No. 635,771. Patented Oct. 31, 1899.

F. GRAY.

VALVE APPARATUS.

(Application filed Aug. 5, 1897.)

(No Model.)

Fig. 1.

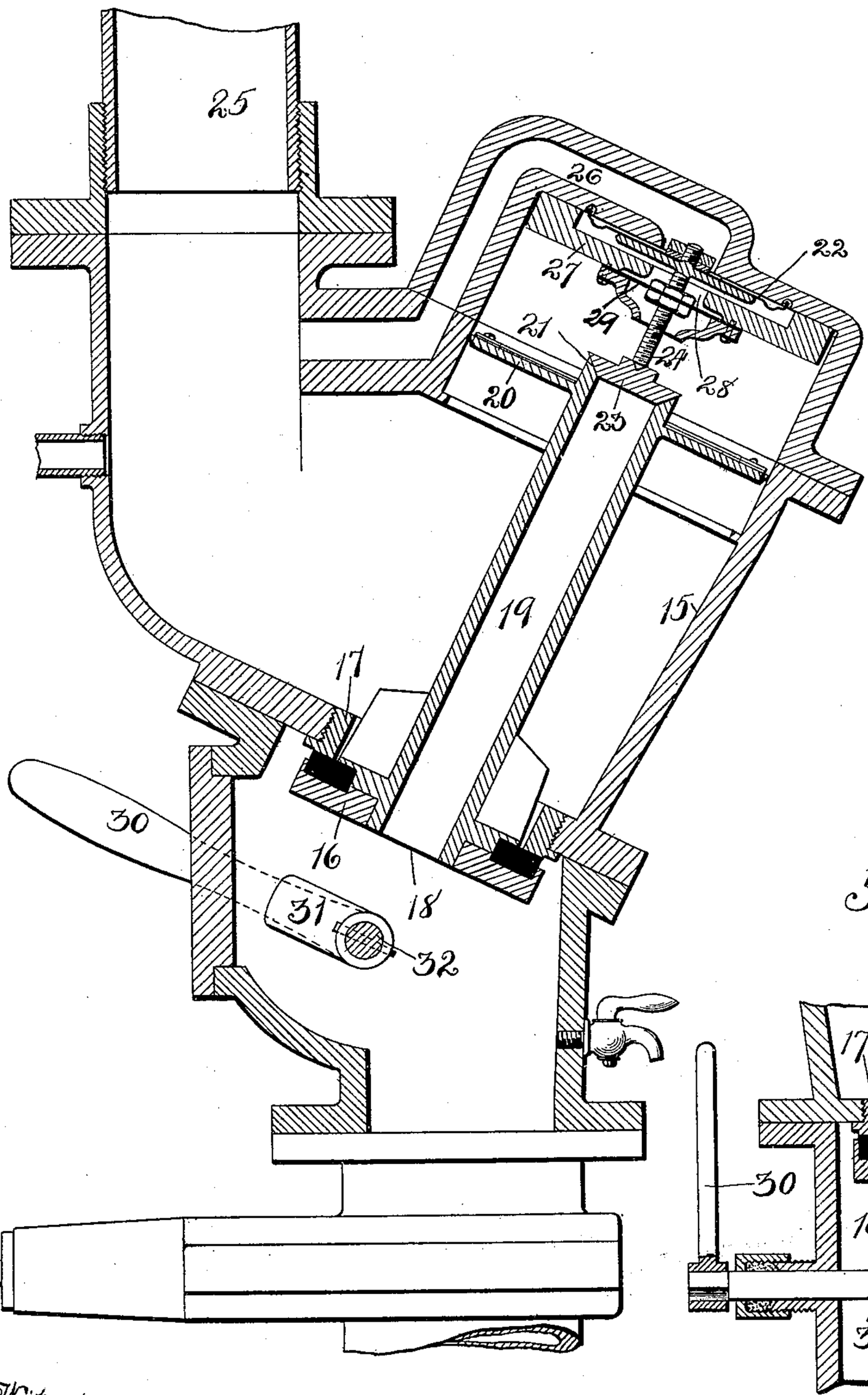
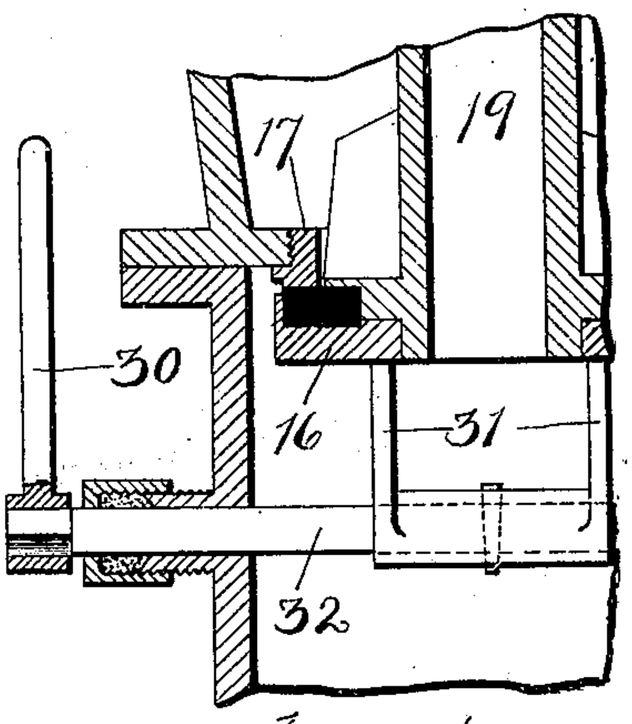


Fig. 2.



Witnesses:
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UNITED STATES PATENT OFFICE.

FRANK GRAY, OF CHICAGO, ILLINOIS.

VALVE APPARATUS.

SPECIFICATION forming part of Letters Patent No. 635,771, dated October 31, 1899.

Application filed August 5, 1897. Serial No. 647,166. (No model.)

To all whom it may concern:

Be it known that I, FRANK GRAY, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Valve Apparatus, of which the following is a specification.

My invention relates to a form of valve of the character as shown and described by me in certain Letters Patent granted December 6, 1898, and numbered 615,354.

The particular feature of this my present invention resides in a construction by which the air-pressure is admitted both below and above the valve-piston.

Reference may now be had to the accompanying drawings, in which—

Figure 1 is a vertical sectional view of the valve and valve-casing. Fig. 2 is a like view showing the valve-locking device engaged.

The valve-casing is designated at 15, within which the various valves of the apparatus are disposed. The water-valve is designated at 16, finding its seat upon the valve-seat 17. A port 18 is provided centrally in the water-valve 16, connected by the hollow spindle 19 with the piston 20, having also a central port 21 at the end of the hollow spindle 19 connected with said piston. A diaphragm 22 is connected by the spindle-valve stem 24 with the spindle-valve 23, and this valve is normally held to its seat, closing the port 21 by means of the diaphragm 22, which is exposed to the pressure of the dry-pipe system. The air-pressure is normally maintained within the pipes 25, leading to the automatic sprinklers, a passage 26, communicating with the pipe 25, conveying the air-pressure to and above the diaphragm 22. As the air-pressure in this my present form is below the piston 20, it is necessary to provide means for shielding the lower side of the diaphragm from the influence of the air-pressure. If the diaphragm were exposed to the air-pressure on both sides, it could not normally hold the spindle-valve 23 in a closed position. In order to cut off the air-pressure below the diaphragm, I provide an inclosing or separating partition 27, secured at its ends to the casing, the partition being centrally apertured at 28 and cut out to admit the diaphragm 22. A sheet of flexible material 29 is provided, secured to the spindle-valve stem 24, which sheet is secured to the partition 27. This yielding sheet 29 permits a movement of the spindle-valve stem 24 when the spindle-valve 23 opens; but in effect closing the aperture 28 cuts off the air-pressure below the diaphragm 22. The piston 20 exposes a greater surface area to the water-pressure than the valve 16, and therefore when the spindle-valve 23 is opened the water-pressure passes through the hollow spindle 19 and acts upon the piston 20, which then opens the water-valve 23 to admit the water-pressure.

The device for closing and locking closed the valve 16 consists of a lever 30, manually operated from the exterior of the valve-casing and having a cam-arm 31 mounted upon a shaft 32, the cam-arm being swung into position against the valve 16 by the lever 30, thus closing the valve and holding it tightly in a locked position against its seat.

Having thus described my invention, what I claim as new therein, and desire to secure by Letters Patent, is—

1. In a valve apparatus, the combination of a water-valve, a piston, a hollow spindle connecting the water-valve and the piston, a spindle-valve and diaphragm connected therewith which spindle-valve normally remains in a closed position by virtue of the air-pressure on the diaphragm but which spindle-valve is opened by the water-pressure upon a predetermined reduction of air-pressure in the sprinkler-pipe together with a casing surrounding the under side of the diaphragm to shield it from the air-pressure admitted about the piston and above the water-valve.

2. In a valve apparatus, the combination of a water-valve, a piston, a hollow spindle connecting the water-valve and the piston, a spindle-valve, a diaphragm and a spindle-valve stem connecting the spindle-valve and diaphragm together, which spindle-valve normally remains in a closed position by virtue of the air-pressure on the diaphragm but which spindle-valve is opened by the water-

pressure upon a predetermined reduction of air-pressure in the sprinkler-pipe together with a casing surrounding the under side of the diaphragm consisting of a fixed partition and a flexible member held on the valve-stem whereby the one side of the diaphragm is shielded from the air-pressure.

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

FRANK GRAY.

Witnesses:
CHAS. C. BULKLEY,
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