P. EVANS.

DRY PIPE VALVE.

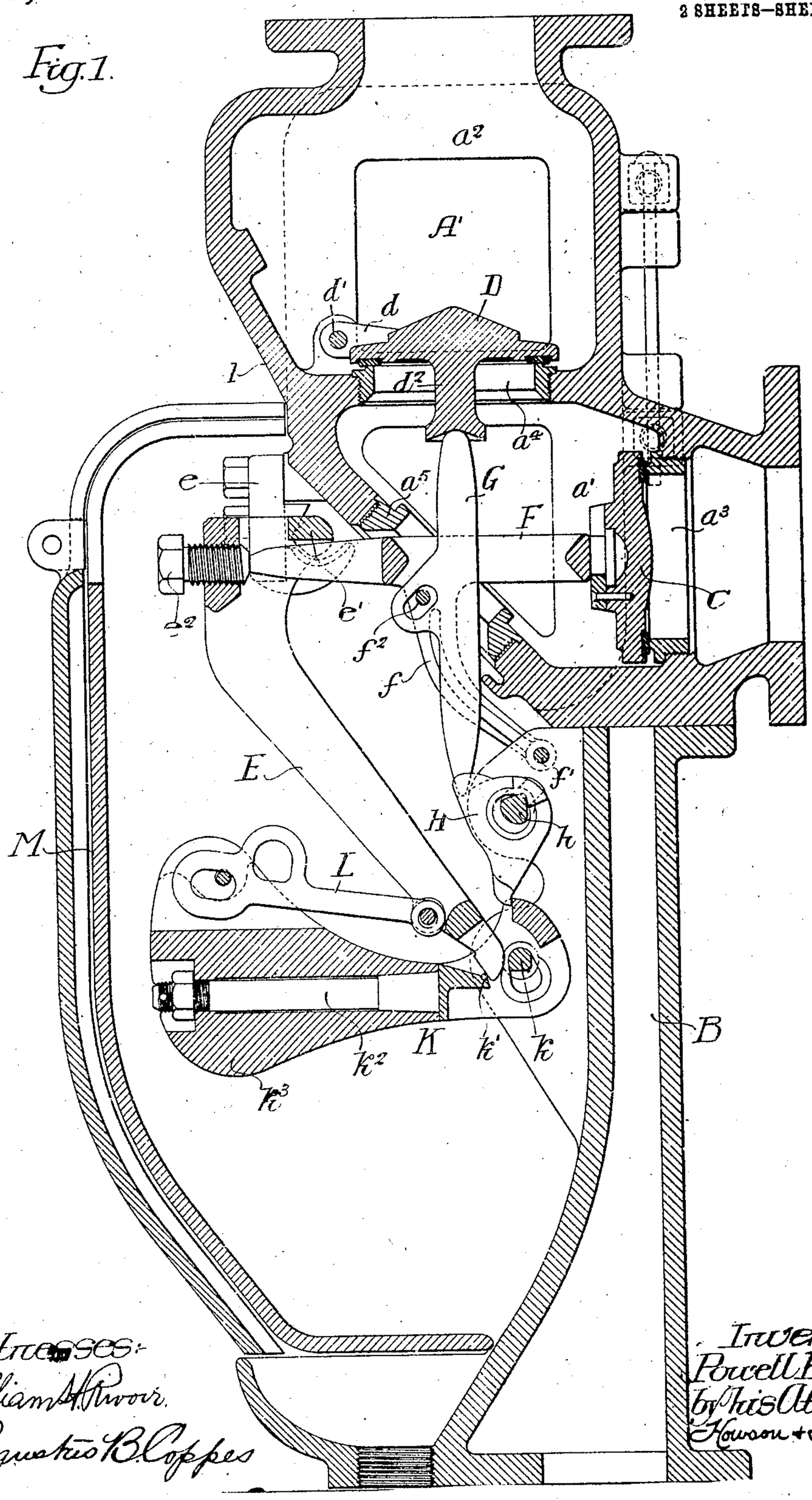
APPLICATION FILED DEC. 4, 1907.

898,856.

Patented Sept. 15, 1908.

2 SHEETS—SHEET 1.

Fig. 1.




Witnesses:-
William A. Rivoir.
Augustus B. Coppes

Inventor:-
Powell Evans.
by his Attorneys
Howson & Howson

P. EVANS.

DRY PIPE VALVE.

APPLICATION FILED DEC. 4, 1907.

898,856.

Patented Sept. 15, 1908.

2 SHEETS—SHEET 2.

Fig. 3.

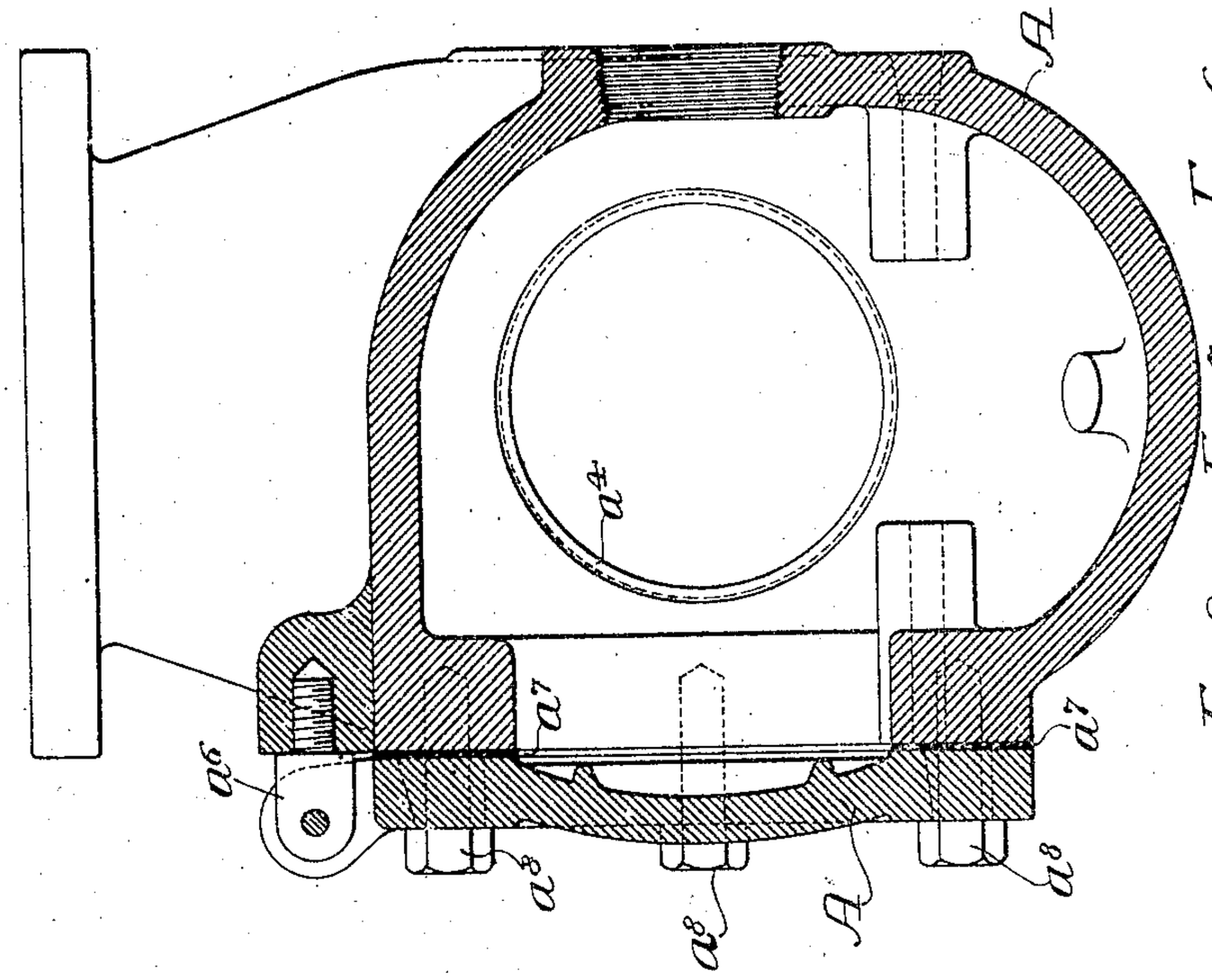



Fig. 4.

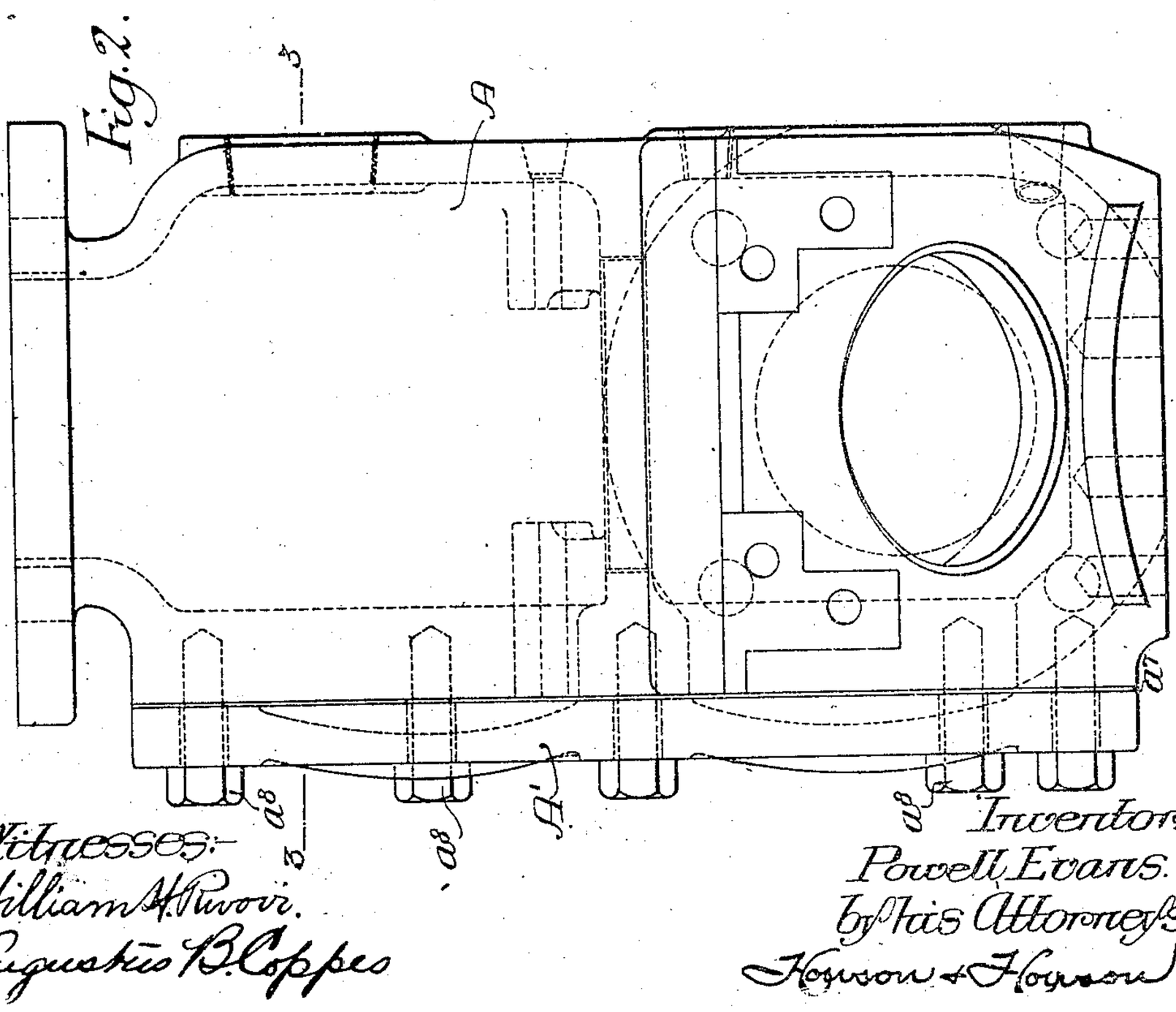

Fig. 5.




Fig. 6.




Fig. 2.




Witnesses:-
William A. Rowe.
Augustus B. Coppes

Inventor:-
Powell Evans.
by his Attorneys,
Howson & Howson

# UNITED STATES PATENT OFFICE.

POWELL EVANS, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO INTERNATIONAL SPRINKLER CO., OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

## DRY-PIPE VALVE.

No. 898,856. Specification of Letters Patent. Patented Sept. 15, 1908.

Application filed December 4, 1907. Serial No. 405,086.

*To all whom it may concern:*

Be it known that I, POWELL EVANS, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Dry-Pipe Valves, of which the following is a specification.

One object of my invention is to provide a valve of the general type described and claimed in my Patents Nos. 695,294, dated March 11, 1902, and 731,877, dated June 23, 1903, which shall possess certain improvements in the detail construction of its mechanism, with the idea of making the device as a whole more efficient and certain in its action, as well as simpler in construction than heretofore. These objects I attain in the following manner, reference being had to the accompanying drawings, in which:—

Figure 1, is a vertical section of my improved valve; Fig. 2, is a rear elevation of the body of the valve; the various levers, etc., constituting its mechanism being omitted; Fig. 3, is a horizontal section taken on the line 3—3, Fig. 2, and Figs. 4, 5, and 6, are vertical sections illustrating some of the various forms which may be given to the bearing piece between certain portions of the mechanism employed in my valve.

In the above drawings, A represents the main casting or body of the valve which is normally carried upon a foot casting B and is divided into chambers $a$, $a'$ and $a^2$. Between the first two of these is placed a valve seat $a^3$ and between the last two is a second valve seat $a^4$, while the chamber $a'$ has in its rear wall an opening in which is set a third valve seat $a^5$. The main casting has an inlet opening into the chamber $a$ and is provided with two valves C and D, of which the first is capable of engaging either of the valve seats $a^3$ or $a^5$, while the second is provided with an integral lug or projection $d$ and a pin $d'$ whereby it is mounted in the chamber $a^2$ so as to be capable of engaging the seat $a^4$. The main casting A also has in one side openings into the chambers $a'$ and $a^2$ and these are both normally closed by a single cover plate A', which is, as shown in Fig. 3, hinged to suitable lugs $a^6$ screwed into said main valve casting. Between said cover and the valve body A is placed a gasket $a^7$ and said cover is normally maintained in position to close the two openings into the chambers $a'$ and $a^2$ by means of bolts $a^8$.

A bracket $e$ is bolted to the outside of the main casting A and is so made as to provide a seat for a knife edge $e'$ fixed to a lever E which is ordinarily known as the hook. This lever has extending through it a set screw $e^2$ and there is provided a compression member F mounted on a pair of arms $f$ pivoted to the foot casting B at $f'$ which is designed to transmit pressure between the valve or clapper C and the lever E through this set screw. Said member F is rigidly fixed to the clapper C and is slotted at its middle portion to permit of the passage of a second compression member or strut G, to which is loosely connected a pin $f^2$ extending through a slot in said strut.

A small lever H known as a "tumbler" is mounted upon a knife edge $h$ carried by the foot casting B and is so constructed that one of its arms is capable of engaging the lower end of the strut G. The valve D has a projecting portion $d^2$ on its under face in which is a concave recess for the reception of the upper end of this same strut. A third lever K is mounted upon a pin $k$ supported by the foot casting B and has an arm placed to be engaged by the second arm of the lever constituting the tumbler H. There is also mounted upon this third lever and held to it in any suitable or desired manner a piece $k'$, preferably though not necessarily of cylindrical form, which extends substantially parallel to the axis of the pin $k$. This bearing piece is so placed as to be engaged by the long or downwardly extending arm of the hook E, which, as shown in Fig. 1, is preferably made plane at its end so as to engage tangentially with the bearing piece $k'$. The head or main portion of the lever K has an integral arm $k^2$ upon which is mounted a weight $k^3$ held in place by a nut. In addition, a connecting link L extends from the lower end of the hook E to the upper portion of the weight $k^3$, being pinned loosely to both of these elements. That portion of the mechanism above described which is outside of the main valve body is inclosed within a two-part casing M.

As is well understood by those skilled in this art, under conditions of use the various parts are in the positions illustrated in Fig. 1, and the valve is so connected to the other parts of a dry pipe system that water under pressure is admitted to the chamber $a$, but is prevented from moving the valve C, by air pressure exerted upon the valve D and transmitted therefrom through the strut G, tum-

bler H, weight-lever K, hook E, and compression member F. If for any reason the pressure within the chamber $a^2$ falls below a predetermined point, the weight lever K, as well as the air pressure against the valve C, acts to lift the valve D. When the various parts are so moved that the valve C is caused to engage the valve seat $a^5$, it will completely close off the chamber $a'$ from the atmosphere. Water is now free to pass from the chamber $a$ through the chamber $a'$ and into the chamber $a^2$; the valve D being swung upward and back on its hinge pin. It is to be noted that the upper part of the main casting A is extended to the rear, thereby enlarging the chamber $a^2$ sufficiently to permit the valve D to lie completely to one side of the current of fluid passing through the valve structure.

It will be noted that by the use of a cylindrical bearing piece $k'$ the surface of contact between the hook E and the weight lever K is reduced to a minimum, the leverages are made constant, and the turning of the weight lever on its pivot when the movement of the valve D causes it to be released from the tumbler, is greatly facilitated.

By the provision of a single door or cover for closing the two openings in the chamber $a'$ and $a^2$ on the side of the main casting, the construction is materially simplified and the labor of getting into the valve for the purposes of inspection etc., is materially lessened. By making the weight $k^3$ separate or removable from the balance of the weight lever, I am enabled to make it of relatively cheap material, such as lead or cast iron, and yet at the same time construct those parts of the lever which are subject to strain and possible corrosion, of stronger, non-corrosive material such as bronze. As is obvious, the manner of assembling the parts of the weight lever is a relatively simple operation.

While in Figs. 1 and 4 I have shown the preferred form of the bearing piece $k'$ employed between the hook E and the weight lever K, I may, if desired, use bearing pieces of other forms such as those shown at $k^5$ in Fig. 5, or $k^6$ as shown in Fig. 6; it being necessary in any case that there be but a line bearing between the bearing piece and the hook E and that the distance of this line bearing from the axis of movement of the weight lever K remains constant irrespective of the position of said lever.

I claim:

1. The combination in a dry pipe valve of a casing, a plurality of valves controlling the flow of fluid through said casing, and mechanism operatively connecting said valves, said mechanism including a plurality of levers of which one is composed of a non-corrodible metal, with a weight made of some other metal rigidly connected to said latter lever.

2. The combination in a dry pipe valve of a casing, a plurality of valves controlling the flow of fluid through said casing, and mechanism operatively connecting said valves, said mechanism including a connecting lever having a bolt-like extension, with a weight separate from but mounted on said extension.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

POWELL EVANS.

Witnesses:
WM. E. WATERS,
W. CLAYTON NEWBOLD.