are provided engaged with said strut and said closure cap. 20
- 3. A sprinkler as defined in claim 1 in which said last mentioned means includes mounting collars

from which said fins extend.

- 4. A sprinkler as defined in claim 3 in which said strut has a tubular portion within which said portion of eutectic alloy is disposed, and said mounting collars are mounted on the exterior of said tubular portion.
- 5. A sprinkler as defined in claim 1 in which said means for normally holding said closure cap seated has an adjusting screw in engagement with a portion thereof for determining the pressure of said closure cap on said valve seat.
- 6. A sprinkler as defined in claim 1 in which said frame has a cross head in spaced relation to said valve seat, and
a screw is in threaded engagement with said cross head and is in engagement with a portion of said strut, and
said screw determines the force applied by said closure cap on said seat.
- 7. A sprinkler as defined in claim 6 in which said deflector is carried on said screw.

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