G. I. ROCKWOOD.

DRY PIPE VALVE.

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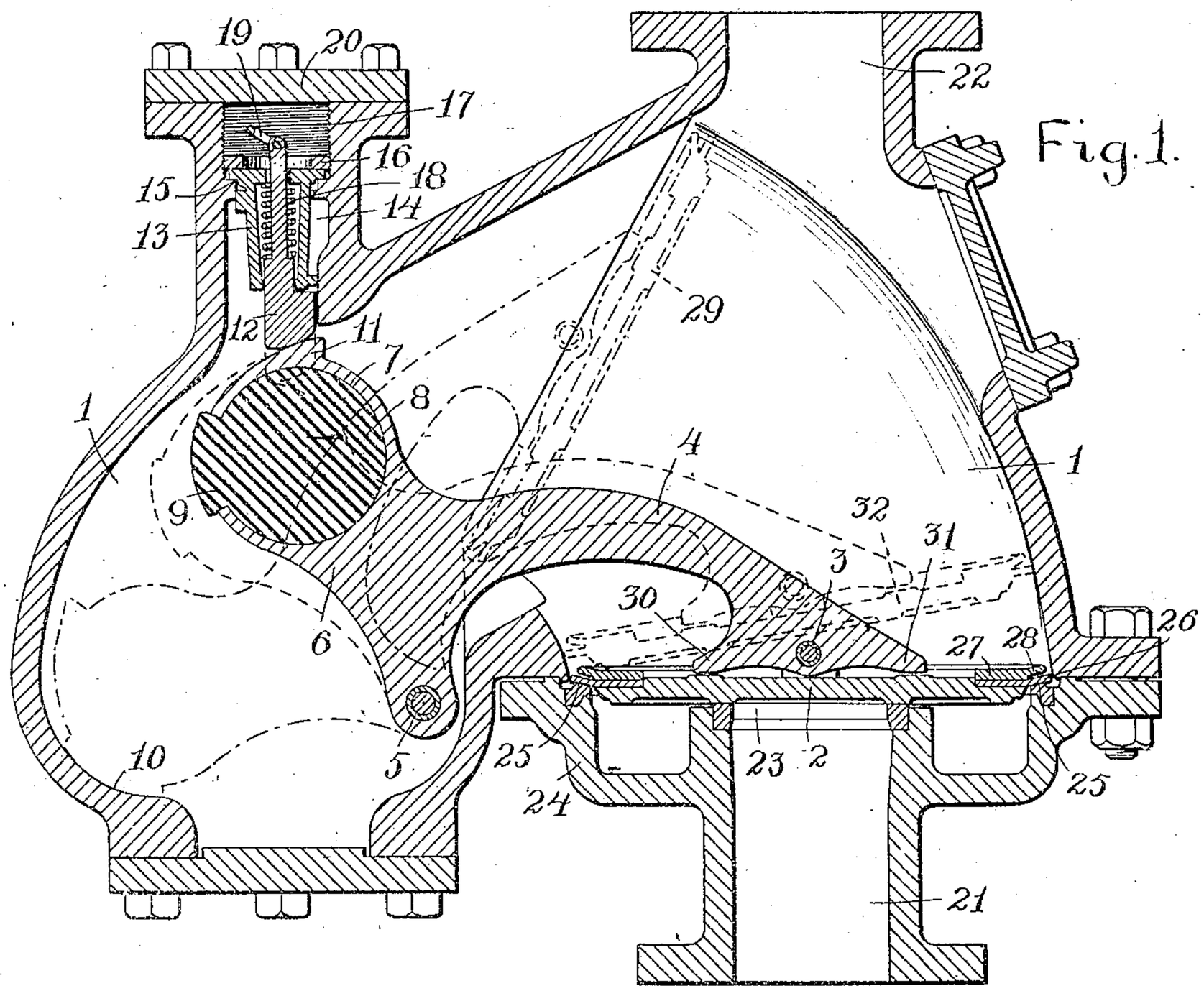

Fig. 1.

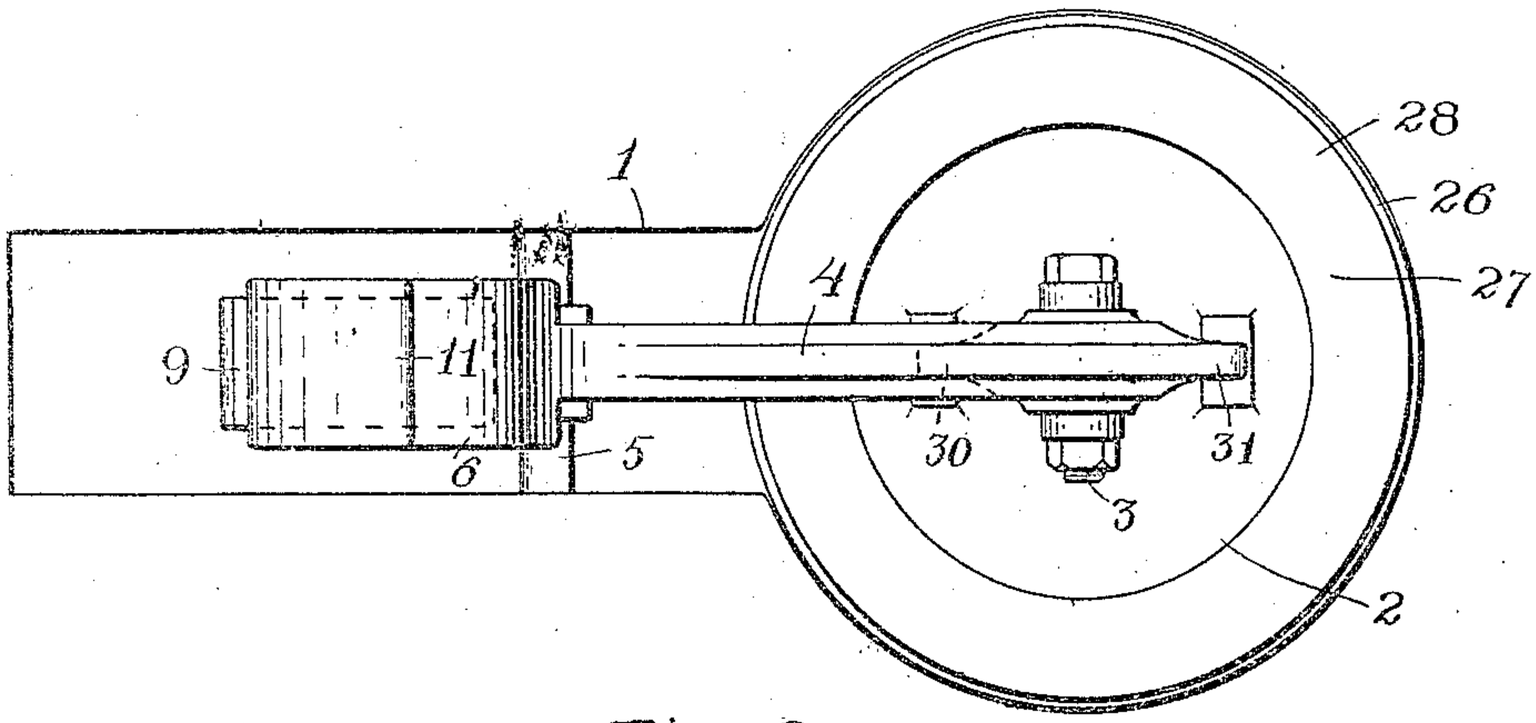

Fig. 2.

Witnesses

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DRY-PIPE VALVE.

No. 914,883. Specification of Letters Patent. Patented March 9, 1909.

Application filed June 3, 1907. Serial No. 376,922.

To all whom it may concern:

Be it known that I, GEORGE I. ROCKWOOD, a citizen of the United States, residing at Worcester, in the county of Worcester and Commonwealth of Massachusetts, have invented a new and useful Improvement in Dry-Pipe Valves, of which the following is a specification, accompanied by drawings forming a part of the same, in which—

Figure 1 represents a vertical central sectional view of a dry pipe valve embodying my invention, and Fig. 2 is a detached plan view of the valve plate and rocking lever.

Similar reference figures refer to similar parts in the different views.

The object of my present invention is to provide an improved dry pipe valve adapted for use in a system of automatic sprinklers, said valve being inserted in the water supply pipe to the sprinkler system, by which the pressure of water is resisted by an air pressure in the pipe between the dry pipe valve and the sprinklers, and my present invention consists in the construction and arrangement of parts as hereinafter described and pointed out in the annexed claims.

Referring to the accompanying drawings 1 denotes a valve casing inclosing a chamber containing a differential valve plate 2, preferably circular in plan view and having a pivotal connection at 3 with a rocking lever 4, pivoted within the casing at 5, and provided with a counterbalancing arm 6 having at its end a chamber 7 which is filled with a soft metal 8, such as lead, having a projecting boss 9 to form a contacting surface adapted to strike against the inner wall of the casing at 10, when the lever 4 is rocked to its full extent in opening the valve. The arm 6 of the lever is also provided with a notch or shoulder 11 adapted to be engaged by a latch 12 when the valve plate is raised a short distance from its seat, in order to prevent the return of the valve plate. The latch 12 slides vertically in a sleeve 13 inserted through an opening 14 in the upper wall of the casing, said sleeve being supported by a projecting shoulder 15 and held in place by an annular nut 16 engaging the internal screw thread 17. The sleeve 13 contains a spiral spring 18 which exerts a downward pressure against the latch 12 and insures its engagement with the shoulder 11. The upper end of the latch 12 is provided with a ring handle 19 which is disclosed by the removal of the cap 20 to enable the latch to be lifted to release the lever 4.

Attached to the bottom of the casing 1 is a pipe 21 leading from a source of water supply under pressure, and the casing is also provided at 22 with an opening communicating with a series of automatic sprinklers. The pipe 21 is provided at its upper end with a valve seat 23 closed by the valve plate 2, and with an annular cup shaped flange 24 provided with a valve seat 25 of greater diameter than the valve seat 23 to receive an annular flexible valve 26 projecting from the edge of the valve plate 2 and held between the valve plate and a clamping ring 27. The valve ring 27 has an outwardly projecting flange 28 which overlaps the annular valve 26, in order to limit the upward bending movement of the annular valve 26. The annular valve 26 has a circular outer edge and the inner wall of the casing 1 is circular in cross section taken on a radial line from the axis 5 of the rotation of the valve plate, so that during a swinging movement of the valve plate from its position shown in Fig. 1 to the position indicated by the broken lines 29, Fig. 1, the annular valve 26 substantially fills the space within the casing, the edge of the annular valve 26 being either in contact with the inner wall of the casing or in proximity thereto.

The rocking lever 4 is provided with laterally projecting arms 30 and 31 which extend over the top of the valve plate, with their outer ends in proximity to the upper surface of the valve plate, so that a slight rocking motion of the valve plate on its pivot 3 is permitted, but its rocking motion is limited by the arms 30 and 31.

When the valve plate 2 is in the position shown in Fig. 1 the supply pipe 21 is closed, and the space between the valve plate and sprinklers is filled with compressed air of sufficient pressure to hold the valve plate in its position, notwithstanding the water pressure in the pipe 21 against the under side of the valve plate. The difference in diameter between the upper surface of the valve plate and the under surface subjected to pressure of water in the pipe 21 enables a given air pressure in the valve casing to withstand a greater water pressure in the supply pipe. By this means the flow of water is prevented from entering the valve casing and flowing to the sprinklers, and the danger of freezing

is therefore obviated when the sprinklers and their connecting pipes are placed in an exposed position. The weight of the counterpoise and the weight of the lever 4 and valve plate 2 are so proportioned that when the valve plate is seated, in the position shown in Fig. 1, the rocking lever is in a position of stable equilibrium, but when the valve plate is raised through a certain portion of its rocking movement the counterpoise becomes operative and carries the valve plate into its elevated position, as indicated by the broken lines 29. If the valve plate, however, be raised only a short distance by a certain impulse of water in the pipe 21 it will be caught by the latch 12 and the valve plate held from reseating itself, and supported in the position shown by the broken lines 32 to prevent its entirely closing. In case the valve is thrown violently open causing a heavy stroke of the counterpoise against the casing, any injurious effect upon the casing is prevented by means of the projecting boss 9 coming in contact with the casing and providing for a slight compression of the soft metal 8, thereby relieving the blow against the casing.

A water seal may be provided above the valve plate 2 from which, by the correspondence in shape between the valve 2 and casing 1, water will be carried into that portion of the casing inclosing the counterweight 8 as the valve plate 2 rises. By a proper proportioning of the lever 4 a dash pot action may be secured just before the valve plate 2 reaches the position shown by broken lines 29 in contact with the casing, so that the speed of movement of the valve plate 2 in opening is arrested and the valve plate 2 gives no violent blow against the casing. This action depends upon the circular shape both of the casing in cross section and of the valve plate, as shown in Fig. 2.

I claim,

1. In a dry pipe valve, the combination with a casing having a water inlet, of a rocking valve plate arranged to close said inlet, with its entire periphery in contact with the interior wall of said casing during its rocking movement, thereby preventing passage of water between said valve plate and said casing during said rocking movement.

2. In a dry pipe valve, the combination with a casing approximately circular in cross section having a chamber communicating therewith and a water inlet to said casing, of a lever fulcrumed in said chamber, having one arm extending into said casing and the other arm provided with a counterweight extending into said chamber, a circular valve plate of approximately the diameter of said casing attached to said first arm and arranged to contact with a valve seat concentric with said inlet, said valve plate arranged to prevent the passage of water between its edge and said casing while said valve is being raised, thereby carrying water in said casing into said chamber.

3. In a dry pipe valve, the combination with a casing having a water inlet, a lever fulcrumed in said casing carrying on one arm a valve plate for closing said inlet and on the other a counterweight to balance said valve plate, of a spring actuated latch in the path of said counterweight when said valve plate is lifted, arranged to engage said counterweight on its return before said valve plate is entirely closed.

4. A dry pipe valve, comprising a casing, a lever fulcrumed within said casing, a valve plate carried by one end of said lever, and a counterweight of soft metal carried by the opposite end of said lever adapted to contact with the casing when said valve plate is opened.

5. A dry pipe valve, comprising a circular casing having a water inlet, a rocking circular valve plate for closing said inlet, with its diameter approximately the diameter of the casing, an extension from said casing inclosing a counterweight to balance said valve plate and arranged to be filled with water from the casing by the lifting of said valve plate.

6. A dry pipe valve, comprising a circular casing having a water inlet, a circular rocking valve plate of the same diameter as said casing arranged to close said inlet, a chamber communicating with said casing, said valve plate arranged to prevent the passage of water between its edge and said casing while it is being rocked, thereby carrying water from said casing into said chamber.

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Witnesses:

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