FIRE EXTINGUISHING SYSTEMS

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5 Claims. (Cl. 169—42)

This invention relates to improvements in fire extinguishing systems of the type in which a weight is connected to a thermo plastic line, one end of which is affixed to a stationary point adapted to fall structurally on heating to a predetermined temperature to release the weight.

The object of the invention is to provide a chemical blanket if a fire occurs to prevent the access of air to the fire and also water damage by providing an insulation layer between the fire and any secondary fire extinguishing systems such as an automatic sprinkler or similar device.

A further object of the invention is to provide a second weight to operate the extinguisher on the rupture of the line by heat, the falling of the first weight suspended on the line separating two arms supporting the second weight to allow the weight to fall in a predetermined path to engage the extinguisher; the second weight may be greater than the first weight in order that the first weight may be reduced and thereby enabling a line of minimum diameter and therefore quickly ruptured by an increase in heat to be employed.

The invention comprises a fire extinguishing system of the type referred to in which a second weight is suspended from arms on a bracket, the arms being arranged to be separated to release the second weight by a snatch cord or chain actuated by the release of the first weight on the rupture of the line.

The invention will be described with reference to the accompanying drawings:

FIG. 1 is a perspective view of one form of the invention showing a thermo-plastic line arranged over a machine.

FIG. 2 is a side elevation of a further form of the mechanism for actuating an extinguisher.

FIG. 3 is a diagrammatic side elevation of a further arrangement of the thermo-plastic line.

FIG. 4 is a diagrammatic side elevation of a further arrangement.

FIG. 5 is an enlarged detail view of part of FIG. 4 for operating an extinguisher.

A fire detecting line A (FIG. 1) of a thermostatic material such as polyvinyl chloride is secured at one end to a stationary support a such as a wall or part of a machine frame and is traversed over pulleys a2 mounted on a machine above any position where from experience it is known that a fire is liable to start. The line A continues over further pulleys a3 and a weight W is attached to the free end.

A slack chain or cable d is secured to the weight W and the other end to one arm d5 of a supporting bracket D5. A second arm d6 upon which the arm d7 is pivoted is connected to the bracket D5. The end of the arm d2 interlocks with one arm of a link d5 also pivoted on the arm d2 which is normally kept in engagement with the arm d2 to support a second weight W1. The link d5 is kept in engagement with the arm d2 by a spring d4.

On the falling of the weight W due to severance of the line A the chain or cable d tightens and snatches the arm d6 downwards to release the end of the link d5 therefrom whereupon the weight W falls in a tube b arranged to project into a container B for a fire extinguisher C the discharge nozzle c of which is positioned to direct a spray onto and above the part of the machine where a fire is likely to occur.

The fire extinguisher C is of the type which is operated by a blow on a plunger C1. On the occurrence of a fire in the machine the initial heat melts the thermo plastic line A and thereby allows the weight W to fall to release the second weight to actuate the extinguisher C which emits a blanket or layer of dry or wet chemical cloud or other media onto and above the fire and thereby prevents the access of air thereto and the fire is smothered.

FIG. 2 shows an alternative arrangement employing a fire extinguisher actuated by an instantaneous blow of the second weight W1. The weight W1 after release drops onto the plunger C1 which is formed with an inclined surface to deflect the weight W1 after striking into a chute b1 along which it travels thereby allowing the plunger C1 to rise again to operate the extinguisher without any danger of degassing a pressurized type of extinguisher.

The protection given by this arrangement of line A may be referred to as phase 1 protection.

In the arrangement shown in FIG. 3 the line A is arranged above a machine or machines and is carried on or inside stands or posts D adjustable in height and is protected from accidental damage by angle members D2 supported on the stands D. Transverse pins may extend between the arms of the members at intervals to retain the line therein. One end of the line A is secured to a wall or to an anchor on a guard or carrier or part of a machine and the free end is attached to a weight W1 which on falling releases the second weight as previously described.

The protection given by the foregoing arrangement may be referred to as phase 2.

To provide a phase 3 protection as shown in FIGS. 4 and 5 the line A secured at one end passes over a plurality of pulleys a5 and passes to and fro to provide a festooned network adjacent the ceiling a6 of the room to be protected so that if a fire occurs anywhere in the room heat therefrom will melt a portion of line to allow the weight W to fall to release the weight W1.

In order to actuate a plurality of extinguishers and to set off an alarm or to close doors or the like the second weight W1 falls in a tube b1 to tip or rock a lever d6 mounted on a pivoted arm d5 movement of which controls one or more extinguishers and actuates an alarm. The weight W1 may be released manually by movement of the lever d5 for testing the apparatus or if a fire is thought to be imminent.

Any chemical fire extinguisher may be employed such as those containing liquid chlorodichloromethane or a chemical powder such as sodium bicarbonate with easy flowing and water repellent additives, or other fire extinguishing powders as sold by fire extinguisher manufacturers for use in chemical fire extinguishers.

The discharge nozzle or nozzles of the extinguisher(s) is/are preferably mounted for movement through a predetermined angle by a cam (not shown) mounted on a spindle to rotate the nozzle against the action of a spring so that the discharge from the nozzle or nozzles is sprayed over a predetermined arc above the fire.

The discharge from the nozzle forms a chemical blanket or layer over the fire and prevents the access of air thereto, thereby subduing and quenching the fire. This layer or blanket is also of a heat-insulating nature which prevents heat from the fire rising to set off any secondary fire extinguishing apparatus such as a sprinkler system unless the fire is so fierce that the heat therefrom penetrates the layer or blanket.

The discharge from the extinguisher may pass along a pipeline to one or more discharge heads arranged above
or below the machines to provide a blanketing layer both above and below the fire and over or under adjacent machines or materials to prevent the fire from spreading thereto.

The motion may be given to the nozzle by a counter balance weight and a supported dead weight which is released by the rupture of the line. A second nozzle may be provided to spray the layer or blanket to the underside of the machine or machines or materials or the nozzle may be rotated by clockwork or electric motor.

What I claim is:

1. An actuating device for a fire extinguisher and an extinguishing system of the type comprising a suspended weight, a thermoplastic line, a stationary point to which one end of the line is attached, a plurality of pulleys over which the line passes in a zig-zag configuration the other end of the line being affixed to and supporting the weight, a slack cable also affixed by one end to the weight, a pivoted arm to which the other end of the cable is affixed, a second arm to which the pivoted arm is connected and a link interlocking the two arms, a second weight suspended in the link and adapted to be released by the falling of the first weight on the rupture of the line by heat to operate the fire extinguisher mounted therebelow.

2. A fire extinguishing system as in claim 2 in which the second weight is mounted in a tube to guide the weight onto the extinguisher.

3. A fire extinguishing system as in claim 2 in which an angle member protects the line from damage.

4. A fire extinguishing system as in claim 2 in which the line is suspended on posts and passes to and fro to provide a festoon above the space to be protected.

References Cited by the Examiner
UNITED STATES PATENTS
466,801 1/92 Reinemann.
758,362 4/02 Hicks -------------------- 169—26
2,585,039 2/52 Rooke ----------------- 169—26 X
2,675,707 4/54 Brown ------------------ 169—42 X
M. HENSON WOOD, Jr., Primary Examiner.