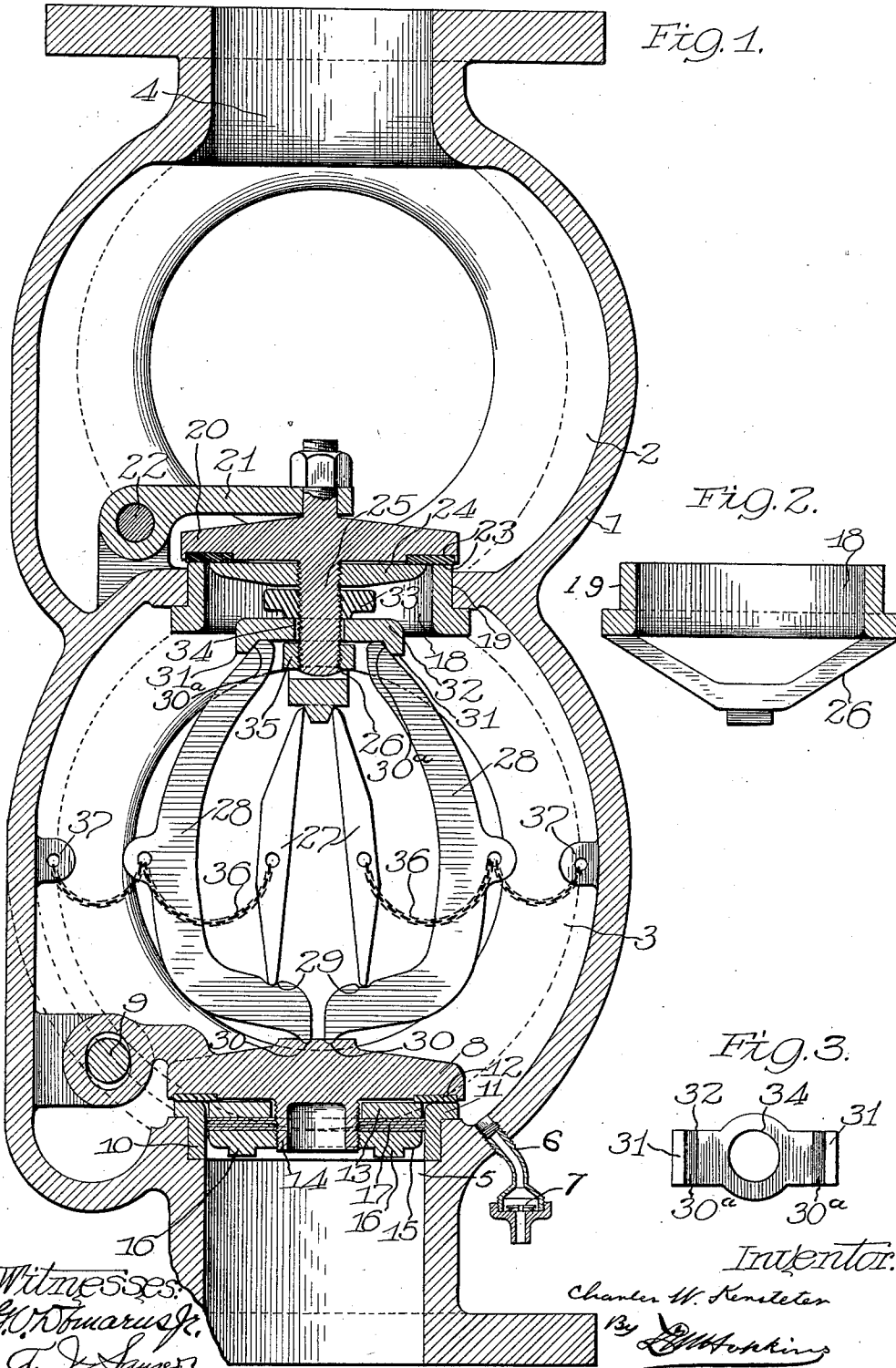


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 MAIN VALVE FOR DRY PIPE AUTOMATIC FIRE EXTINGUISHING SYSTEMS.
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1,041,633.

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UNITED STATES PATENT OFFICE.

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MAIN VALVE FOR DRY-PIPE AUTOMATIC FIRE-EXTINGUISHING SYSTEMS.

1,041,633.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CHARLES W. KERSTETER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Main Valves for Dry-Pipe Automatic Fire-Extinguishing Systems, of which the following is a specification.

The present invention relates to a main valve for a dry pipe automatic fire extinguishing system, the general purposes of which are well known by those skilled in the art and need not be herein set forth at length.

The objects of the invention, generally stated, are to provide a valve of this class which shall be improved in its construction in the respects that its number of necessary parts is minimized, its construction and mode of operation simplified, and its efficiency assured. In accomplishing these objects I make use of holding means involving the principle of a strut which has long been embodied in the construction of sprinkler heads, the strut, according to the present invention, being provided with certain accessories, not found in sprinkler heads, which adapt it for use in main valves.

To these ends the invention consists in the features of novelty that are hereinafter described with reference to the accompanying drawing, which is made a part of this specification and in which:

Figure 1 is a vertical axial section of a main valve embodying the invention. Fig. 2 is an axial section of the ring carrying the seat of the air valve and a yoke forming a fixed abutment against which the strut reacts in one direction. Fig. 3 is a plan view of a link hereinafter described.

The valve casing 1 may consist of an integral casting and has within it a chamber 2, hereinafter called the air chamber and a chamber 3 hereinafter called a low-pressure chamber. The air chamber is in constant open communication with the riser of the system through an opening 4 whereby system pressure is normally maintained within the chamber. The chamber 3 has a port or opening 5 for the inlet of water, said chamber being maintained at atmospheric pressure through a drip pipe 6 provided with a valve 7 which is normally held open by a delicate spring and closes by water-pressure

when water is admitted for supplying the system.

The inlet port is controlled by a valve 8 pivoted within the chamber 3 at one side of the port, as at 9. The port is surrounded by or formed through, a ring or short cylinder 10 the top of which constitutes a seat 11 against which the valve is adapted to rest through the medium of a suitable packing ring, 12, which is clamped against the under side of the main disk of the valve by a follower ring 13 which has a central opening for the free passage of an externally threaded hollow stem 14 projecting downward from the under side of said disk, the follower ring being held in place by a nut 15, provided with lugs or other suitable features 16 for receiving a wrench or tool by which it is screwed on to the stem 14, a second packing ring 17 being interposed between the nut and the follower ring. The packing ring 17 engages the ring 10 some distance below its upper end and has a piston fit in the ring 10 so that it will act as a piston valve and prevent the flow of water through the port 5 even when the valve 12 is unseated and slightly above its seat. This packing ring 17, therefore, forms an auxiliary valve which prevents the leakage between the valve 12 and its seat, should the valve be momentarily unseated, as by water hammer, and in this way the admission of water to the low pressure chamber is prevented until the holding mechanism is tripped.

The chambers 2 and 3 communicate with each other through a port 18, formed through a ring 19 which fixedly engages the valve casing and the upper surface of which forms a seat for a valve 20, carried by a lever 21, fulcrumed in the chamber 2 at one side of the port as shown at 22. The main disk of the valve bears against its seat through the medium of a packing ring 23 which is clamped in place by a nut 24 screwed on to a stem 25 which projects downward from the under side of the main disk of the valve. The ring 19 is formed integrally with a yoke 26 which affords a fixed abutment against which one end of each of a pair of straight struts bears; the other end of each of said struts bearing upon one of a pair of bent levers 28, respectively. Each of the struts bears against the corresponding lever at a point somewhat off-

set from a straight line drawn from one end of the lever to the other and one end of each of the levers bears directly against the upper side of the valve 8 at the point 30 while its other end is sloped or inclined, and engages a complementary inclined surface of a shoulder 31 on a link 32.

It will be understood that the link has a shoulder 31 at each end, that the inclined surfaces of said shoulders are presented inward, toward each other, so as to engage the outwardly presented inclined surfaces of the levers 28, whereby when the parts are thus engaged the levers will be prevented from moving away from each other. The tendency of the shoulders 31 is to draw the lever toward each other when downward pressure is exerted upon the link 32, the engaging inclined surfaces acting as cams, and this drawing of the upper ends of the levers toward each other will rock them about their bearing points 30 on the valve 8 and move the bearing points 29 of the struts 27 toward each other, thus producing an endwise pressure which reacts in one direction against the yoke 26 and in the other direction against the valve 8. The aforesaid downward pressure upon the link 32 is exerted by a nut 33 fitting on the stem 25 and having suitable means for engagement either by hand or by wrench or other tool for turning it, the lower face of the nut being in direct contact with the upper face of the link and the link being provided with a central opening 34 for the free passage of the stem 25, on to the lower end of which is turned a nut 35 adapted to engage the under side of the link. The levers 28 are preferably more or less flexible, or springy, and this is preferred because the water hammer, especially if it is excessive, will be taken up and dissipated by the levers and thus prevented from even momentarily unseating the air valve 20 and permitting a reduction of the air pressure in the system, but where the water hammer is not severe the levers may, if desired, be rigid, or practically so.

The struts and levers are connected to loose chains 36 which are anchored to lugs 37 in the chamber 3 for the simple purpose of preventing them to escape from the chamber or obstructing the ports when the parts of the valve holding mechanism separate.

What I claim as new and desire to secure by Letters Patent is:

1. A main valve for dry pipe automatic fire extinguishing systems having a casing, said casing having an air chamber communicating with the system, a second chamber having a port for the inlet of water, valves adapted to said ports, respectively, and mechanism interposed between the valves for transmitting pressure from one to the other, said transmitting means having a pair

of levers, a pair of struts, one end of each of which bears against one of the levers, an abutment against which the other ends of said struts bear, and means interposed between the air valve and the levers for normally holding the levers in the operative positions.

2. A main valve for dry pipe automatic fire extinguishing systems having a casing, said casing having an air chamber communicating with the system, a second chamber having a port for the inlet of water, valves adapted to said ports, respectively, and mechanism interposed between the valves for transmitting pressure from one to the other, said transmitting means having a pair of levers, a pair of struts, one end of each of which bears against one of the levers, an abutment against which the other ends of said struts bear and means interposed between the air valve and the levers for converting the downward pressure of the air valve into lateral pressure against the levers for forcing them toward each other.

3. A main valve for dry pipe automatic fire extinguishing systems having a casing, said casing having an air chamber communicating with the system, a second chamber having a port for the inlet of water, and a port through which said chambers communicate, in combination with valves adapted to said ports, respectively, and means interposed between the valves for transmitting pressure from one to the other, said transmitting means having a pair of levers, a pair of struts bearing upon the levers, a link connecting the ends of the levers and means interposed between the link and the air valve for forcing the link toward the levers, the engaging surfaces of the link and levers being inclined or cam-like.

4. A main valve for dry pipe automatic fire extinguishing systems having a casing, said casing having an air chamber communicating with the system, a second chamber having a port for the inlet of water, and a port through which said chambers communicate, in combination with valves adapted to said ports, respectively, and means for transmitting pressure from one of said valves to the other, said transmitting means having a pair of levers, a pair of struts each bearing at one end upon one of said levers, and means interposed between the air valve and levers for drawing the levers toward each other.

5. A main valve for dry pipe automatic fire extinguishing systems having a casing, said casing having an air chamber communicating with the system, a second chamber having a port for the inlet of water, and a port through which said chambers communicate, in combination with valves adapted to said ports, respectively, and means for transmitting pressure from one of said valves to the other, said transmitting means having a

pair of bent spring levers, a pair of struts each bearing at one end upon one of said levers, and means interposed between the air valve and the levers for normally preventing the levers from moving away from each other.

6. A main valve for dry pipe automatic fire extinguishing systems having a casing, said casing having an air chamber communicating with the system, a second chamber having a port for the inlet of water, and a port through which said chambers communicate, in combination with valves adapted to said ports, respectively, and mechanism for transmitting pressure from one of said valves to the other, said transmitting mechanism having a pair of bent spring levers, a pair of struts one end of which bears upon one of said levers, a link connecting said levers and means engaging the link for holding it normally in operative position.

7. A main valve for dry pipe automatic fire extinguishing systems having a casing, said casing having an air chamber communi-

cating with the system, a low-pressure chamber having a port for the inlet of water, and a port through which said chambers communicate, in combination with valves adapted to said ports, respectively, and mechanism located in the low-pressure chamber for holding the water valve closed, said holding mechanism having a pair of offset spring levers, one end of each of which bears upon the upper side of the water valve, a link connecting the other ends of said levers for normally preventing them from moving away from each other, a stem projecting from the under side of the air valve and engaging the link for normally holding it in operative position, a pair of straight struts one end of each of which bears upon one of said levers at an offset point, and a yoke supported by the casing, upon which the other ends of said struts bear.

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Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."