

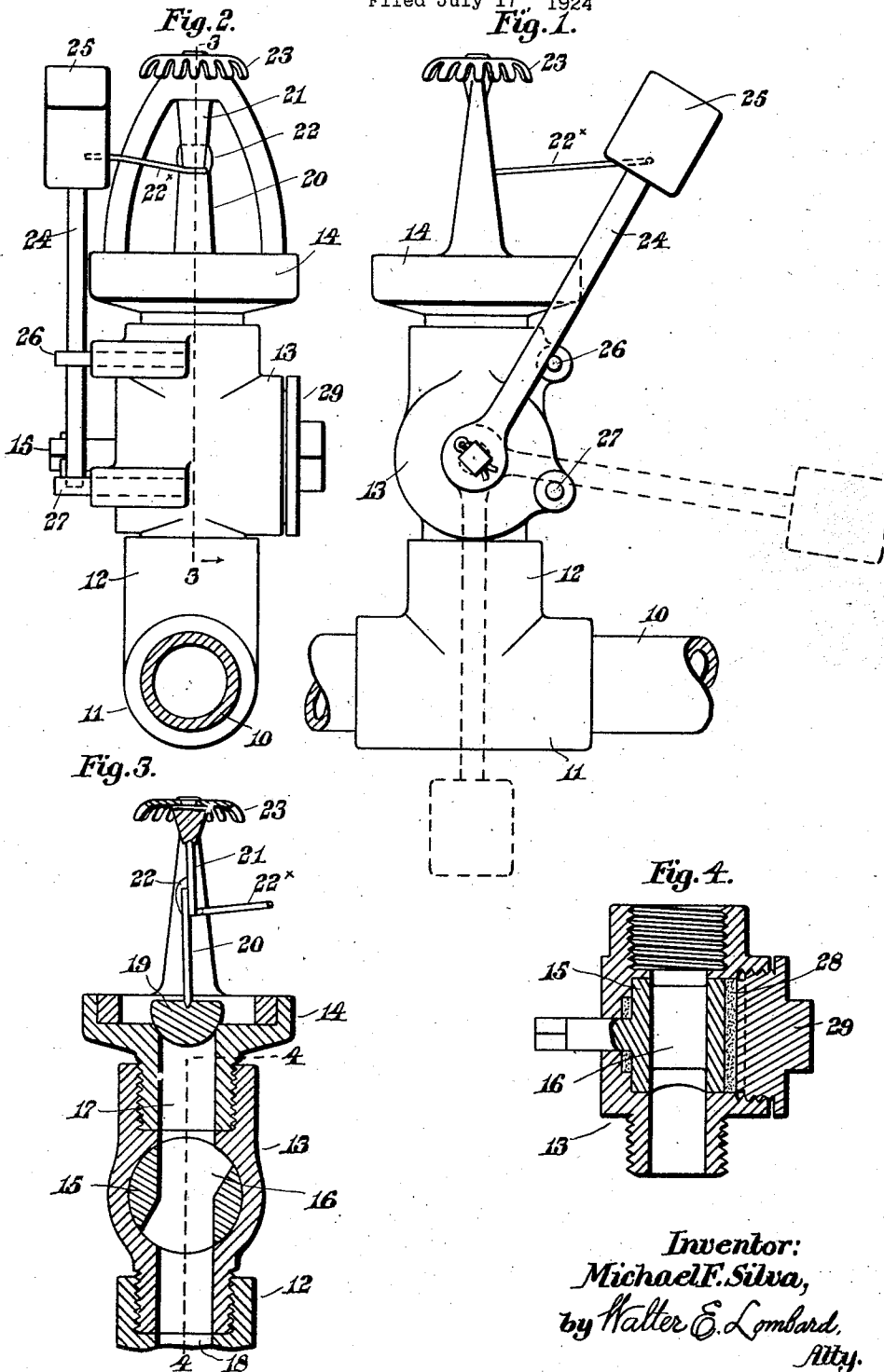
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SPRINKLER HEAD CONTROLLING MECHANISM

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## SPRINKLER-HEAD-CONTROLLING MECHANISM.

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*To all whom it may concern:*

Be it known that I, MICHAEL F. SILVA, a citizen of the United States of America, and a resident of Boston, county of Suffolk, and State of Massachusetts, have invented certain new and useful Improvements in Sprinkler-Head-Controlling Mechanism, of which the following is a specification.

This invention relates to sprinkler heads and has for its object the provision of means whereby said head may be opened at a predetermined heat and after a limited time close a valve which will remain closed until a greater predetermined heat permits the operation of mechanism which will again open said valve and permit the free passage of water through said head.

These objects are attained by the mechanism illustrated in the accompanying drawing.

For the purpose of illustrating the invention, one preferred form thereof is illustrated in the drawings, this form having been found to give satisfactory and reliable results although it is to be understood that the various instrumentalities of which the invention consists can be variously arranged and organized and the invention is not limited to the precise arrangement and organization of these instrumentalities as herein shown and described except as required by the scope of the appended claims.

Figure 1 represents a front elevation of a sprinkler head controlling device embodying the principles of the present invention.

Figure 2 represents a side elevation of the same.

Figure 3 represents a vertical section of same, on line 3, 3, on Fig. 2, and

Figure 4 represents a vertical section of the valve casing and valve, on line 4, 4 on Fig. 3.

Similar characters indicate like parts throughout the several figures of the drawings.

In the drawings 10 is a water supply pipe having in the line thereof a coupling 11 provided with a branch 12 to which is threaded one end of a valve casing 13 to the opposite end of which is secured a sprinkler head 14 of usual construction.

The valve casing 13 has an oscillating valve plug 15 therein provided with a diametrical passage 16, one end of which is adapted, under normal conditions, to register with the passage 17 in the sprinkler head 14,

while the other end, at the same time, will register with the passage 18 in the branch 12 of the pipe coupling 11.

In other words under normal conditions the valve 15 is open, permitting the water in pipe 10 to freely flow to the sprinkler head 14.

The passage 17 in this head 14 is closed by the member 19 retained in position by the plates 20, 21 connected together by a fusible metal connection 22 which is adapted to melt at a predetermined heat and break the connection between the plates 20, 21, thus permitting the force of the water in the passage 17 to remove the member 19 from its seat.

When this member 19 is displaced the water will be discharged from the passage 17 against the cup-shaped disk 23 which will cause said water to be sprayed in every direction.

It often occurs that a slight fire will be sufficient to fuse the metal connector 22 and cause the water to be discharged through the sprinkler head and thus put out the fire.

Under ordinary conditions, the water will continue to be discharged after the fire is out with the consequence very much damage will be caused by water and very little by fire.

To prevent this unnecessary damage to property by water is the object of the present invention, and this desired result is accomplished by the following mechanism.

To one end of the oscillating valve plug 15 is secured a lever 24 having a weight 25 at its outer end, this weight being normally in raised position and slightly off center as shown in the drawings.

The lever 24 when in its normal position rests upon a pin 26 of fusible metal which prevents the accidental dropping of the lever 24 and weight 25 due to the jarring of machinery in the building equipped with the sprinkler system.

This pin 26 is made of metal which will fuse at a predetermined heat slightly greater than that at which the metal connector 22 will fuse or it may be made to melt at the same temperature as that which will melt the metal connector 22 and release the plates 20, 21, normally connected by said connector 22.

A link 22\* of metal not fusible extends from the plate 20 to the weight 25 and serves to insure the breaking of the joint between

the plates 20, 21 when the connector 22 has been fused and the weight 25 has been released by the fusing of the pin 26 in case said joint is not broken when the connector 20 is first fused.

As a consequence when an incipient fire is started and the metal 22 is fused the sprinkler head will operate to discharge water thereon for a limited period of time and then the heat will fuse the pin 26 and release the lever 24 permitting said lever in its movement to rotate the valve plug 15 until the passage 16 therein is perpendicular to the passages 17 and 18. At this time the lever 24 will rest upon another fusible pin 27 extending from the valve casing 13.

The oscillating valve plug 15 will at this time be closed and if the incipient fire has been extinguished the valve 15 will remain closed and no more water can be discharged from the sprinkler 14, thereby saving considerable property damage from water.

The pin 27 is fused at a still greater heat and if the fire is not extinguished at the first discharge of water and gets under headway the increased heat will fuse this pin 27 and release the lever 24 so that it can drop into a vertical position and in so doing again open the valve 15 permitting a continuous flow of water from the sprinkler until the fire has been extinguished and the water supply to pipe 10 is cut off.

One end of the oscillating valve plug 15 has a flat face against which is positioned a friction disk 28 which is pressed into contact with said face by the threaded closure 29. This closure may be adjusted to create the necessary friction upon the oscillating valve plug 15 to retard the lowering of the weight 25 thereby regulating time the sprinkler head will operate before the valve 15 is closed.

By means of this mechanism a given amount of water may be discharged upon an incipient fire before the supply is cut off and if this is insufficient to extinguish the fire a further and continuous supply of water may be discharged on the fire.

It is believed that the operation and many advantages of the invention will be fully apparent without further description.

Having thus described my invention, I claim—

1. The combination of a supply pipe; a sprinkler head therefor having a fusible connection adapted to be released at a predetermined heat to open said head; a valve interposed between said pipe and head and normally open; and automatic means for closing said valve after the sprinkler head has been opened, said means including a weighted arm secured to said valve normally off center and adapted to move downwardly.

2. The combination of a supply pipe; a sprinkler head therefor having a fusible con-

nection adapted to be released at a predetermined heat to open said head; a valve interposed between said pipe and head and normally open; and automatic means including a weighted arm which is adapted to move downwardly and in its downward movement first close said valve after the sprinkler head has been opened and then open said valve by a continuation of its downward movement.

3. The combination of a supply pipe; a sprinkler head therefor having a fusible connection adapted to be released at a predetermined heat to open said head; a valve interposed between said pipe and head and normally open; a weight for moving said valve to close it and again open it; means connected to said sprinkler head for retaining said weight in raised position and adapted to be released at a predetermined heat; and other means for stopping said weight when the valve is closed said means being fusible at a greater heat thereby permitting further downward movement of the weight and the reopening of the valve.

4. The combination of a supply pipe; a sprinkler head therefor adapted to be opened at a predetermined heat; a valve interposed between said pipe and head and normally open; a weight for moving said valve to close it and by its continued movement again open said valve; a fusible member connected to said sprinkler head for retaining said weight in raised position and adapted to be fused at a predetermined heat and release said weight thereby permitting the closing of said valve; and another fusible member to stop the downward movement of said weight when said valve has been closed, said member being adapted to be fused at a greater heat thereby permitting further downward movement of the weight and the reopening of the valve.

5. The combination of a supply pipe; a sprinkler head therefor adapted to be opened at a predetermined heat; a valve interposed between said pipe and head and normally open; a weight for moving said valve to close it and by its continued movement again open said valve; fusible means connected to said sprinkler head for retaining said weight in raised position with said valve open and adapted when fused to release said weight to permit the closing of said valve; a fusible member to stop the downward movement of said weight when said valve has been closed; and means for retarding the rotation of said valve.

6. The combination of a supply pipe; a sprinkler head having a passage there-through; a closing member for said passage; two plates fused together to retain said member in closing position; a valve for closing said passage and normally in open position; a weighted arm for actuating said valve;

means between said plates and said arm for retaining said arm in raised position with said valve open and adapted to be released when the connection between said plates is fused; and means in the path of said arm for limiting the downward movement of said arm when the valve has closed and adapted to permit the further downward movement of said arm to again open the valve when an excessive temperature has been reached.

7. The combination of a supply pipe; a sprinkler head having a passage there-through; a closing member for said passage; two plates fused together to retain said member in closing position; a valve for closing said passage; automatic mechanism for actuating said valve; means connected with said plates for retaining said mechanism in inoperative position with the valve open and adapted to be released by the fusing of the connection between said plates; and fusible means for stopping said mechanism when the valve is closed and adapted to release said mechanism to permit the valve to open again when said stopping means has been fused.

8. The combination of a supply pipe; a sprinkler head having a passage there-through; a closing member for said passage; two plates fused together to retain said member in closing position; a valve for closing said passage and normally in open position; a weighted arm for actuating said valve; a member for retaining said arm in raised position with said valve open and adapted to be fused at a predetermined heat; and another member in the path of said arm for limiting the downward movement of said arm when the valve has closed and adapted to fuse at a temperature greater than said predetermined heat.

9. The combination of a supply pipe; a

sprinkler head having a passage there-through; a closing member for said passage; two plates fused together to retain said member in closing position; an oscillating valve for closing said passage having an opening therethrough adapted to align with said passage at the beginning and ending of its movement and be at right angles to said passage at any intermediate point; a weighted arm secured to said valve; fusible means for normally retaining said arm in raised position with the valve open and releasing it when a predetermined heat has been reached and said means has been fused; and a fusible member for stopping said arm in its downward movement at said intermediate point and releasing said arm to permit further downward movement thereof when the temperature exceeds said predetermined heat.

10. The combination of a supply pipe; a sprinkler head having a passage there-through; a closing member for said passage; two plates fused together to retain said member in closing position; an oscillating valve for closing said passage and movable through less than a half revolution with an opening therethrough aligned with said passage at each end of its movement; a weighted arm for actuating said valve; means connected with said plates for retaining said arm in raised position with the valve open and adapted to be released by the fusing of the connection between said plates; and fusible means for stopping said arm when the valve is closed and adapted to release said arm to permit the valve to open again when said stopping means has been fused.

Signed by me at 746 Old South Bldg., Boston, Massachusetts, this 11th day of July, 1924.

MICHAEL F. SILVA.