

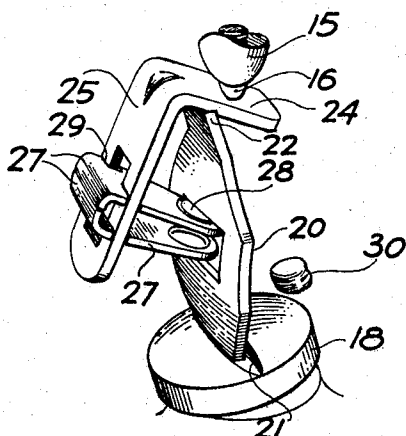
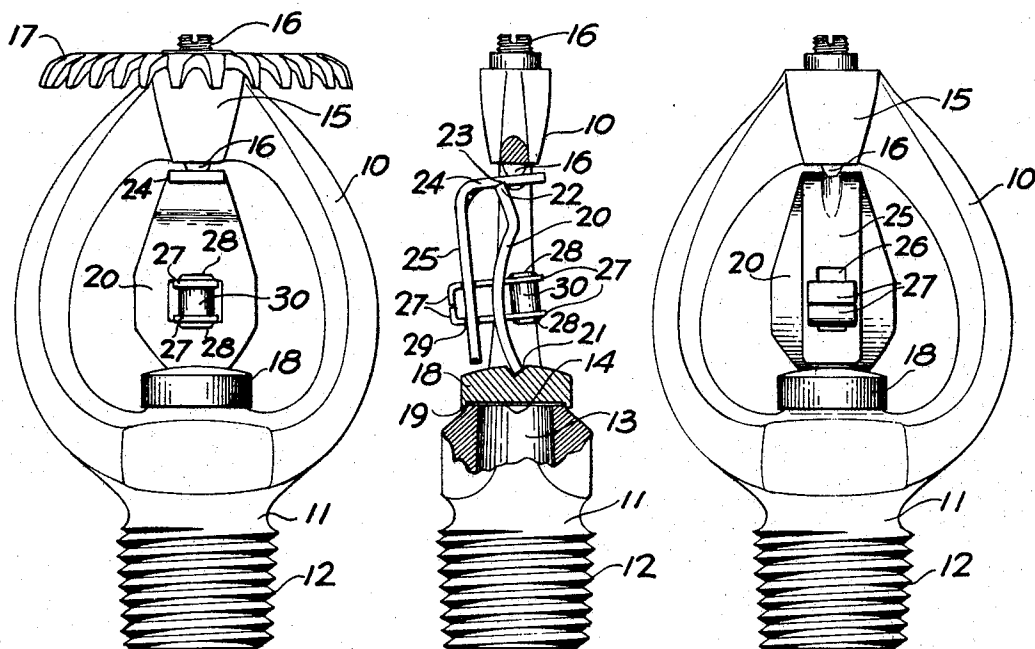
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T. VORKAPICH

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CENTER STRUT SPRINKLER ASSEMBLY

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INVENTOR.
Theodore Vorkapich
BY
W. J. B. Harpman
ATTORNEY.

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CENTER STRUT SPRINKLER ASSEMBLY

Theodore Vorkapich, Campbell, Ohio, assignor to
"Automatic" Sprinkler Corporation of America,
Cleveland, Ohio, a corporation of Ohio

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ABSTRACT OF THE DISCLOSURE

A fire extinguishing sprinkler including a frame having a discharge orifice and a deflector spaced with respect thereto, a cap on said discharge orifice and levers positioned between said frame and said cap and a pair of spaced sears engaging openings in said levers so as to hold said levers in assembly, said sears normally held in spaced relation by a fusible element.

The principal object of the invention is the provision of a fire extinguishing sprinkler utilizing a center strut controlled closure, the principal operating parts of which are positioned close to the axial center line of the fire extinguishing sprinkler.

A further object of the invention is the provision of a fire extinguishing sprinkler having a novel lever and fusible element arrangement normally closing a discharge orifice in the sprinkler.

A still further object of the invention is the provision of a fire extinguishing sprinkler incorporating a simple, efficient and positively operating valve means, normally closing the discharge orifice in the sprinkler, and movable to free said discharge orifice upon reaching a predetermined temperature.

Fire extinguishing sprinklers heretofore known in the art have used many and various devices for holding the discharge orifice closed at normal temperatures and acting to open the discharge orifice at predetermined increased temperatures. Most of the devices used for temporarily closing the discharge orifice have comprised opposed levers extending outwardly of the sprinkler in angular relation and secured in fixed position at their outermost end by a fusible metal link, which is usually formed of two pieces of metal soldered together with a heat melting solder.

The construction and assembly of fire extinguishing sprinkler with these conventional levers is an exacting and painstaking operation. Other fire extinguishing sprinklers have been provided with a frangible glass or quartz bulb filled with a readily vaporizable liquid having the capability of breaking the bulb upon a predetermined temperature vaporizing the contents. These several devices of the prior art must be carefully made to close tolerances, and even more carefully assembled into sprinklers in order to be operable.

The present invention discloses an improvement in the means holding the discharge orifice closed by substituting a simple assembly of levers engaged at one end on a cap on the discharge orifice, and at their other end, on a compression pin in the frame of the fire extinguishing sprinkler. The levers are so arranged that one of the levers engages the other off center and they are provided with a heat releasable fastener normally holding the assembly in desired cap engaging relation.

The principal point of novelty in the present disclosure is in the formation of the heat releasable fastener, which is formed of a pair of simple metal parts arranged in oppositely disposed relation and positioned through apertures in the levers and held in spaced lever engaging relation by a fusible element in compression. The arrange-

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ment of the metal parts termed sears herein and the fusible element is such that upon the fusing of the fusible element at a predetermined temperature, the sears move toward one another and are thereby capable of passing through the aperture in one of the levers, thus, freeing the levers and permitting the fire extinguishing sprinkler to open.

The construction is easy to form, of simple parts, and equally easy to assemble and it possesses the ability of falling free of the fire extinguishing sprinkler once the fusible element reaches its flow point, at its predetermined temperature. The operation is unfailing due to the tensioning of the levers and their normal biasing of the sears, which biasing action is overcome only as long as the fusible element remains solid.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed.

The invention is illustrated in the accompanying drawing, wherein:

FIGURE 1 is a front plan view of a fire extinguishing sprinkler incorporating the improved lever and heat releasable fastener assembly.

FIGURE 2 is a side elevation of the fire extinguishing sprinkler seen in FIGURE 1 with parts broken away.

FIGURE 3 is a back elevation of the fire extinguishing sprinkler seen in FIGURE 1.

FIGURE 4 is an exploded perspective view of the fire extinguishing sprinkler illustrating the operation of the same upon fusing of the heat releasable fastener.

By referring to the drawing and FIGURES 1, 2 and 3 in particular, it will be seen that the fire extinguishing sprinkler comprises a sprinkler frame 10 having a base portion 11 exteriorly threaded as at 12 and defining a vertical passageway 13 axially thereof, the upper end of which forms a discharge orifice 14. The upper central portion of the frame 10 is enlarged as at 15, and is centrally apertured to receive a compression pin 16. A deflector 17 is positioned on the upper end of the frame 10. The discharge orifice 14 is normally closed by a cap 18 together with a gasket 19 thereunder, as seen in FIGURE 2 of the drawings and the cap 18 is held in closed position on the discharge orifice 14 by a lever and heat releasable fastener assembly.

The lever and heat releasable fastener assembly comprises a primary lever 20, which stands vertically in a groove 21 in the cap 18 and extends to a point adjacent the lower end of the compression pin 16. The primary lever 20 has a rectangular opening 21 formed therein on the vertical center line thereof, and the primary lever 20 is bowed longitudinally throughout approximately three-fourths of its length with a reverse bend inwardly from its upper end. The upper end of the primary lever as indicated in the drawings by the numeral 22 is positioned at one side of the axial center line of the sprinkler and in engagement with a secondary groove 23 formed in the lower surface of the horizontal section 24 of an inverted L-shaped secondary lever 25. The secondary lever 25 has a rectangular opening 26 in its lower central section on the longitudinal center line thereof and in horizontal registry with the opening 21 in the primary lever 20. The rectangular opening 26 in the secondary lever 25 is positioned so that its greatest length is longitudinally of the vertical portion of the secondary lever 25. The horizontal portion 24 of the secondary lever 25 is provided with a depression on its uppermost surface for receiving the lower most end of the compression pin 16 and it will, thus, be seen that when the primary and secondary levers 20 and 25 are positioned in the assembly, as best illustrated in FIGURE 2 of the drawings,

they must be held in assembled relation by a fastener engaging the openings 21 and 26 respectively. The fastener employed for this purpose comprises a pair of opposed metal sears 27, each of which is an elongated semi-L-shaped metal stamping with a cup like configuration 28 adjacent one of its ends and having oppositely disposed inwardly extending slots 29 in the side thereof inwardly from its opposite end.

In order that the sears may be positioned in fastening relation, as seen in FIGURES 1, 2 and 3 of the drawings, they are assembled with their flanged ends in engaging relation and the cup shaped configurations 28 in oppositely disposed relation. The sears are then moved through the openings 21 and 26 in the primary and secondary levers 20 and 25 until the slots 29 in the sears line up with the secondary lever 25, whereupon the sears are rotated a quarter turn bringing the slots 29 into registry with the secondary lever 25, as best seen in FIGURE 2 of the drawings. In such position the width of the flanged ends of the sears 27 is greater than the width of the rectangular opening 26, and the sears 27 are, thus, positioned in holding relation relative thereto. The opposite end portions of the sears 27, having the oppositely disposed cup shaped configurations 28 formed therein, are then moved apart and a fusible element 30 inserted therebetween. When this occurs, the projecting cup shaped configurations 28 formed in the sears 27 are respectively positioned above and below the horizontal edges of the opening 21 in the primary lever 20, thus, preventing the sears 27 from moving therethrough. The sides of the configurations 28 are angular.

In the assembling of the fire extinguishing sprinkler incorporating the novel lever and heat releasable fastener as disclosed herein, the assembly of the levers and the heat releasable fastener formed of the sears and the fusible element is then tensioned by moving the compression pin 16 downwardly, as will be understood by those skilled in the art. When sufficient tension has been exerted on the horizontal portion 24 of the secondary lever 25, the tension is transmitted downwardly through the bowed primary lever 20 and against the cap 18 which thereby effectively closes the discharge orifice 14 of the sprinkler.

By referring now to FIGURE 4 of the drawing, it will be seen that upon fusing of the fusible element 30, which occurs at a predetermined temperature, the sears 27 have been permitted to move toward one another as urged by the biasing action of the primary and secondary levers 20 and 22, which are biased away from one another by the tension exerted through the compression pin 16, as hereinbefore described. When the sears 27 move toward one another, they are then in a position permitting them to move through the opening 21 and they immediately do so, as urged by the secondary lever 25. The primary lever 20 is thus freed which in turn permits the

cap 18 to move away from the discharge orifice 13, and, thus, permits the fire extinguishing fluid to flow through the passageway 13 of the fire extinguishing sprinkler and vertically where it will strike the deflector 17 and be directed in the pattern desired.

It will thus be seen that a relatively simple inexpensive and highly efficient lever and heat releasable fastening means has been disclosed, which are particularly suitable in their environment. They have no projecting portions extending outwardly of the sprinkler, which may be accidentally damaged and the arrangement of the levers, with respect to the axial center line of the sprinkler, is such that they readily move out of the way upon fusing of the fusible element in the heat releasable fastener, all as hereinbefore described.

It will thus be seen that a center strut fire extinguishing sprinkler assembly has been disclosed, which meets the several objects of the invention and having thus described my invention what I claim is:

1. A fire extinguishing sprinkler having a frame locating a discharge orifice and a deflector spaced relative thereto, a cap normally closing said discharge orifice and a strut-like assembly of levers positioned between said cap and said sprinkler frame, a heat releasable fastening device including a pair of sears having configurations normally engaged in openings in said levers and a fusible element normally spacing said sears apart so as to hold said levers in said strut-like assembly.

2. The fire extinguishing sprinkler set forth in claim 1 and wherein said configurations in said pair of sears include notches in the sides thereof, opposed engaging flanges on one of the ends of each of said sears and opposed cup shaped areas adjacent the other end of each of said sears.

3. The fire extinguishing sprinkler set forth in claim 1 and wherein said strut-like assembly of levers consists of a primary lever standing vertically and having one end engaging said cap, said primary lever having a longitudinal bow therein throughout a majority of its length and terminating inwardly from its upper end and a secondary lever of inverted L-shaped configuration, the horizontal portion of which is positioned between the upper end of said primary lever and said sprinkler frame, with the vertical portion in spaced relation to said primary lever, said openings being in the vertical portions of said levers and in alignment with one another.

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M. HENSON WOOD, Jr., Primary Examiner

MICHAEL Y. MAR, Assistant Examiner