July 18, 1939. J. J. PIPER 2,166,264

FIRE ALARM

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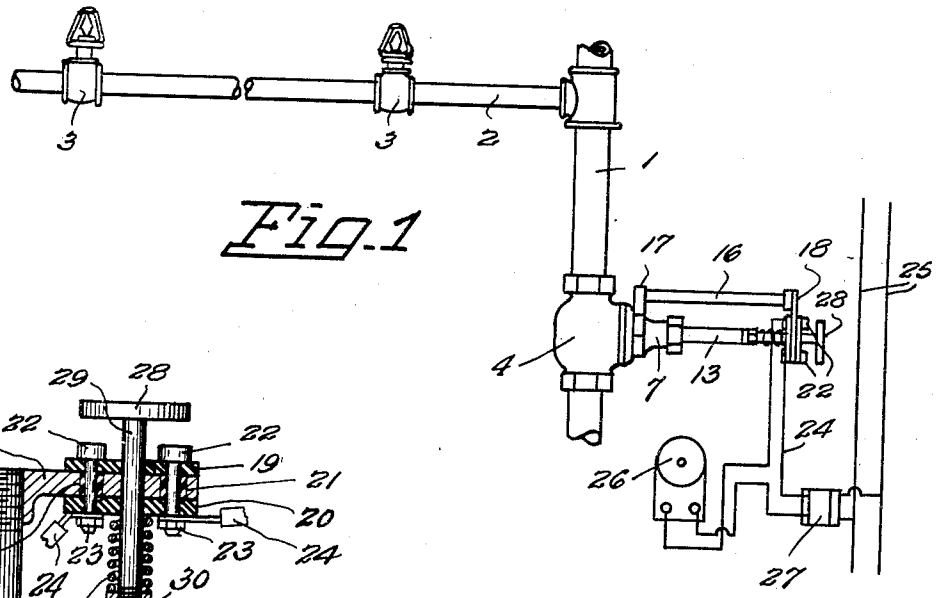


Fig. 1

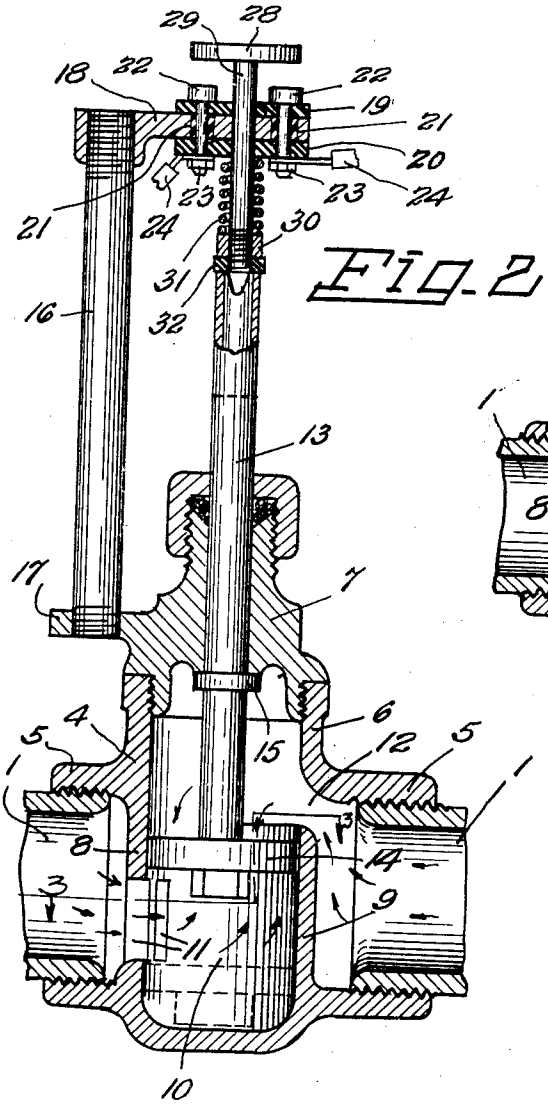


Fig. 2

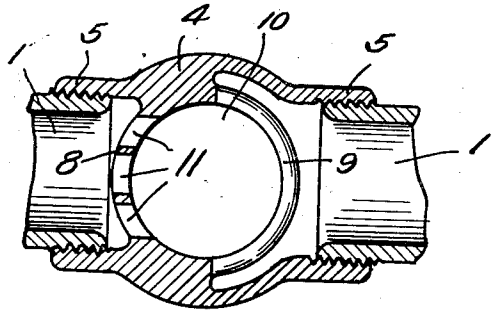


Fig. 3

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FIRE ALARM

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2 Claims. (Cl. 200—81)

This invention relates to a valve actuated fire alarm and has as one of its objects to provide a device of this character wherein a valve mounted in the pipe line of a sprinkler system has means associated therewith for closing a circuit through an alarm and energizing the same when a fusible closure or seal for a sprinkler head is melted and water flows through the pipe line.

Another object of the invention is to provide a valve adapted to be mounted in the pipe line and having a slidable stem adapted to be moved by pressure of flowing water in the pipe line when the fusible seal is melted and effect movement of a contact member into bridging engagement with spaced stationary contacts to close the circuit through an alarm bell.

Another object of the invention is to provide a device of this character wherein the stationary contacts are insulated from each other and carried by a support which is carried by the valve casing and serves not only as a support for the stationary contacts but also as a guide for the shank of the movable contact, thus providing a circuit closing unit which can be easily assembled and applied to the valve casing.

Another object of the invention is to provide a circuit breaker and maker which is disposed over the valve stem with the shank of its movable contact in alinement with the valve stem so that the valve stem may hold the movable contact in its opened position and this contact be moved to a closed position by a spring surrounding its shank when the valve stem is moved to a retracted position.

Another object of the invention is to provide a device of this character which may be very easily installed in the pipe line of a sprinkler already in use in a building.

The invention is illustrated in the accompanying drawing, wherein:

Fig. 1 is a semi-diagrammatic view showing the signal mechanism installed in the pipe line of a sprinkler system.

Fig. 2 is a sectional view taken longitudinally through the valve and the circuit maker and breaker carried thereby.

Fig. 3 is a sectional view taken along the line 3—3 of Fig. 2.

The sprinkler system with which the fire alarm has been shown has the usual pipe line 1 which may be of any length found necessary and is equipped with a suitable number of branch pipes 2 in which are disposed sprinklers 3 having seals of soft solder or other easily fused material which is adapted to be melted with a fire occurs and allow discharge of water from the sprinkler heads.

A valve 3 is mounted in the pipe line and has a casing 4 formed of strong cast metal. This casing has the usual necks 5 for engagement with sections of the pipe line and also a neck 6 with which a hood 7 has threaded engagement, as shown in Fig. 2. Partitions 8 and 9 are formed within the casing or valve housing between the necks 5, as shown in Figs. 2 and 3, and define a central well or chamber 19. The chamber 10 is located directly under the neck 6 and the wall 8 extends the full diameter of the outlet neck while the wall 9 terminates short of the upper portion of the inlet neck. Ports 11 are formed through the wall 8 and the space between the upper edge of the wall 9 and the upper portion of the inlet neck provides a passage 12 through which water may flow. Therefore, under certain conditions, water may enter the chamber 10 through the passage 12 and pass out of the chamber through the ports 11. This will only occur when the seal of one of the sprinkler heads is melted so that water may discharge and extinguish a fire.

A valve stem 13 is slidably mounted through the hood 7 with its inner end portion extending into the chamber 10 and carrying a piston 14 which is slidable longitudinally in the chamber and when in the position shown in Fig. 2, constitutes a barrier between the open top of the chamber and the ports 11 formed through the wall 8. A collar or ring 15 carried by the stem serves to limit outward movement of the stem by engagement with the hood. When all of the sprinkler heads are sealed, water pressure will be applied to both faces of the piston but as there is more lower area than upper area the water pressure will cause the piston to be maintained in the raised position. As soon as the seal for one or more of the sprinkler heads is melted so that water may be discharged, the piston is relieved of pressure against its under face and it will move downwardly so that the ports 11 will be exposed and water may flow through the pipes and be discharged from the sprinkler heads.

The circuit maker and breaker is carried by the valve and operatively associated with the stem and, referring to Figs. 1 and 2, it will be seen that the post or standard 16 is disposed to one side of the stem parallel thereto and has its lower or inner end screwed into an arm 17 projecting laterally from the hood 7. A cross head

or side arm 18, which may be referred to as a bracket, has one end formed with a threaded opening to receive the upper or outer end of the standard 16 and this side arm carries upper and lower blocks of insulation 19 and 20 which shield the side arm and engage opposite ends of bushings 21 which are also formed of insulation and pass through openings formed through the side arm adjacent the free end thereof. Stationary contacts 22 pass through the insulating strips or blocks 19 and 20 and through the bushings 21 and have large heads at their upper ends which bear against the strip 19 while their lower ends carry nuts 23 which, when tightened, will secure the terminals of the conductor wires 24 against strip 20 in tight binding engagement with the shanks of the contacts. The conductor wires 24 lead from the power wires 25 and sections of one of these wires 24 are secured to terminal posts of an electric bell 26 which may be mounted at any convenient place where it will be clearly heard when it rings.

When this improved fire alarm is installed, the valve is mounted in the pipe line, the bell is mounted in a selected location and the conductor wires 24 connected with the power wires in an approved manner, a transformer 27 being interposed in the conductor wires so that the proper current will be delivered to the bell when a circuit is established through the bell. Ordinarily, the sprinkler heads are sealed and the piston 14 remains in the elevated position and the movable contact or bridge will be held out of engagement with the stationary contacts 22.

The movable contact has a shank 29 which is slidably engaged through the bracket arm 18 and insulating strips 19 and 20, and the lower end of the shank is threaded to receive a nut 30 against which bears the lower end of a spring 31 which is coiled about the shank and at its upper end bears against the insulating block 20. The movable contact will thus be urged downwardly and the washer 32 of insulating material will be maintained in engagement with the upper end of the stem 13. As the tapered lower end of the shank is disposed within the hollow upper end portion of the stem, lateral movement of the stem and the shank of the movable contact will be prevented and they will be kept in proper engagement with each other.

As long as the seals for the sprinkler heads are intact, the piston will be held in the raised position but when the seal of one of the sprinkler heads is melted and water flows from the sprinkler head, pressure under the piston will be relieved and water entering the valve housing and passing through the passage 12, will act upon the upper face of the piston to force the piston downwardly. The stem 13 is carried downwardly with the piston and, as it moves downwardly, the spring 31 will cause the movable contact to be shifted downwardly until its head is moved into engagement with the heads of the stationary contacts. Current may then flow from one stationary contact to the other and a circuit will be completed through the electric bell to cause the bell to ring and sound an alarm. It will thus be seen that an audible alarm will be sounded whenever water is discharged to extinguish a fire and a watchman or other attendant will be warned of the fact that a fire has broken out in the building under his care. In case the signal bell is located in a fire house, the engines will be dispatched to extinguish the fire. After the fire has been extinguished, the sprinkler head will again be sealed and the piston and stem returned to the raised position for cutting off flow of water through the valve housing and moving the movable contact out of bridging engagement with the stationary contacts.

Having thus described the invention, what is claimed is:

1. A circuit closer comprising a casing having a fluid inlet and a fluid outlet and a cylindrical chamber between the same, a removable hood for said casing disposed over said chamber in axial alinement therewith, a side arm extending from said hood, a piston slidable in said chamber and having a stem projecting from the casing through said hood, a support carried by said arm and extending therefrom longitudinally of the stem in spaced relation to one side thereof, a bracket carried by said support and extending laterally therefrom transversely of the stem across the outer end thereof, stationary contacts carried by said bracket in insulated relation to the same and to each other, a movable contact for bridging the stationary contacts having a shank slidable through said bracket between the stationary contacts and aligned with said stem, an abutment nut threaded upon said shank, an insulating washer about said shank disposed between the abutment and said stem, and a spring about said shank engaging the abutment and urging the shank toward the stem to maintain the insulating washer in engagement with the outer end of said stem.

2. A circuit closer comprising a casing having an inlet and an outlet and a cylindrical chamber therebetween, said chamber having a wall portion formed with ports communicating with the outlet and an opposed wall portion across the inlet terminating in spaced relation to the top of the casing to provide a passage between the chamber and the inlet, a removable hood carried by said casing over said chamber, a piston slidable in said chamber from a position above the ports to a lowered position exposing portions of the ports above the piston, a stem for said piston slidable longitudinally through the hood, insulated stationary contacts supporting means for said contacts carried by said hood, and a movable contact slidably mounted through the supporting means between the stationary contacts and engaging the stem in insulated relation thereto and adapted to be shifted longitudinally through the hood with the stem to move the movable contact out of engagement with the stationary contacts when the piston is in its normal position above the ports.

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