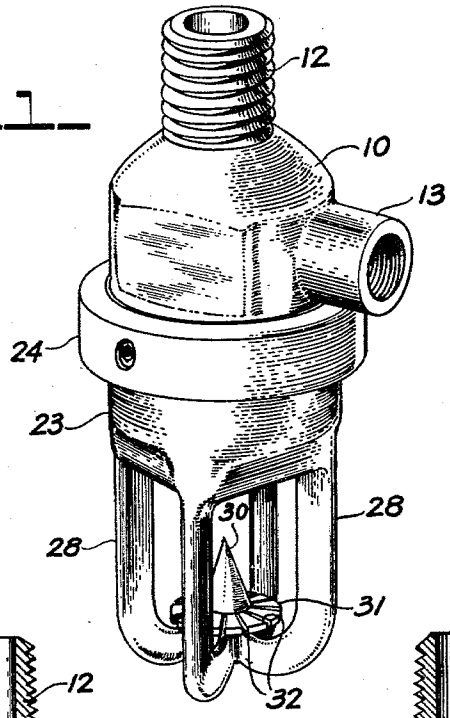
April 13, 1965 J. R. THORSON 3,178,119

PILOT OPERATED SPRINKLER VALVE AND SPRAY HEAD

Filed Oct. 11, 1963

FIG. 1



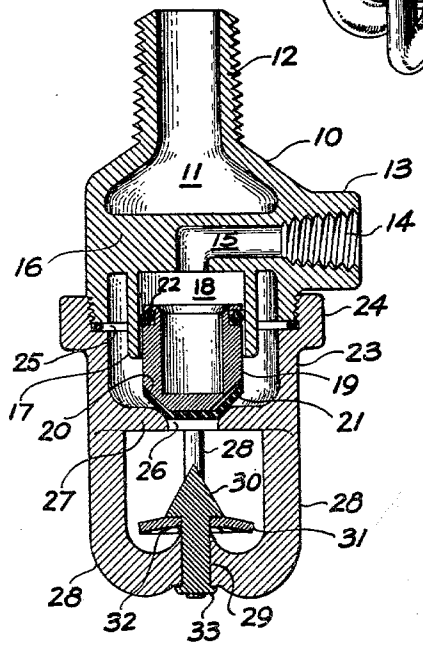


FIG. 2

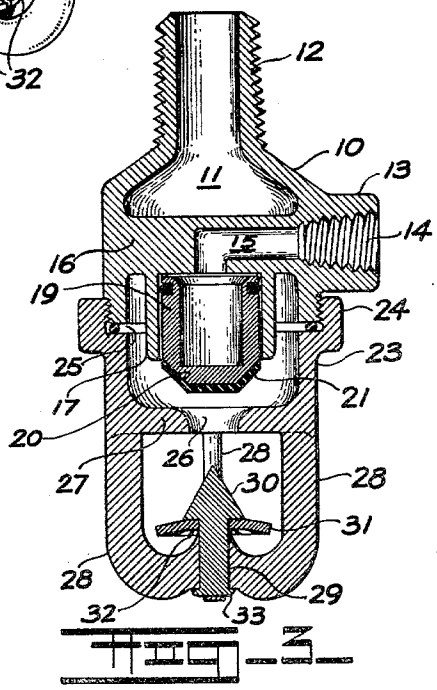


FIG. 3

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PILOT OPERATED SPRINKLER VALVE AND SPRAY HEAD

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4 Claims. (Cl. 239—570)

This invention relates to a sprinkler system for fire protection purposes and more particularly to a novel pilot operated sprinkler valve and spray head for such a sprinkler system which permits the system to be pre-primed with water at full fire main pressure, and is therefore capable of delivering or applying water to a fire in considerably shorter time than that realized with a straight deluge sprinkler system.

The principal object of the invention is the provision of a pilot operated sprinkler valve and spray head for a pre-primed sprinkler system. A further object of the invention is the provision of a pilot operated sprinkler valve and spray head in which fluid pressure from the fire main is used as pilot pressure in controlling the sprinkler valve.

A further object of the invention is the provision of a pilot operated sprinkler valve and spray head of simple, durable construction providing when operating a satisfactory spray distribution pattern for controlling a fire.

A still further object of the invention is the provision of a pilot operated sprinkler valve and spray head in which the valve element operates positively.

The pilot operated sprinkler valve and spray head disclosed herein is advantageously used as the water discharge sprinkler device in a high-speed pilot operated sprinkler system. Such systems are used in severe fire situations where it is anticipated that several sprinklers would operate in a consecutive manner to quickly arrest a fire and prevent spread into adjacent areas. Such systems require that the water be present at full fire main pressure in the distributing pipes of the sprinkler system, and that it, therefore, be controlled at the point of discharge by a sprinkler valve and spray head device which will operate positively to retain the water when the system is not in use and to positively open and distribute the water in a spray pattern when the system operates. In installing such systems on sea-going vessels, the motion of the vessel causes surges in the water line which momentarily increase the fire main pressure being controlled and the pilot operated sprinkler valve and spray head must, therefore, be capable of withstanding such surges of fluid pressure. The device disclosed herein operates efficiently for its purpose.

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, it being the intention to cover all changes and modifications of the example of the invention herein chosen for purposes of the disclosure, which do not constitute departures from the spirit and scope of the invention.

The invention is illustrated in the accompanying drawing, wherein:

FIGURE 1 is a perspective view of the pilot operated sprinkler valve and spray head.

FIGURE 2 is a vertical section through the pilot operated sprinkler valve and spray head showing the valve element in closed position.

FIGURE 3 is a vertical section similar to FIGURE 2 showing the valve element in open position.

By referring to the drawings and FIGURES 1 and 2 in particular, it will be seen that the pilot operated sprinkler valve and spray head comprises a base 10 which is hollow

and defines a chamber 11 and provided with an exteriorly threaded extension 12 arranged for insertion in a standard pipe fitting (not shown). The base 10 incorporates a second connection comprising a sidewardly extending boss 13 in which is apertured and internally threaded as at 14 and which communicates with a passageway 15 within a transverse body section 16 of the base 10.

As seen in FIGURE 2 of the drawings in particular, the chamber 11 in the base 10 extends both above and below the transverse body section 16 and this transverse body section 16 is provided with an annular depending flange 17 which defines a cylinder 18, in which a piston-like hollow valve element 19 is slidably positioned. The valve element 19 has its lower end beveled annularly as at 20 and is provided with a cap-like sealing gasket 21. An annular groove in the upper outer surface of the valve element 19 serves as means for retaining an O-ring 22. The lower portion of the chamber 11 is continued within a body member 23 which has an annular flange 24 thereabout threaded internally and arranged to engage an externally threaded area about the lower portion of the base 10. A gasket 25 provides fluid seal between the base 10 and the body member 23 which are assembled after the valve element 19 has been inserted in the cylinder 18 heretofore described.

It will be observed that there is an opening 26 in a transverse partition 27 in the body member 23 and that it is positioned axially of the device and in registry with the valve element 19 when the same is in closed position as seen in FIGURE 2 of the drawings. A plurality of circumferentially spaced depending arms 28, 28 extend from the body member 23 in spaced relation to the opening 26 and join one another at their lower inner ends where they are integral. A vertical passageway 29 located axially of the integral portion of the arms 28, 28 positions a deflector assembly which includes a pointed stud 30 and a collar-like disc 31 positioned thereon, the disc 31 being provided with circumferentially spaced radially extending slots 32, 32. The lower end of the pointed stud 30 is provided with a fastener 33 to secure the assembly to the arms 28 of the body member 23.

It will be observed that when the exteriorly threaded extension 12 of the base 10 of the device is engaged in a pipe fitting (not shown) which is part of a distributing system for fire extinguishing liquid, such as water, the liquid will communicate with the chamber 11 and thus be controlled by the valve element 19 seated in the valve seat formed about the opening 26 in the transverse partition 27 of the device. Fluid pressure from a pilot operating system (not shown) communicates with the passageway 15 by the way of the boss 13 and a pipe or tubing connection therewith and is thus present within the cylinder 18 and in the interior of the valve element 19 which is hollow, as heretofore noted, so that such fluid pressure exerts a closing action on the valve element 19 relative to the opening 26.

At such time as such fluid pressure in the passageway 15 and cylinder 18 is relieved or reduced, the fluid pressure in the chamber 11 will move the valve element 19 to open position as shown in FIGURE 3 of the drawings. The fluid will then flow outwardly of the opening 26, engage the pointed stud 30 and deflector disc 31 and be sprayed in a desirable fire extinguishing pattern.

It will thus be seen that the pilot operated sprinkler valve and spray head comprises three relatively simple parts; the base 10, the body member 23, which are matingly assembled to form chamber 11 within the same, and that the construction of the base 10 is such that it provides the cylinder 18 for the reception of the valve element 19 which is thereby arranged for appropriate registry with the opening 26 which is the discharge orifice of the sprinkler valve.

In FIGURE 3 of the drawings, the valve element **19** is shown in elevated relation in the cylinder **18**, thereby providing a clear and unobstructed passageway through the chamber **11** for the fire extinguishing fluid.

It will thus be seen that the pilot operated sprinkler valve and spray head disclosed herein meets the several objects of the invention, and having thus described my invention, what I claim is:

1. A sprinkler valve and spray head for fire extinguishing systems comprising a hollow body having first and secondary fluid chambers therein separated by a transverse body section, an outwardly extending annular flange on said transverse body section forming said secondary chamber, separate passageways in said hollow body communicating with said first and secondary chambers respectively, a valve element reciprocably mounted in said secondary chamber and registerable with an outlet opening in said first chamber, and spray forming water deflecting means on said hollow body in alignment with said outlet opening.

2. The sprinkler valve and spray head for fire extinguishing systems set forth in claim 1 and wherein said secondary chamber, said valve element reciprocably mounted therein and said outlet opening and said spray forming and deflector means are all arranged on the axial center line of said head.

3. The sprinkler valve and spray head set forth in claim 1 and wherein the hollow body is formed of two parts, one of which comprises a base in which said first

and secondary chambers are formed and in which said passageways are located, and a body member engaged on said base and forming an extension of said first chamber and in which body member said outlet opening is located and on which body member said spray forming and water deflecting means is positioned.

4. The sprinkler valve and spray head set forth in claim 1 and wherein said secondary chamber is relatively larger in area than said outlet opening and wherein said valve element comprises a piston-like member disposed therein and wherein said valve element has a beveled annular end registrable partially within said outlet opening.

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