No. 721,858. PATENTED MAR. 3, 1903.

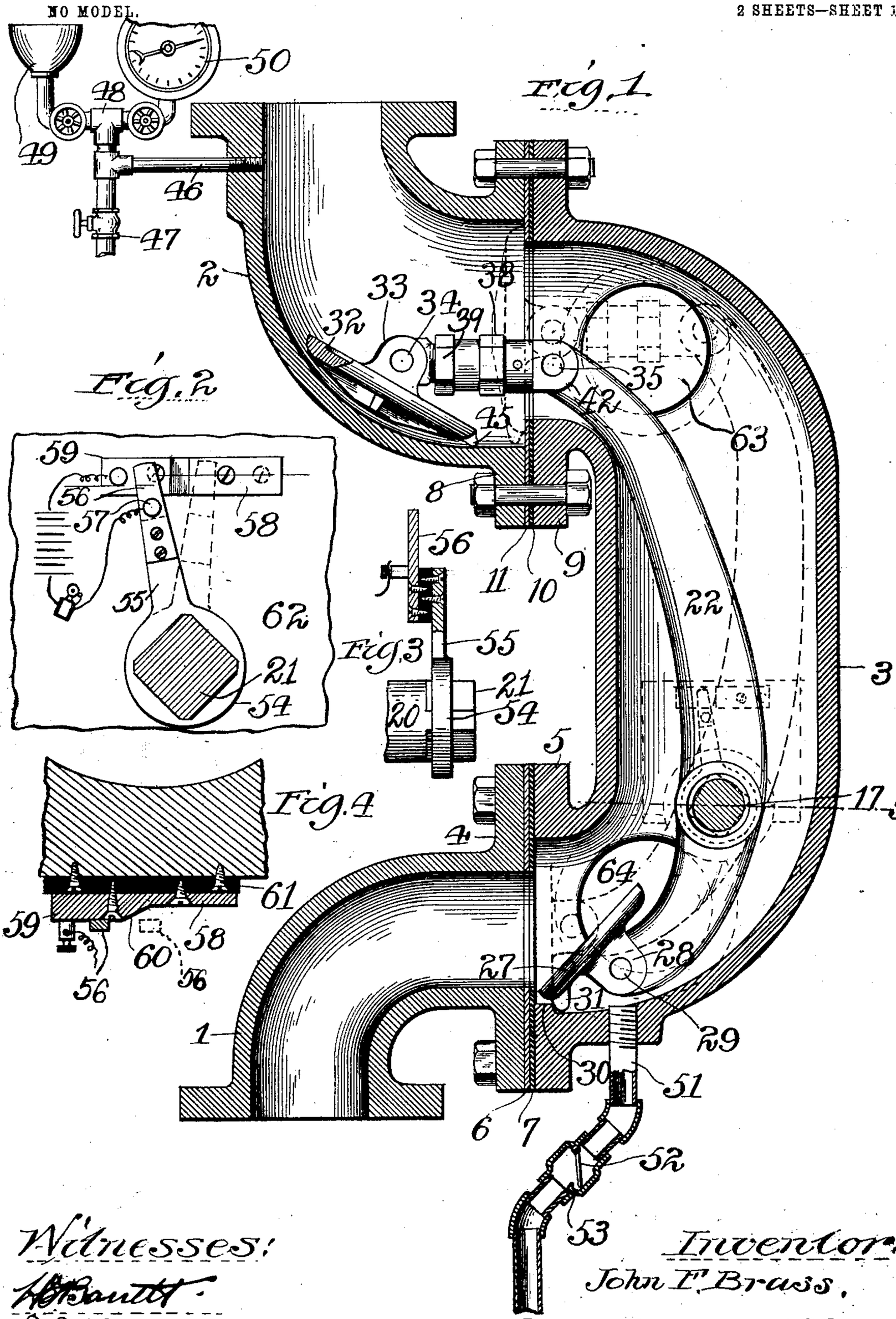
J. F. BRASS.

AUTOMATIC SPRINKLER SYSTEM.

APPLICATION FILED FEB. 3, 1900. RENEWED SEPT. 6, 1902.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1



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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 5

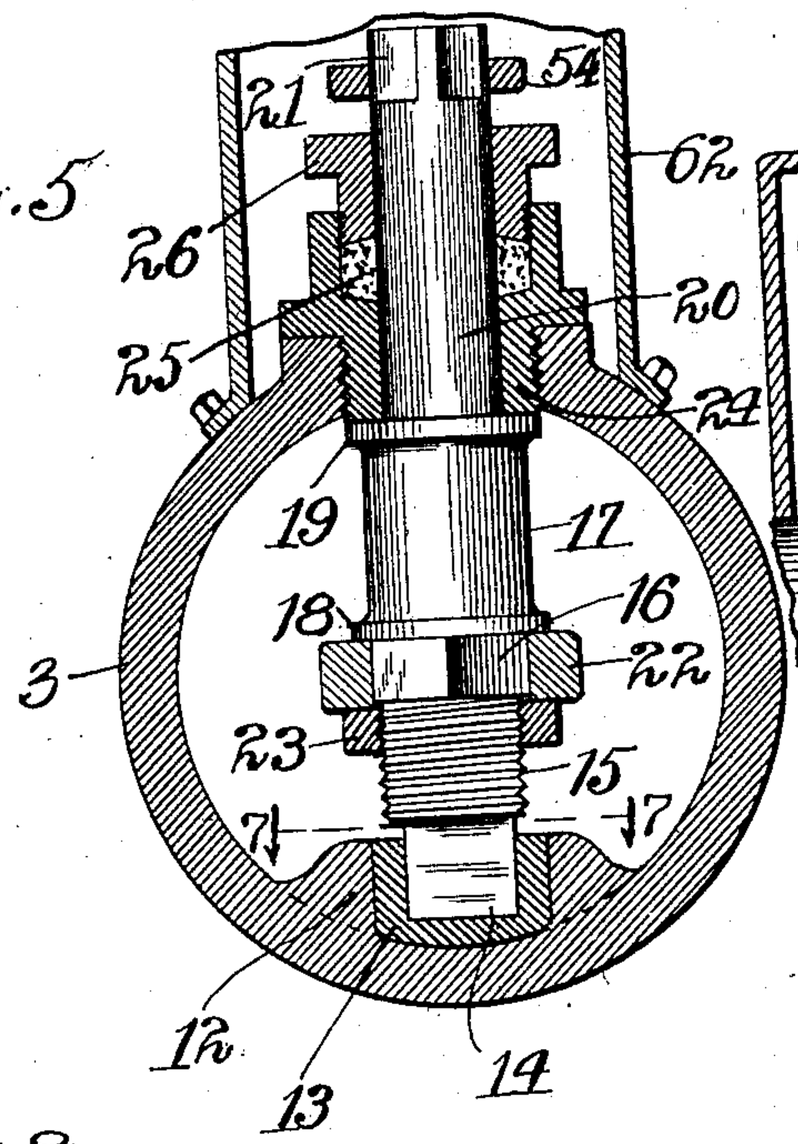


Fig. 6

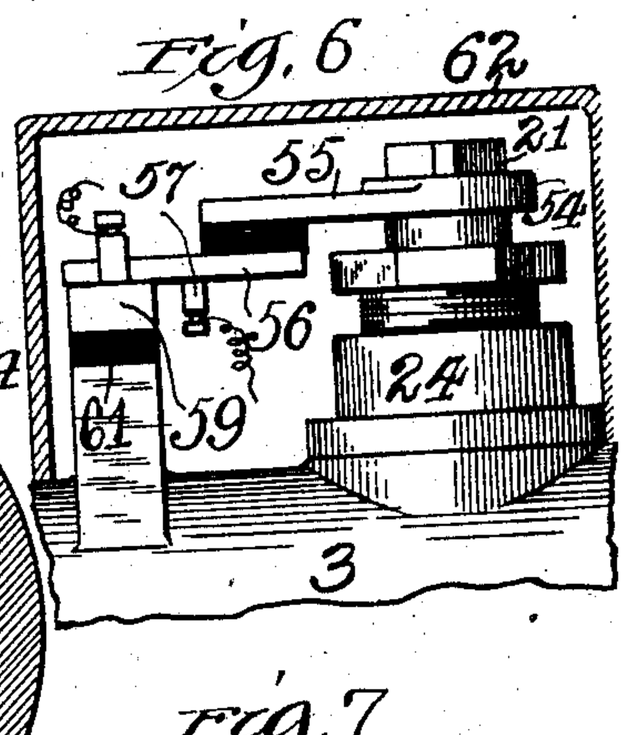


Fig. 7

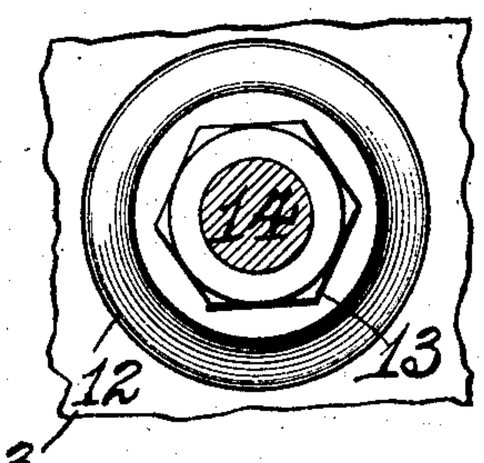


Fig. 8

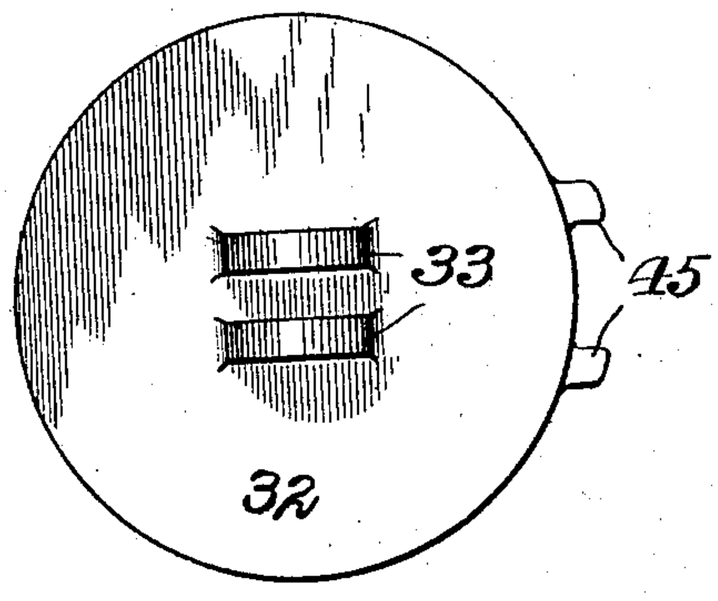


Fig. 9

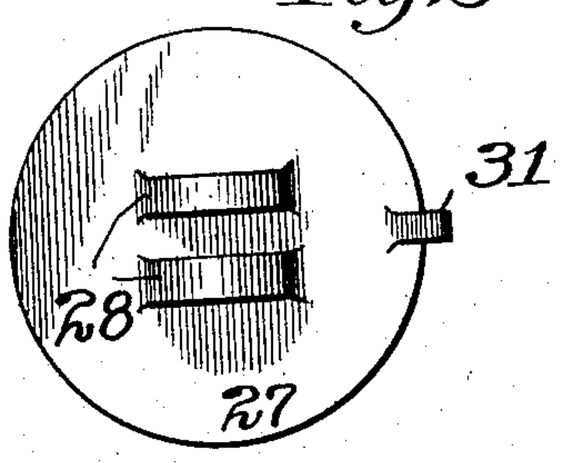


Fig 10

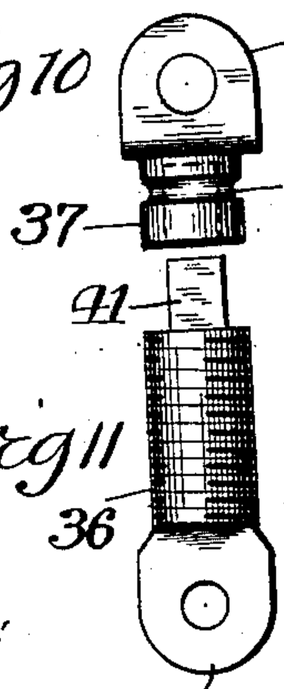


Fig. 12

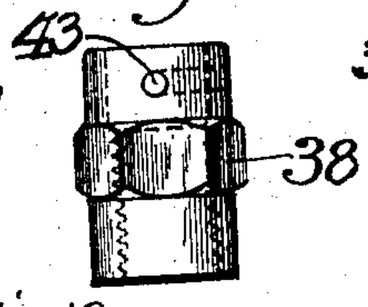


Fig. 15

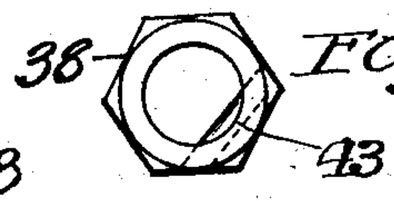


Fig 11

Fig. 13

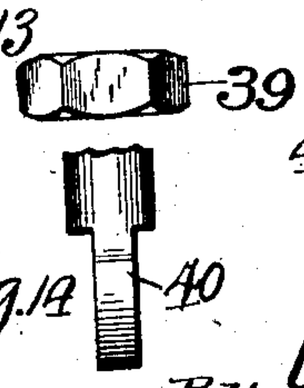
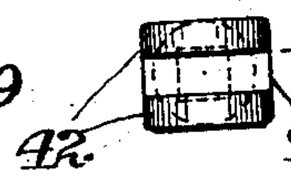


Fig. 16



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UNITED STATES PATENT OFFICE.

JOHN F. BRASS, OF CHICAGO, ILLINOIS.

AUTOMATIC SPRINKLER SYSTEM.

SPECIFICATION forming part of Letters Patent No. 721,858, dated March 3, 1903.

Application filed February 3, 1900. Renewed September 6, 1902. Serial No. 122,421. (No model.)

To all whom it may concern:

Be it known that I, JOHN F. BRASS, a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Automatic Sprinkler Systems, of which the following is a specification.

This invention relates to automatic fire-sprinkler systems; and its object is to provide a novel, simple, and efficient automatic valve therefor.

In the drawings, Figure 1 is a central sectional view of my valve; Figs. 2, 3, and 4, detail views of an electric alarm mechanism; Fig. 5, a section on line 5 of Fig. 1; Fig. 6, a section showing fully the parts illustrated partially in the upper part of Fig. 5; Fig. 7, a section on line 7 of Fig. 5; Figs. 8 and 9, plan views of the upper and lower valves, respectively; and Figs. 10 to 16, detail views of the adjustable connection between the upper valve and its lever or arm.

The elbow 1 is, as usual, in communication with the ordinary gate-valve, (not shown,) while the elbow 2 connects with the riser communicating with the distributing-pipes of the system. A shell or casing 3 communicates and is connected with each elbow in preferably the following manner: The elbow 1 has a flange 4, which is bolted or otherwise secured to a flange 5 on casing 3, between which may be clamped a gasket 6 and a thin brass plate 7. The opening in the casing is, however, of the greater diameter as compared with the opening or passage in the elbow, so that the exposed annular part of the plate 7 will form a valve-seat within the casing. The attachment of the elbow 2 to the casing is similar; but the valve-seat is formed within the elbow by making the elbow-opening of the greater diameter as compared with the opening or passage in the casing. The flange 8 is secured to the casing-flange 9 by bolts, and the gasket 10 and plate 11 are clamped therebetween, so that an annular valve-seat is formed similar to the valve-seat for the lower valve with the exception noted. Within the casing is cast or otherwise formed a lug 12, having a cavity to receive a brass bushing 13, provided with a round hole in which is journaled a transverse bearing-shaft 14. This shaft has a screw-threaded portion 15, a square or angular portion 16, a preferably round enlarged portion 17, having flanges 18 and 19, a round portion 20, and a square or angular head 21. Upon the portion 16 of this shaft is arranged a lever 22, having a transverse angular opening receiving such angular portion 16. A nut 23 screws the lever rigidly on the shaft and forces it against the shoulder 18. In assembling the parts, the lever being already in the casing, the shaft is inserted in the side opening in the casing and passed through the lever and after the nut 23 is screwed on the shaft is inserted in its journal. The side opening above referred to is screw-threaded to receive a sleeve 24, through which the part 20 of the shaft extends and which when screwed in will contact the shoulder or flange 19 to prevent endwise movement. The outer portion of this sleeve is cup-shaped to receive packing 25, held therein by a packing-nut 26. The lower end or arm of the lever carries a valve proper, 27, (which, as shown, is substantially flat and circular,) normally seating on the plate 7, as seen in dotted lines in Fig. 1. On one side of the valve are parallel lugs 28, extending on either side of the arm or lever and pivoted thereto by a pin 29. As shown, a shoulder 30 may be cast or formed in the casing and extended inward from the wall of the passage. At a point adjacent to this shoulder 30 the valve has a projecting lug 31, coacting with this shoulder for the purpose hereinafter described. Upon the upper end or arm of the lever is pivoted a valve proper, 32, having an adjustable connection with the lever. Upon the valve are formed lugs 33, providing a bearing for a pivot-pin 34, and the parts shown in Figs. 10 to 16 form the adjustable connection between such pin and a similar pin 35 in the lever. This connection, as shown, comprises, respectively, a rod or stem 36, a socket 37, a sleeve 38, a locking-nut 39, and means for swiveling the sleeve, &c., on the socket. The rod 36 has a flat end 40, bearing between the lugs 33 and pivoted thereto. The other end 41 is angular and is received by a corresponding hole in the socket. As shown in Fig. 16, the end of the socket has double lugs 42, bearing on either side of the lever and pivoted thereto on pin 35. The sleeve 38 is screw-threaded,

so as to screw upon rod 36. The means for swiveling the sleeve on the socket may be the key-pin 43, as shown, or its equivalent, a set-screw, movable in the circumferential groove 44. By these means the relative position of the socket and rod may be varied to lengthen or shorten the connection, so as to insure a proper seating of both valves when the valve device is set. The parts are held in adjusted position by the jam-nut 39. To prevent the body of the valve 32 from contacting the wall of the elbow, and thus scraping any accumulated dirt from the walls onto the valve-seat or in the corner at the junction between the elbow and casing, I provide projections or fingers 45 on the valve adjacent to this wall, so that these projections only will contact, and thus considerably lessen the possibility of objection from this source, if not prevent it altogether. For priming purposes a pipe 46 communicates with the elbow 2 above the valve and connects with a valve-governed discharge-pipe 47, as well as with a T 48, which communicates, respectively, with valve-governed passages leading, respectively, to a funnel 49 and a gage 50. The use and manipulation of these devices are well known and need no explanation.

In order to normally expose the interior of the shell or casing to atmospheric pressure and to drain away water or moisture that may collect in the shell or casing, a drain-pipe 51 communicates with the lower part thereof. A relief drip-valve 52 is pivoted in an inclined part of the drain-pipe and normally swings clear of its seat 53 to permit water to pass by except when there is pressure in the casing, when it will be caused to close.

The electric alarm appliances are designed to be actuated by the partial rotation of the shaft 14 when the valves are opened. As shown, a disk or plate 54 has an angular hole, so as to be fitted on the angular head 21 on the shaft 14 and is provided with a radial arm 55, carrying a contact-finger 56, having a binding-post 57, but insulated therefrom, as seen in Fig. 3. A contact-plate, preferably having a thin portion 58 and a thick portion 59, with a beveled surface between the two levels, may be secured to and insulated from any suitable part of the valve device, and, as shown, it is attached to an insulated block 61 on the casing. A bonnet 62 may be secured to the shell or casing and inclosing the alarm mechanism and the movable parts of the valve extending extraneous of the casing.

Assuming that the valve is closed, as shown in dotted lines in Fig. 1, with the lower valve exposed to the water-pressure and the upper valve exposed to the air-pressure of the system, the parts will be maintained in this position so long as the air-pressure remains undisturbed. However, as soon as the air-pressure is released in the ordinary and well-known manner by the opening of any sprinkler-head caused by fire or abnormal heat the valves will of themselves unseat independent of the water-pressure, but assisted, of course, by such pressure—that is to say, even if there was neither air-pressure nor water-pressure pressing against the valves, respectively, they would automatically become unseated, and the tendency of such valves is to unseat; but they are held seated by reason of the pressure of the air in the system, if it is a dry-pipe system. This operation of the valves is possible, inasmuch as the valves are located on opposite sides of the same vertical plane. The upper valve, being larger and heavier than the lower valve and arranged on the longer arm of the lever, will drop from closed position and unseat the lower valve. The admitted water will now pass through the casing and through the elbow 2 into the system. By reason of their construction and arrangement both valves drop away from their seats in such a manner as not to impede the passage of the water through the valve device and without danger of reseating. When the system is "fired," the water-pressure on the lower valve will cause such valve to swing rapidly out of the way of the incoming water, and when the valve is set this shoulder is instrumental in causing the valve to swing, so as to prevent its sharp edge from grinding in and cutting the valve-seat, the valve-body being caused to swing to a practically vertical position before any portion of it touches the seat. To seat the valve, the shaft 14 is rotated until the lever stands in normal position, at which time both valves will be seated. When the valve 31 is being drawn to its seat, the fingers 45 will contact the wall of the elbow 2; but the same will not scrape the dirt from the walls onto the valve-seat, as would be the case if the valve-body should be drawn along the wall. The upper valve may be accessible for examination through an ordinary hand-hole 63, and the lower valve may likewise be examined through a similar hand-hole 64, extending through the side of the casing. In case either valve should not seat properly and in unison the connections between the valve 32 and its lever may be lengthened or shortened to remedy the difficulty. Then as soon as the water-pressure and the air-pressure are let onto the system the valve will be in operative condition ready for another and similar operation. The dotted lines in Fig. 2 represent the position of the contact-finger of the alarm device when the valve is set, and such finger remains in this position until the valves open and the shaft 14 is partially rotated, whereupon this contact-finger, which was before separated from the contact-plate, makes contact therewith, as shown in Fig. 4. As shown in this latter figure, the normal position of the contact-finger is slightly inward from the plane or level of the thick part 59, so that when moved it will contact the plate positively. The plate and contact-finger are located in an ordinary electric bell or alarm circuit,

which will be caused to ring when the valves are opened.

It is to be understood that while my valve has been described as used in connection with a dry-pipe system I do so simply for convenience and not as intending to limit myself to such application and that the same may be readily applied in connection with a wet-pipe system.

By the use of my invention I attain many advantages and avoid many objections incident to valves of this particular class. By arranging the valves on either side of the same vertical plane, with the larger and heavier valve on the longer arm of the lever, I provide for the automatic unseating of the valves, and, moreover, such valves when opened are arranged so as not to impede the passage of the water and so as not to be liable of themselves to reseat when once opened.

Although I have described more or less precise forms and details of construction, I do not intend to be understood as limiting myself thereto, as I contemplate changes in form, the proportion of parts, and the substitution of equivalents as circumstances may suggest or render expedient and without departing from the spirit of my invention.

I claim—

1. An automatic sprinkler-valve device comprising a casing having a passage communicating respectively with the sprinkler system and the water-supply, a lever pivoted in such passage, and a loosely-pivoted valve on each end of such lever to govern such passage, said valves governing, respectively, the communication between the water-supply and the passage, and the passage and the sprinkler system.

2. An automatic sprinkler-valve device comprising a casing having a passage communicating respectively with the sprinkler system and the water-supply and also having a communication with the atmosphere, a valve governing the communication between the water-supply and the casing, a second valve governing the communication between the casing and the system and a single lever connection between said valves to which such valves are pivoted, the interior of the casing being exposed to atmospheric pressure whereby said valves are both exposed on one face to such pressure and the first valve is exposed on its other face to the water-pressure and the second valve on its other face to the pressure in the system.

3. An automatic sprinkler-valve device comprising a casing having a passage with connections respectively with the water-supply and the sprinkler system, a lever of the first class pivoted in said passage, and separate valves pivoted on said lever for governing said connections respectively.

4. An automatic sprinkler-valve device comprising a casing having a passage with connections respectively with the water-supply and the sprinkler system, a single lever pivoted on a fixed fulcrum in such casing and separate valves connected with the ends of such lever for governing said connections, both valves being openable in the direction of the flow of water-pressure to the system.

5. An automatic sprinkler-valve device comprising a casing having a passage with communications respectively with the water-supply and the sprinkler system, a lever pivoted on a fixed fulcrum in such casing, and separate valves carried by the ends of such lever for governing said communications and both openable in the direction of the flow of water-pressure to the system, one of such valves having an adjustable connection between it and the lever, such connection consisting of a screw-threaded rod 36 pivotally connected to said last-named valve, a socket-piece 37 receiving rod 36 and pivotally connected with one end of the lever and a sleeve 38 for securing the rod and socket-piece together in different adjusted positions.

6. An automatic sprinkler-valve device comprising a casing having a passage with inlet and outlet ports communicating respectively with the water-supply and the sprinkler system, a single lever pivoted in said passage, an elbow or connection secured to the casing to communicate with its inlet-port but having a passage of less diameter than such port whereby a valve-seat is formed on the casing side of said port, a second elbow or pipe secured to the casing to communicate with its outlet-port but having a passage of greater diameter than such port to form a seat on the elbow side of the outlet-port, and separate valves pivotally connected to opposite arms of said lever and seating on such seats to govern the ports.

7. An automatic sprinkler-valve device comprising a casing having a passage communicating respectively with the water-supply and the sprinkler system, a pivoted valve governing such passage and having projecting lugs or fingers contacting the walls of such passage to prevent the contact of the valve proper therewith when the valve is being drawn to its seat.

8. An automatic sprinkler-valve device comprising a casing having a passage communicating respectively with the water-supply and the sprinkler system, two separate valve-seats in said passage, a shaft extending transverse of such passage, a lever pivoted on such shaft and located within the passage, and a valve carried on each end of the lever and seating on said seats, both valves being openable in the direction of the flow of water-pressure to the system.

9. An automatic sprinkler-valve device comprising a casing having a passage communicating respectively with the water-supply and the sprinkler system, two separate valve-seats in said passage, a shaft extending transverse of such passage and having an angular portion, a lever having an angular hole at its fulcrum-point to receive such shaft

and located within said passage, and valves mounted on the ends of the lever and seating on said seats and both openable in the direction of the flow of water.

10. An automatic sprinkler-valve device for dry-pipe systems comprising a casing having a passage with communications respectively with the sprinkler system and the water-supply, a lever fulcrumed and operating in such passage, and a valve on each end of the lever to govern such communications, the valve exposed to the water-pressure being carried by the short arm of the lever and the valve exposed to the air-pressure of the system being carried by the long arm thereof, such air-pressure normally holding said last-named valve seated and also holding the other valve seated.

11. An automatic sprinkler-valve device comprising a casing having a passage with communications respectively with the sprinkler system and the water-supply, a bearing 12 arranged diametrically opposite a screw-threaded opening in the casing, a shaft passing through such opening and journaled in such bearing, an adjustable sleeve 24 screwing into such opening and receiving the shaft to form a bearing therefor, a lever located within such casing and secured to said shaft and valves carried by such lever and governing said communications, both valves being openable in the direction of the flow of water-pressure to the system.

12. An automatic sprinkler-valve device comprising a casing having a passage with communications respectively with the sprinkler system and the water-supply, a shaft extending through a side wall of the casing and journaled in the opposite wall, such shaft having an angular portion extraneous of the casing for setting the valve device, an alarm device actuated by such shaft and comprising a plate secured to such angular portion of the shaft and having an insulated projecting finger in an electrical alarm-circuit, a contact-plate in said circuit, such circuit being closed by contact of such finger with the plate when the shaft is partially rotated, a lever secured to said shaft and located within the casing and a valve device carried by said lever to govern the passage through the casing.

13. An automatic sprinkler-valve device comprising a casing having a passage with communications respectively with the sprinkler system and the water-supply, two valves seating in such passage on either side of the same plane but normally closing said communications, and a pivoted connection between said valves, and means whereby one of such valves will normally overbalance the other.

14. An automatic sprinkler-valve device comprising a casing having a passage with communications respectively with the sprinkler system and the water-supply, two valves seating in such passage on either side of the same plane passing through the valve-seats but normally closing said communications, a lever pivoted and operating in such passage and having a long arm and a short arm, each arm of the lever carrying one of such valves and both valves being always positioned on opposite sides of such plane.

15. An automatic sprinkler-valve device comprising a casing having a passage with communications respectively with the sprinkler system and the water-supply, a lever pivoted and operating in such passage with a long arm and a short arm, and a valve on each lever-arm, adapted to seat in such passage and both valves being arranged on opposite sides of a plane passing through the seats, one valve being exposed to water-pressure and the other to the system-pressure, the latter valve being the heavier and arranged on the long arm of the lever whereby the valves have a tendency to automatically unseat whenever the system-pressure is released and independently of the water-pressure.

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