

T. GAYNOR, JR.
AUTOMATIC SPRINKLER HEAD.
APPLICATION FILED JULY 6, 1909.

968,144.

Patented Aug. 23, 1910.

Fig. 1.

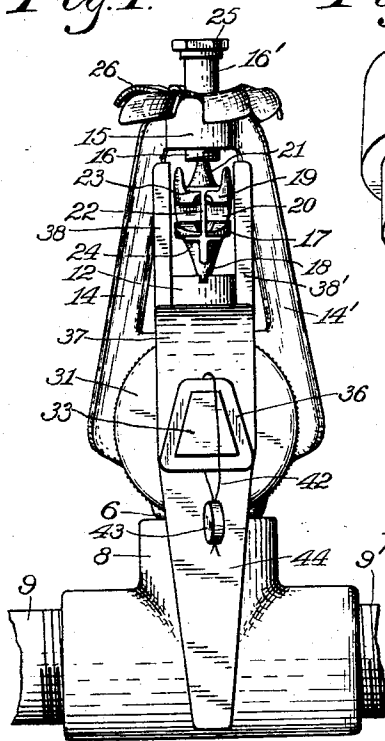


Fig. 2.

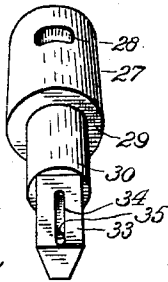


Fig. 3.

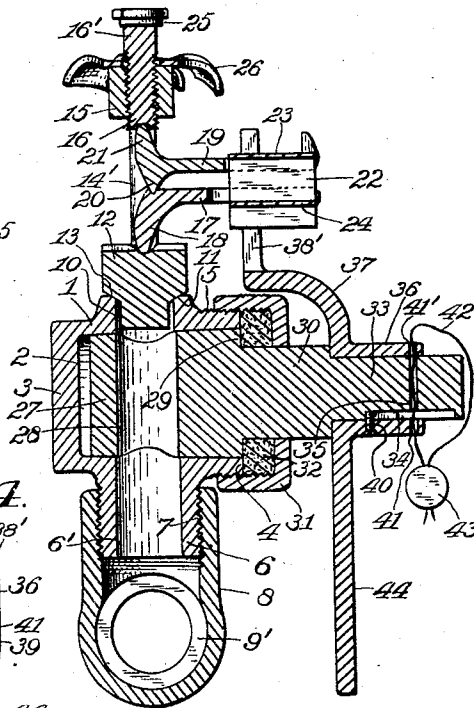


Fig. 4.

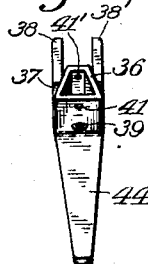


Fig. 5.

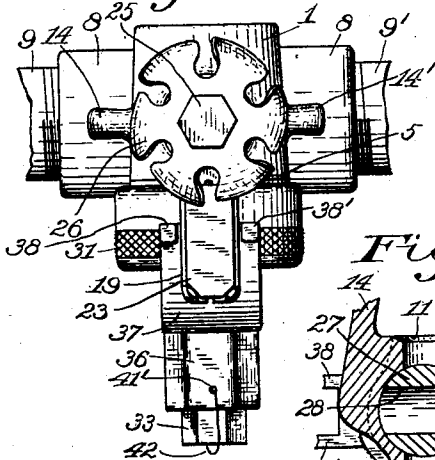


Fig. 7.

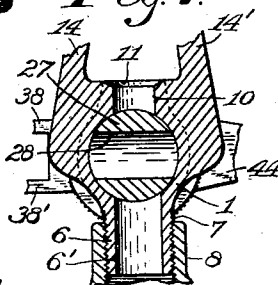
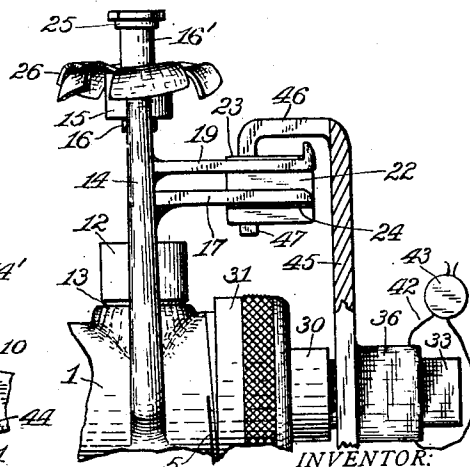


Fig. 6.



WITNESSES:

J. H. Gardner.
K. R. Woddell.

INVENTOR:

Timothy Gaynor, Jr.
BY
E. T. Silvious,
ATTORNEY.

UNITED STATES PATENT OFFICE.

TIMOTHY GAYNOR, JR., OF INDIANAPOLIS, INDIANA, ASSIGNOR TO EDWARD ZINK,
OF INDIANAPOLIS, INDIANA.

AUTOMATIC SPRINKLER-HEAD.

968,144.

Specification of Letters Patent.

Patented Aug. 23, 1910.

Application filed July 6, 1909. Serial No. 506,084.

To all whom it may concern:

Be it known that I, TIMOTHY GAYNOR, JR., a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Automatic Sprinkler-Heads; and I do declare the following to be a full, clear, and exact description of the invention, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

This invention relates to the class of sprinklers that operate automatically to extinguish conflagrations in buildings or elsewhere, the invention having reference particularly to improved means for promptly stopping the flow of water from either one of the sprinkler heads of a system, independently, when the sprinkler head has opened through any cause other than the heat from an actual conflagration, it being well known that sprinklers that are designed to operate as a result of the operation of heat responsive devices are liable to be opened accidentally through carelessness of workmen, or through defects in the structure of heat responsive devices, and entailing considerable loss to goods within the range of the sprinkler before the sprinkler can be closed or its action stopped, it being necessary in many cases to go a considerable distance to reach a stop-cock whereby to shut off the water from the whole system.

The object of the invention primarily is to provide improvements in sprinkler heads whereby the damage by water when there is no conflagration may be largely avoided or reduced to the minimum, a specific object being to provide means whereby the flow of water may be promptly stopped when the sprinkler is in operation, and not only prevent further damage by water, but permit the automatic closing devices to be replaced reliably and in such manner that an inspector or watchman may subsequently know that the apparatus is adjusted or in condition to operate in case of a conflagration, a further object being to provide means whereby the devices for manually closing a sprinkler-head after having been accidentally put in operation may be sealed when reopened following the replacing of the heat

responsive closing devices, so that in case the manually operated closure is tampered with the fact may be detected.

With the above-mentioned and other objects in view, the invention consists in an improved sprinkler head comprising a valve body or case having a nozzle, a stopper for the nozzle, heat responsive means normally holding the stopper in the orifice of the nozzle, a valve in the valve body or case for stopping the flow of water to the nozzle, and provided with an operating lever normally locked against operation by means of the heat responsive apparatus, and means for sealing the operating lever to guard against disconnecting it from the heat responsive apparatus, and the invention consists further in the novel parts, and combinations and arrangements of parts, as hereinafter particularly described and then defined in the accompanying claims.

Referring to the drawings, Figure 1 is a front elevation of the improved sprinkler head connected to a supply pipe and adjusted so as to be in condition for automatic operation; Fig. 2, a perspective view of the improved shut-off valve; Fig. 3, a vertical central sectional elevation of the complete sprinkler head; Fig. 4, a perspective view of the operating lever of the shut-off valve; Fig. 5, a top plan of Fig. 1; Fig. 6, a fragmentary side elevation showing a modification relating to the operating lever; and Fig. 7 a fragmentary sectional view showing the shut-off valve closed.

Similar reference characters in the different figures of the drawings indicate corresponding elements or features of construction.

As preferably constructed, the improved sprinkler head comprises a valve-body 1 having a tapering bore 2 therein adapted to receive a valve plug, the smaller end of the bore being closed by a head 3, and the opposite end of the body being adapted to form a joint face 4, the exterior of the wall of the open end having screw-threads 5 thereon. One side of the valve-body has a nipple 6 formed thereon having a passageway 6' communicating with the interior of the valve body, the exterior of the nipple having screw-threads 7 thereon by which it is connected to a pipe-tee 8 or branch of a sup-

ply line 9, 9'. The opposite side of the valve body has a nozzle 10 at the orifice of which is a valve-seat 11, the nozzle being normally closed by a stopper 12 having a valve face 13 that has a bearing on the valve-seat 11. The valve-body has a yoke thereon comprising two opposite arms 14 and 14' on the ends of which is a head 15 having a screw 16 therein, the screw having a guide part 16' thereon. A bifurcated lever 17 has an arm 18 that bears against the outer end of the plug 12, and another bifurcated lever 19 has a projection 20 that engages the lever 17, and has also an arm 21 that bears against the inner end of the screw 16, the tendency of outward pressure on the stopper being to force the ends of the levers 17 and 19 apart to release the stopper, the ends of the levers, however, being normally held relatively close together by a link 22 having flanges 23 and 24 that engage the levers, said link being composed of suitable material that will fuse at a pre-determined low degree of the temperature, so as to be effected by conflagration to release the levers and permit the water to force the stopper away from the nozzle. The construction and arrangement of the levers and fuse with respect to the stopper is well known, but other specific construction and arrangement may be adopted with the present invention. It is customary to provide the outer end of the guide part 16' with a head 25 and mount a spraying-wheel 26 on the guide part to rotate against the head when the apparatus is in operation.

A plug-valve 27 is fitted in the bore 2 of the valve-body and has a transverse aperture 28 therein to permit the passage of water through the valve body, the plug being adapted to be turned rotatively to stop the flow of the water. The larger outer part of the plug has a shoulder 29 adapted to form a packing joint approximately flush with the face 4 of the valve body. A stem 30 is formed on the valve plug and extends outward beyond the shoulder 29 and has a packing nut 31 thereon that is connected to the screw-threads 5, a packing washer 32 of suitable material being placed against the joint face 4 and the shoulder 29 surrounding the stem 30 within the packing-nut to prevent leakage of water around the stem or from the valve body. Extending from the stem 30 is a shank 33 whereby the valve may be rotated, and it is so shaped that an operating lever having an opening therein adapted to fit closely on the shank can be placed thereon in only one way with respect to direction rotatively so that the position of the lever must indicate accurately the relative position of the aperture 28 in the valve. One side of the shank has a groove 34 therein and the shank has also a transverse hole 35 therein which may open at one

end into the groove as shown, or may be arranged otherwise to receive a seal-wire. The operating lever comprises a sleeve 36 that internally has the same shape in cross-section as the shank 33 and is fitted closely thereon, so as to slide on the shank longitudinally thereof and adapted to turn the shank rotatively, the sleeve having an arm 37 thereon that extends over to and at the side of the nut 31, and two fingers 38 and 38' extend from the arm 37 at opposite sides of the pair of levers 17 and 19, so that if the levers be moved laterally they will bind between the two fingers and prevent further movement of the arm 37, thus preventing the closing of the valve plug 27. A sleeve 36 has a screw-hole 39 therein in which is a screw 40 that enters the groove 34 and is normally seated on the bottom of the groove to prevent accidental movement of the sleeve on the shank. The sleeve which comprises a hub for the operating lever has also two small holes 41 and 41' that normally register with the hole 35, and a seal wire 42 is placed in the holes and the ends of the wire secured together by a suitable seal 43, so that the lever cannot be moved on the valve shank except by force sufficient to break the wire and lead to detection with probable consequent punishment.

In some cases the operating lever which comprises the arm 37 and fingers 38 and 38' may be provided with supplemental handle 44 extending from the hub or sleeve 36 in such direction as to be convenient to reach without the attendant being unnecessarily exposed to the water from the sprinkler head.

If desired the operating lever may comprise a straight arm 45 extending from the sleeve 36 and having a bifurcated angular part 46 from which extends another angular part 47 to engage the levers 17 and 19, the arm 44 extending across the ends of the levers and the part 46 extending opposite the farther lever 19, the bifurcated end 47 performing the same function as the fingers 38 and 38' in connection with the levers.

The sprinkler head may be placed in any suitable position with respect to the supply pipes, either upon the pipe as illustrated, or inverted under the pipe line; and having arranged the levers and fuse and also the shut-off valve and its operating lever and sealed the same as illustrated in Figs. 1, 3 and 5, the apparatus will be in readiness to operate in the usual manner in case of a conflagration. If from any cause the fuse is melted or broken when there is no conflagration or accidentally, the levers 17 and 19 will be released and thrown out of the way by the pressure of the water acting against the stopper 12, the latter, of course, being forced away, so that escape of the water results. The operating lever being released as

result of the levers being forced out of the bifurcated part of the lever, the shut-off valve may be promptly turned, so as to stop the flow of the water and avoid further damage; then an authorized attendant or inspector may replace the stopper, and the levers 17 and 19, and also the fuse and the seal-wire 42 may be severed and removed, after which the set screw 40 may be slackened, which will permit the hub of the operating lever to be moved outward on the shank until the fingers 38 and 38' may be moved past the ends of the levers 17 and 19, and then the valve may be turned so as to open it, and this may be done cautiously in order to make a test to ascertain whether or not the closure has been perfectly made. After the valve plug 27 has been turned so as to permit the passage of the water, the sleeve 36 may be moved inward, so that the fingers will be at opposite sides of the levers 17 and 19. Then the set-screw 40 may be tightened and a new seal applied as before.

It follows from the foregoing that an inspector may readily see at a distance whether or not the lever of the shut-off valve which serves as an indicator is in proper position showing that the shut-off valve is open, and it may readily be observed also whether or not the seal is intact, so that any violent attempt to close the shut-off valve and practically disabling the sprinkler when required to extinguish a fire, may be detected without delay with the exercise of ordinary vigilance on the part of watchmen. It will be seen also that periodical inspections may readily be made of any one of the sprinkling heads to see that it is in proper working order, without shutting off the supply of water from the entire system of supply-pipes.

Having thus described the invention, what is claimed as new, is—

1. A sprinkler head including a valve-body having an outlet for water, a stopper for closing the outlet, temperature responsive means for normally retaining the stopper in position to close the outlet, and a shut-off valve normally open in the valve-body and provided with positive locking means having connection with the tempera-

ture responsive means to prevent closing of the shut-off valve.

2. A sprinkler head including a valve-body having an outlet for water, a stopper for closing the outlet, a shut-off valve normally open in the valve-body to permit passage of the water and having an operating stem, a lever adjustable on the stem longitudinally thereof and capable of closing the shut-off valve, and temperature responsive means normally retaining the stopper in position to close the outlet and having connection with the lever to prevent closing of the shut-off valve.

3. A sprinkler head including a valve-body having an outlet for water, a stopper for closing the outlet, a shut-off valve normally open in the valve-body to permit passage of the water and having an operating stem, a lever movable adjustably on the stem longitudinally thereof and capable of closing the shut-off valve, temperature responsive means normally retaining the stopper in position to close the outlet and having connection with the lever to prevent closing of the shut-off valve, and means for securing the lever to the stem when adjusted in connection with the temperature responsive means.

4. A sprinkler head including a valve-body having an outlet for water, a stopper for closing the outlet, temperature responsive means for normally retaining the stopper in position to close the outlet, a shut-off valve normally open in the valve-body and having an operating stem thereon, a lever mounted on the stem for closing or opening the shut-off valve and normally having connection with the temperature responsive means, the lever being movable on the stem away from the temperature responsive means, and means for sealing the lever on the stem when in connection with the temperature responsive means.

In testimony whereof, I affix my signature in presence of two witnesses.

TIMOTHY GAYNOR, JR.

Witnesses:

WM. A. CONNER,
FRANCIS E. BIBBINS.