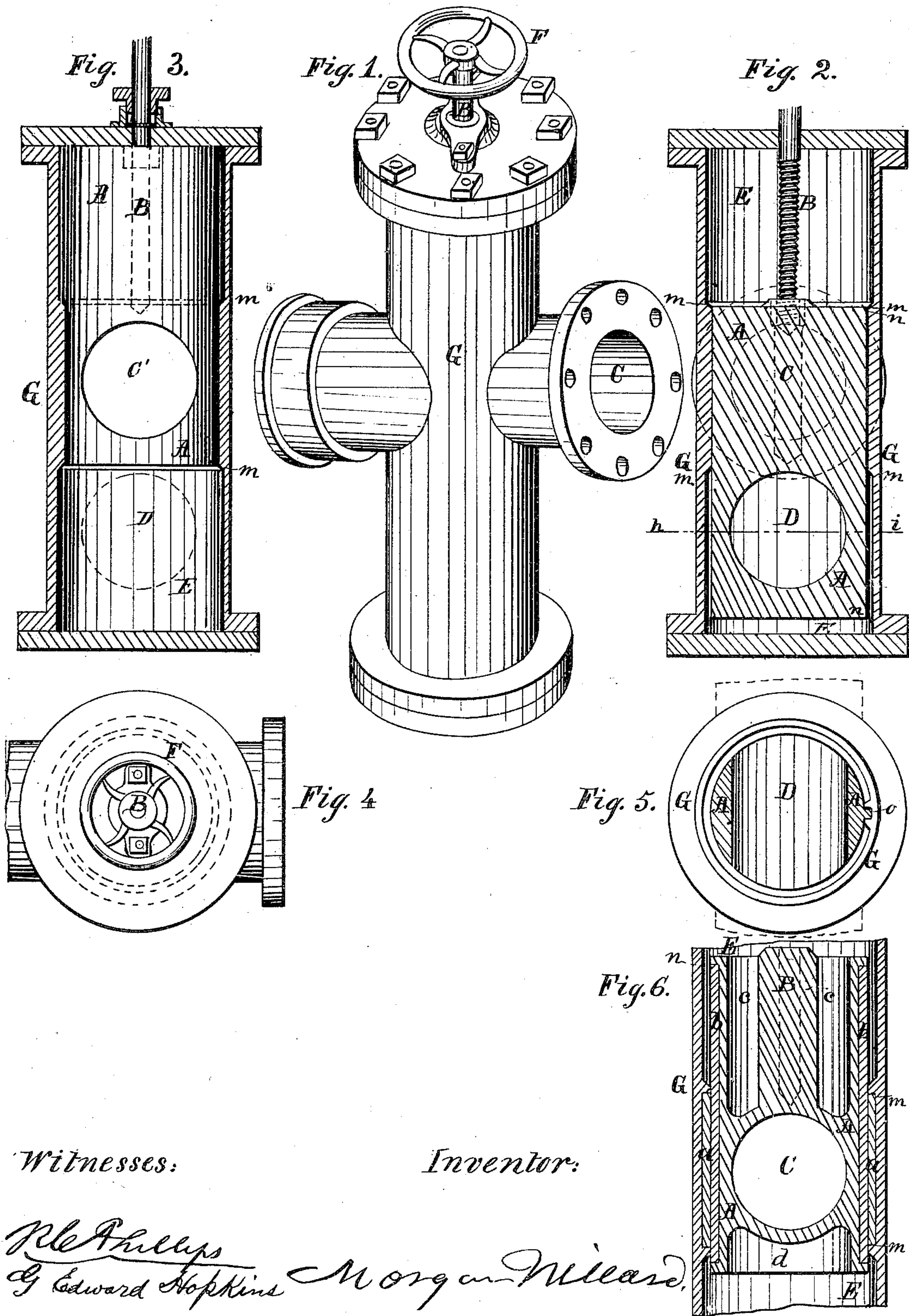


M. WILLARD.
STOP-VALVE.

No. 172,359.

Patented Jan. 18, 1876.



Witnesses:

Inventor:

Edw. Phillips
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UNITED STATES PATENT OFFICE.

MORGAN WILLARD, OF CINCINNATI, OHIO.

IMPROVEMENT IN STOP-VALVES.

Specification forming part of Letters Patent No. 172,359, dated January 18, 1876; application filed July 12, 1875.

To all whom it may concern:

Be it known that I, MORGAN WILLARD, of the city of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain Improvements in Stop-Valves for Water, Steam, Gas, and Hydraulics, of which the following is a specification:

My invention relates to those devices employed in wholly or partially stopping the flowage of fluids through pipes or other passages, commonly known as stop-valves; and consists in so constructing the valve and its passages as to allow, when open, the same form and size of opening through the valve-passage as through the adjacent pipes; in other words, my valve, when open, affords a continuation of the bore of the pipe without change of figure or size. This I effect in the following manner, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of one of my valves, one of the branches being flanged, the other a socket-pipe, either of which may be used. Fig. 2 is a cut section, showing the valve closed. Fig. 3 is a similar section, showing the valve open. Fig. 4 is a plan, showing the manner of actuating the valve usually, though any other device suitable for the purpose may be used. Fig. 5 is a plan of the valve through *h i*. Fig. 2 and Fig. 6 is a section, showing the mode of coring the valve or plug A, so as to save metal in large valves, and at the same time lessen the weight, as shown at *c c* and *d*, Fig. 6.

The same letters refer to the same things in all the drawings.

A A is the plug or cylinder of such length as to allow the opening C', Figs. 3 and 6, to be cast through it of the size and form of the pipe C, Fig. 1, at such a distance from its lower end as to form sufficient lap for a good joint, its upper end being of such length as to cover the opening C' and allow sufficient lap to secure a good joint above and below C' when shut off or closed, as shown by A A, Fig. 2, C' in that figure being carried down to the positions shown at D D, Figs. 2 and 3.

In small valves the outside casing G, as well as the branches, are sometimes composed of brass, but generally of iron, and always of iron when large. Sometimes I line the shell

G with brass from *m* to *m*, or I recess it, as shown at *a a*, Fig. 6, and line it with Babbitt or other suitable metal. In like manner I recess the valve A A, as shown at *b b*, Fig. 6, and fill this recess with similar metal, or in any cheap and convenient manner form a simple but accurate hollow cylinder in G from *m* to *m*, and similarly form a simple but exact plug, A A, fitting it by a water, steam, or gas joint, and through the sides of G cut the openings C, and through the plug A A the opening C', as shown at C', Fig. 3, in section, and in plan, Fig. 5, D in this figure being the opening through A A, and the dotted lines showing the openings C through the walls of G, A A in this figure being the portion of the plug not cut away by C'. A small hole drilled through the wall or side of G, or a small cock inserted, will allow the water or other fluid that may accumulate above and below the plug to escape, and thus allow the plug to move up or down easily.

From the above it will be seen that when the opening C' is brought into line with the pipes, whose openings are shown by C, a continuous line of pipe of uniform opening, without any bends, shoulders, or recesses is formed. A small stop or projection, *o*, on the upper end of A A traverses in a groove in the cylinder G, as shown at *o*, Fig. 5, for the whole length of the movement of A A, thus preventing A A from revolving, while a suitable stop in the cap of G secures the stoppage at the proper height.

The operation is as follows: The valve is moved up and down by the screw B, put in motion by means of the hand-wheel F, and brought to the proper height, when a continuous pipe will be formed through the valve, and by reversing the screw the plug A A will be forced down so as to bring the solid portion of it over the openings C, thus forming a complete stop, and, if well fitted, a perfectly-tight valve.

I thus secure a cheap, durable, and convenient valve, possessing the important condition of a continuous and uniform section through the valve, exactly the same as in other portions of the pipe.

I claim as new and of my invention—

1. The hollow cylinder G, with its branches,

in combination with the plug or solid cylinder A A, having an opening or passage-way through it corresponding in size and form to or with the openings through the walls of the hollow cylinder G and its branches, and so arranged that when open the passage through the valve shall be a continuation of the influent and effluent pipes in which the valve or plug A A forms the stop.

2. The solid plug or cylinder A A, of uniform diameter, and so fitted and arranged that it can be moved to and fro in the hollow cylinder G, so as to bring the solid portions of the plug A A over the openings in the external cylinder G, thus closing them effectually, and

producing a complete and perfect stop-valve, said openings in A and G, respectively, being of such form and so arranged that when the valve is fully opened the port or passage-way through the valve shall be a section of the pipe in which it is placed as a stop of the same size and form as the opening in the pipe, without pockets or recesses in which sediment or other foreign matter may lodge, substantially as set forth and described herein.

MORGAN WILLARD.

Witnesses:

R. C. PHILLIPS,

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