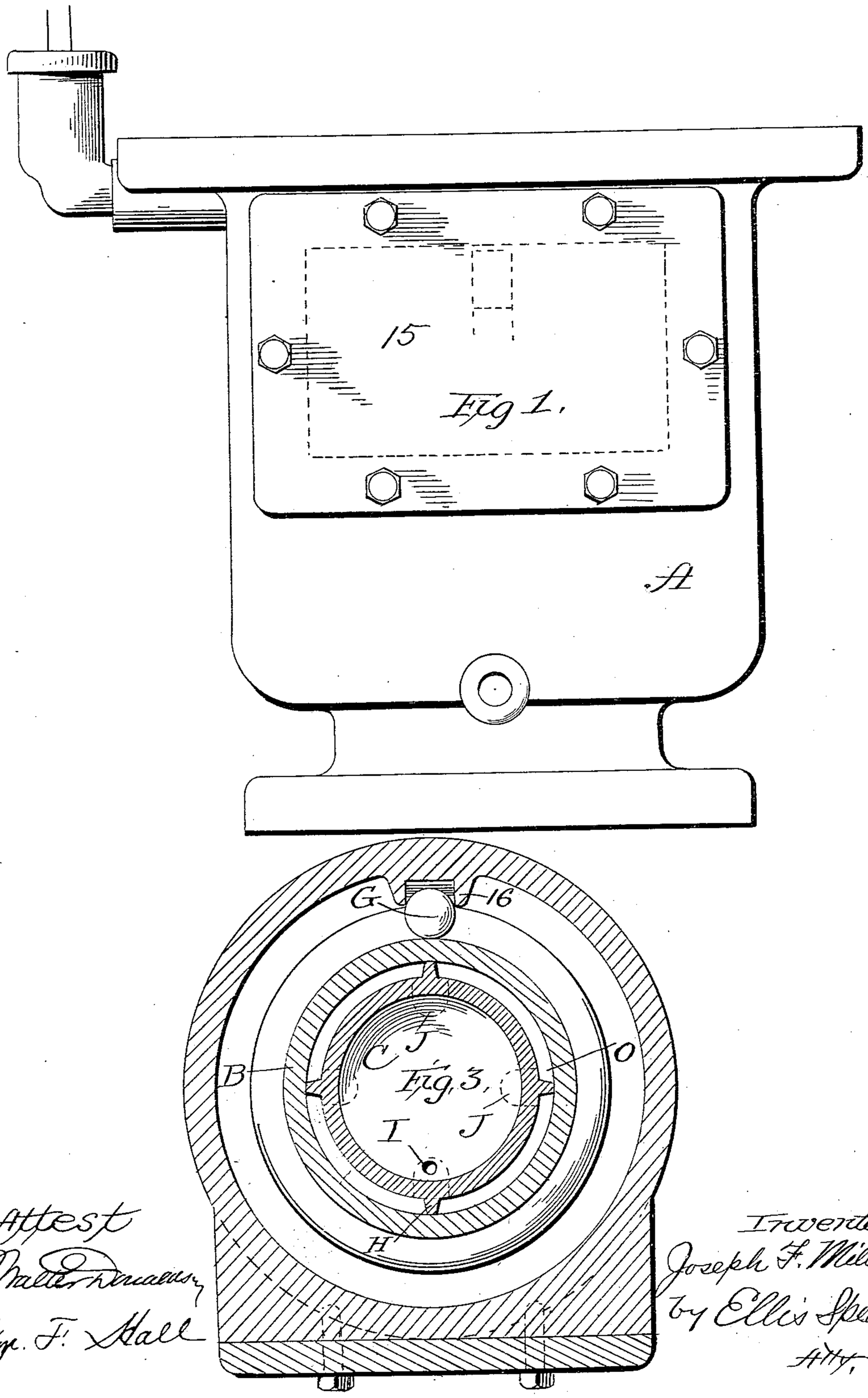
(No Model.) 3 Sheets—Sheet 1.

J. F. MILLER.

VALVE FOR FIRE EXTINGUISHING SYSTEMS.

No. 559,944. Patented May 12, 1896.



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(No Model.) 3 Sheets—Sheet 2.

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VALVE FOR FIRE EXTINGUISHING SYSTEMS.

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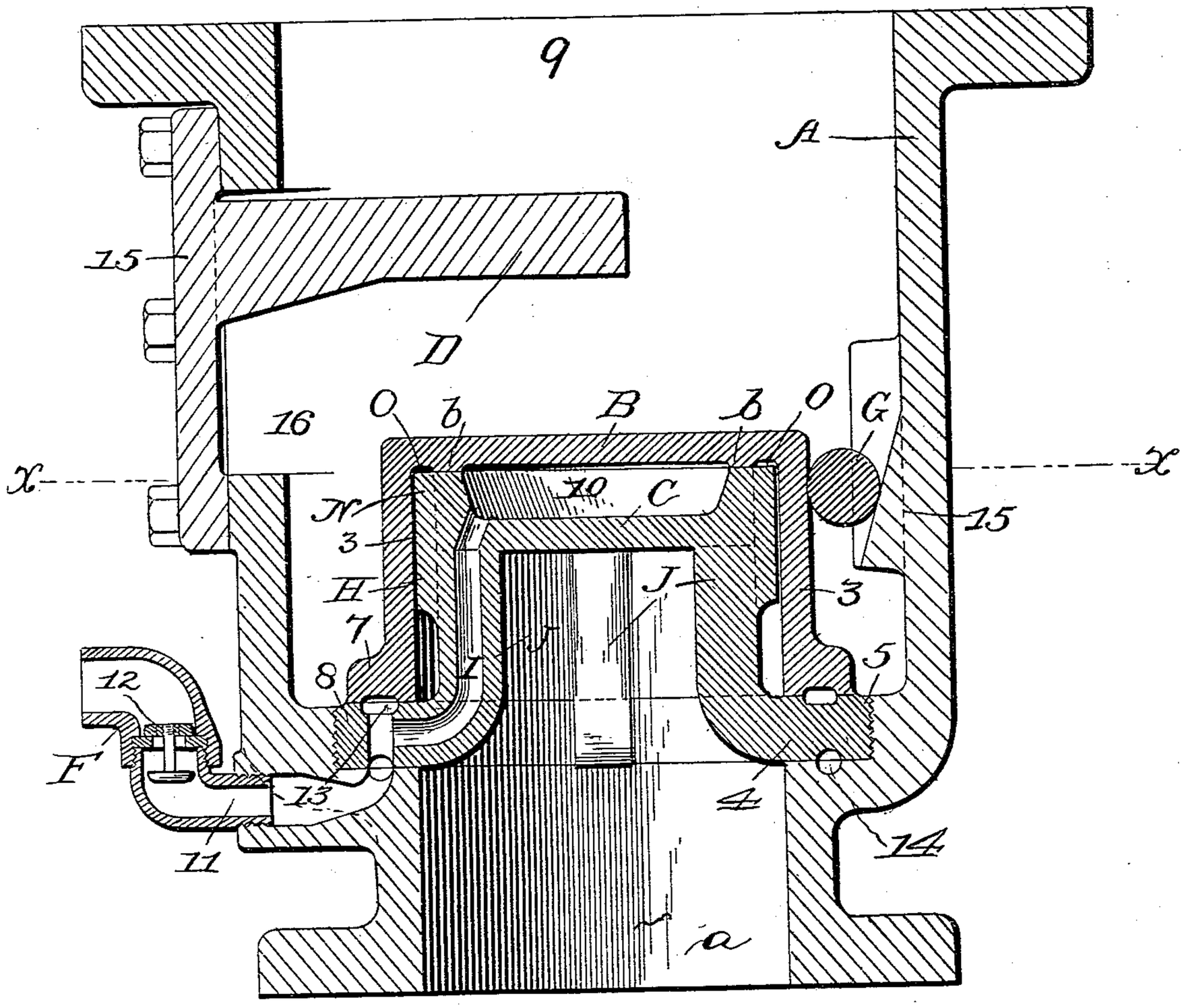
Fig. 2.



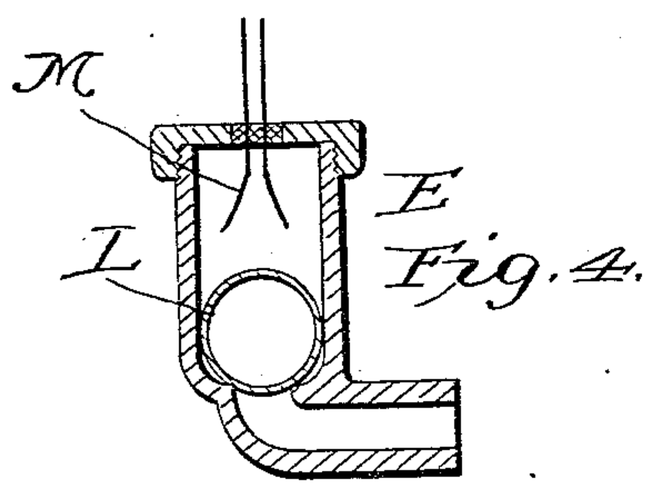


Fig. 4.

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VALVE FOR FIRE EXTINGUISHING SYSTEMS.

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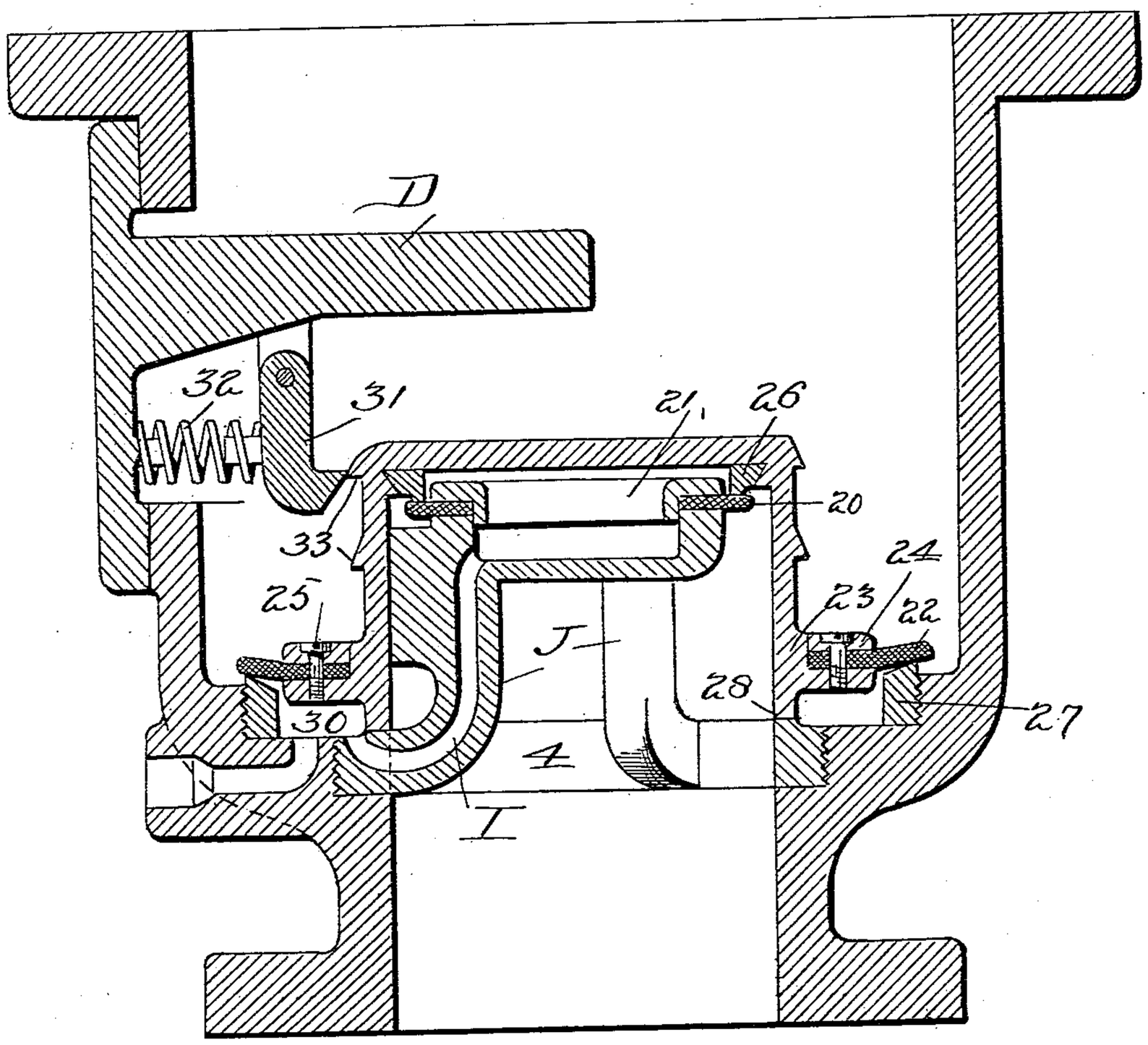
Fig. 5.



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UNITED STATES PATENT OFFICE.

JOSEPH F. MILLER, OF CLEVELAND, OHIO, ASSIGNOR OF ONE-HALF TO OTTO J. FREY, OF SAME PLACE.

VALVE FOR FIRE-EXTINGUISHING SYSTEMS.

SPECIFICATION forming part of Letters Patent No. 559,944, dated May 12, 1896.

Application filed January 17, 1895. Serial No. 535,291. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH F. MILLER, a citizen of the United States of America, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Valves for Fire-Extinguishing Systems, of which the following is a specification.

My invention relates particularly to an automatic air-valve adapted to dry-pipe fire-extinguishing systems, and is designed to provide a valve which may be maintained upon its seat with certainty and will be sensitive in operation when the air-pressure is relieved.

My invention comprises a valve in the form of a hood having upper and lower bearings in contact with upper and lower seats, the upper seat being formed by a stationary disk arranged to normally shield the under side of the valve from water-pressure, with the exception of a small surface, the entire upper side of the valve being exposed to the air-pressure in the system to hold the valve closed against the water-pressure on the small exposed under surface.

My invention includes the manner of draining the valve-seats, locking means arranged to hold the valve when operated in its open position, and in various features of construction and arrangement hereinafter pointed out.

In the drawings, Figure 1 is a side view of the valve-case. Fig. 2 is a sectional view of the same; Fig. 3, a plan view of a section on line *x x* of Fig. 2. Fig. 4 is a detail view of the automatic alarm. Fig. 5 is a sectional view of the preferred form of my invention.

The valve consists of an upper plate and the depending annular wall or flange forming a hood B. On the under side of the upper plate a rib *b* is formed to bear on the seat N on the edge of a dish-shaped disk C, arranged centrally of the hood-valve and shielding the greater portion of the under surface thereof from the water-pressure entering through the inlet-opening *a* of the valve-case A. The portion of the valve-surface exposed to the water-pressure when the valve is seated is the small portion marked O between the bearing-rib *b* and the depending wall or flange 3 of the hood. The disk C is formed with four arms J extending down, having their lower outwardly-curved ends connected to the ring 4, screwed into the valve-casing at 5. The disk C has ribs H projecting therefrom to bear on the flange of the hood and thus hold the same in central position. The annular wall of the hood-valve has a lateral flange 7, bearing on the seat 8 of the ring 4. The hood-valve thus extends entirely over the central shield or disk and its arms and closes the water-passage by bearing on the upper and lower seats, being held by the air-pressure against the entire upper surface of the hood, the relation between the sizes of the upper and lower pressure-surfaces being such that an air-pressure of ten pounds in the system will hold the air-valve against a water-pressure of one hundred pounds. When the air-pressure is reduced by reason of the release of the sprinklers due to heat, the pressure of the water on the annular surface O will lift the hood-valve from its seats, thus allowing the water to flow through the openings between the arms J, around the central disk or shield and the hood-valve, and through the outlet 9 into the system. The upward movement of the hood is limited by the stop D, projecting inwardly from the valve-casing.

A drain-conduit I extends through one of the arms J from the cavity 10 of the dish-shaped shield and leads off any water which may leak between the upper valve-seat and rib *b*. This conduit extends through the ring 4 and connects with the channel 11, leading through the valve-casing and connecting with the valve-box F, containing the drain-valve 12. The lower valve-seat has a channel 13, connecting with the drain I to drain the lower seat, and a third drain 14 is provided between the screw-ring and the casing connecting with the channel 13, by which any leakage through this joint is led off. As soon as the valve begins to open it is locked in its different positions against closing by the locking-roller G engaging the same and bearing on the incline 15 on the casing between the guiding-ribs 16.

The alarm consists of a ball or float L in the casing E, connected with the interior of the valve-casing to receive the water therefrom when the valve is opened, so that the

ball will be lifted to contact with the terminals M M, thus closing the alarm-circuit.

The air-valve casing may be primed with a small quantity of water covering the air-valve.

The stop for limiting the rise of the hood-valve is formed on a plate 15, secured over the opening 16 of the valve-casing.

In Fig. 5 I show the preferred form of my valve, in which, instead of having upper and lower rigid seats, I arrange the upper yielding seat 20, composed of flexible material or rubber, between the upper surface of the central shielding-disk and the clamping-ring 21, and also a lower flexible or yielding seat composed of a rubber or like ring 22, held on the lateral ledge 23 of the hood by a clamping-ring 24, held thereto by screws 25. The upper flexible seat is borne upon by the bearing 26 on the hood, of block tin, adapted to prevent the rubber from adhering to the same. The lower seat bears on a similar ring 27, screwed into the casing. Besides these flexible seats, the lower edge of the hood bears at 28 on the ring 4, this being a solid bearing. Only three arms J are used in this form, the channel I being continued through the space 30 beneath the lower flexible seat. The locking means in this instance comprises the pivoted catch 31, pressed inwardly by the spring 32 to engage a series of lugs or teeth 33 on the sides of the hood. The catch is carried by the lug D.

I claim—

1. A valve for dry-pipe or like systems of fire-extinguishers comprising a casing connected with the system and containing air under pressure, a valve having a top exposed to said pressure, a shield for the under side of said top to protect the same from the water-pressure and means for supporting the shield, consisting of the arms extending upwardly within the casing and the ring to which the arms are attached, the said valve having depending sides to close the openings between the arms, substantially as described.

2. In combination, the casing, the shield or disk having the valve-seat, the valve engaging the seat, the supporting-arms for the disk and the drain-conduit leading from the valve-seat through one of the said arms, said valve having a depending side or body portion closing the water-passages between the arms, substantially as described.

3. In combination, the casing, the valve of hood form, the dish-shaped disk acting as a shield for the valve and having the valve-seat the drain and leading from the dished portion of the disk, and the seat for the lower part of the hood-valve, substantially as described.

4. In combination, the casing, the valve in the form of a hood with a top plate and side wall, the shield having the upper seat, the arms supporting said shield, the lower seat for the side walls and the drains leading from said seats, one of said drains extending through one of the supporting-arms, substantially as described.

5. In combination, the casing, the disk or shield having supporting-arms and a ring secured in the casing and to which said arms are attached and the hood-valve bearing on an upper seat of the disk and upon the lower seat of the ring, the said hood-valve closing the lateral water-passages between the supporting-arms, substantially as described.

6. In combination in an automatic air-valve, the casing, the valve in the form of a hood, the disk having an upper seat, the arms connecting the disk and ring therefor, the ring having the lower seat and the drains leading from the upper and lower seats and from the joint between the ring and casing, substantially as described.

7. In combination, the casing, the shield or disk, the hood-valve extending over the same and the locking means engaging the vertical side of the hood directly substantially as described.

8. In combination, the valve of hood form, the shield, the seats for the valve, the stop, the removable plate carrying the same and the pivoted catch also carried by the plate and arranged to lock the hood-valve in position, substantially as described.

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

JOSEPH F. MILLER.

Witnesses:
E. H. BOHM,
J. W. FRANCISCA.