

W. H. WARD.
Three-Way Cock.

No. 230,371.

Patented July 20, 1880.

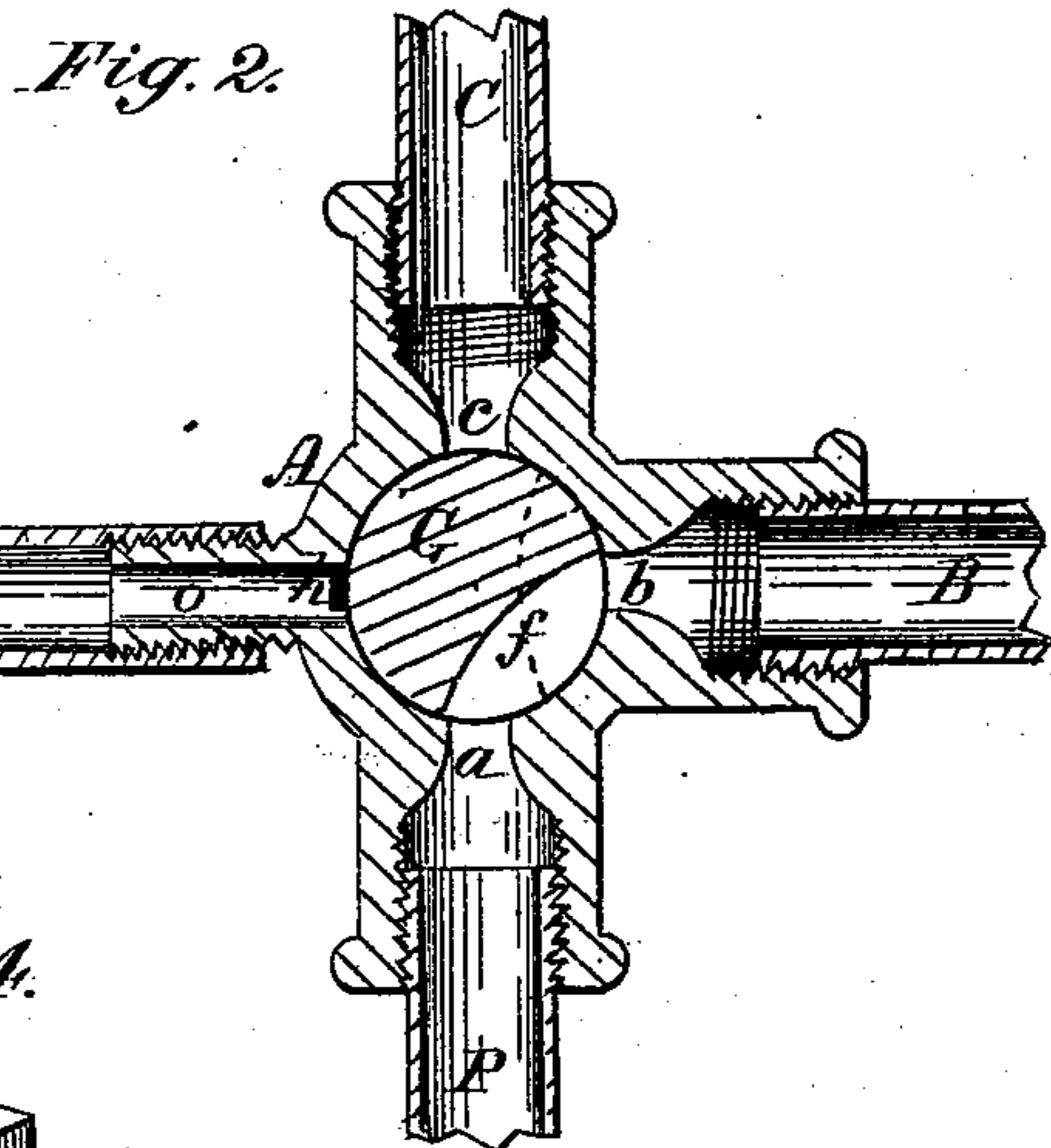
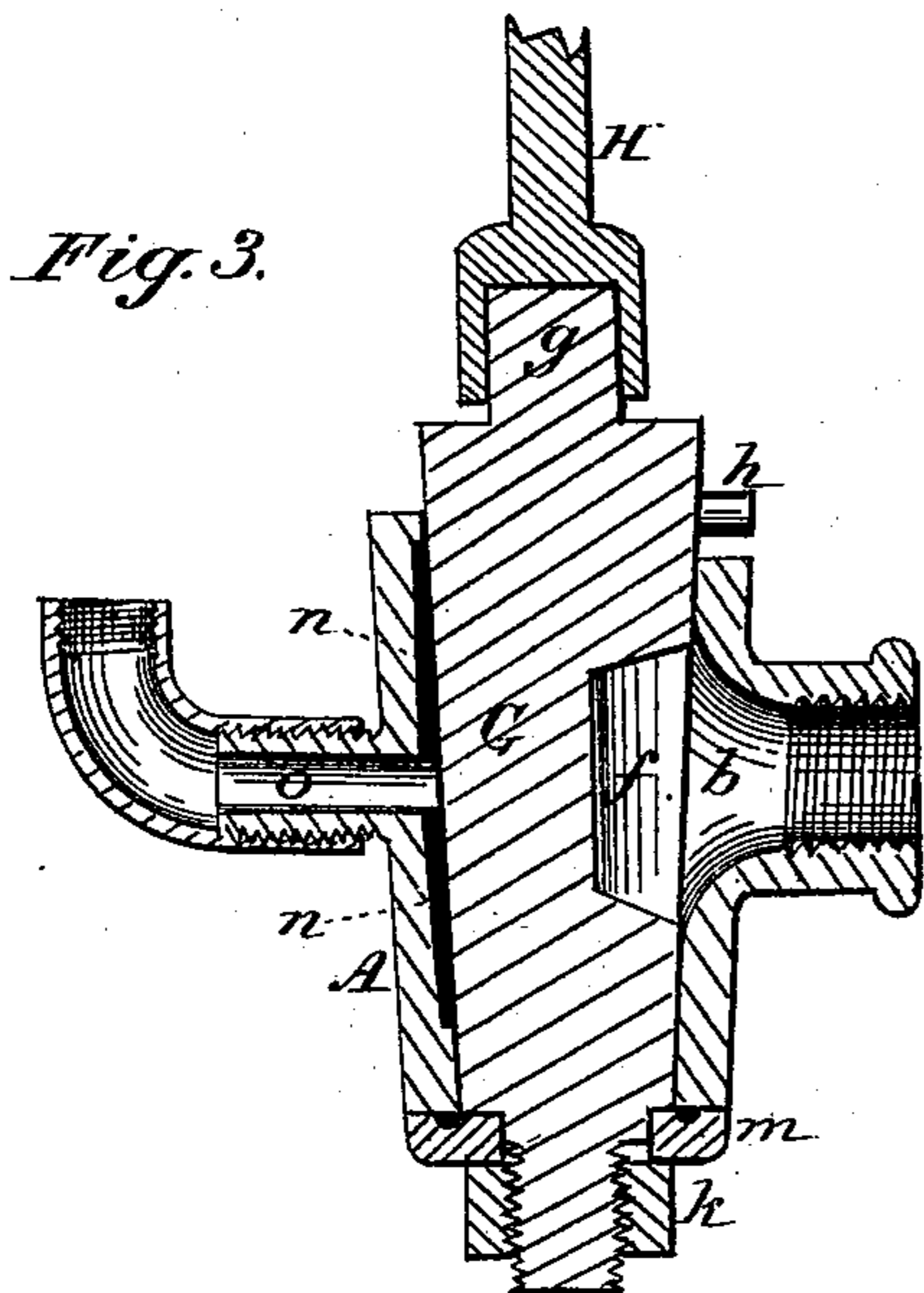
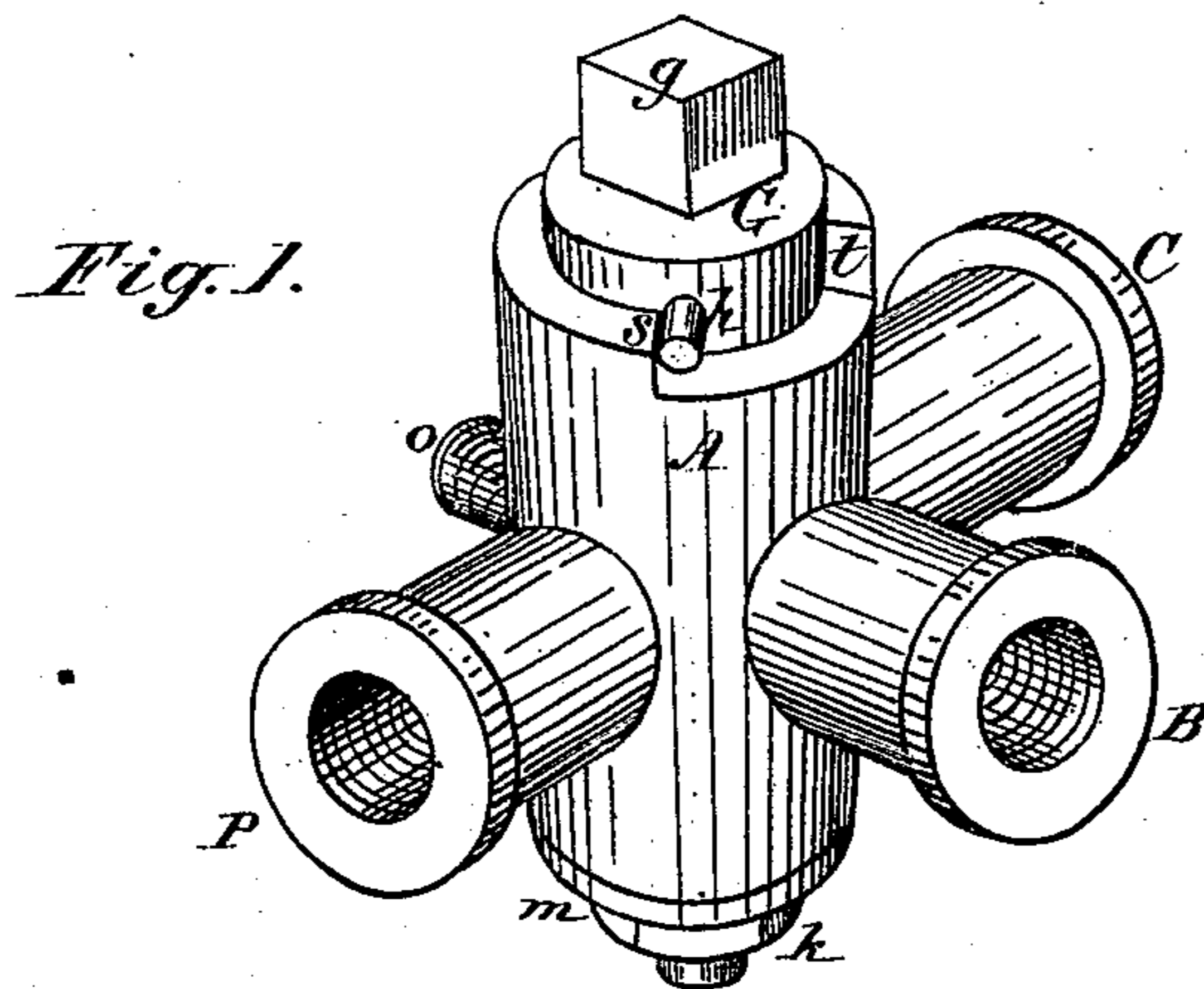
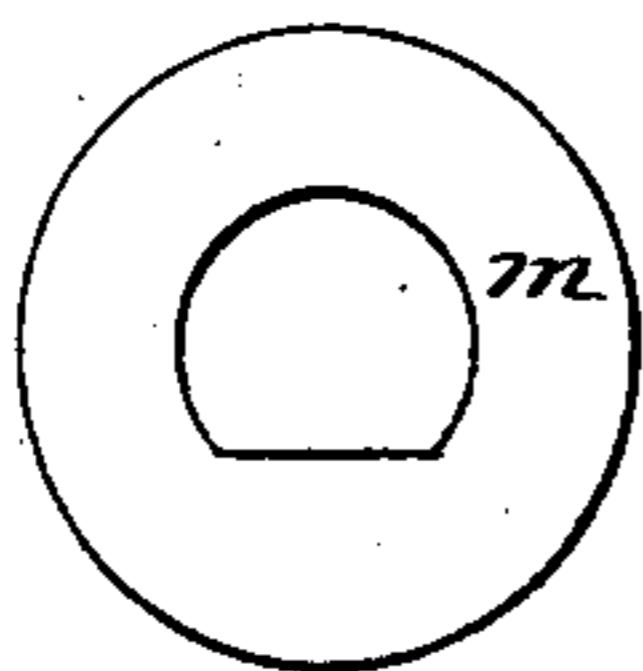
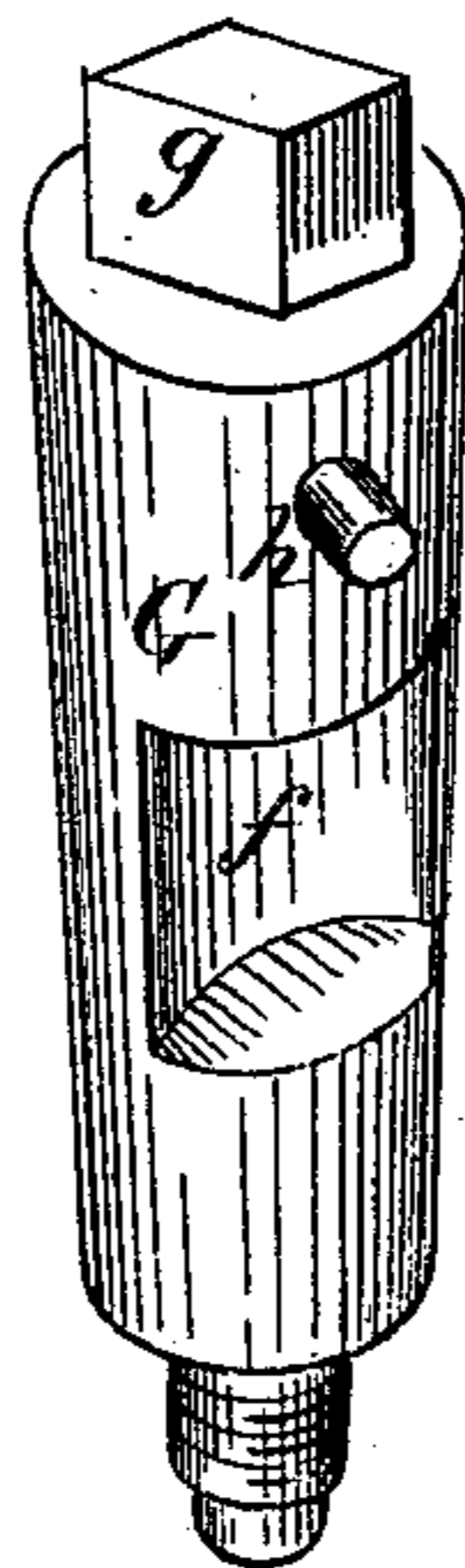


Fig. 4.



Witnesses:

D. Lloyd Harris
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Inventor:

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Attys

UNITED STATES PATENT OFFICE.

WILLIAM H. WARD, OF PITTSBURG, PENNSYLVANIA.

THREE-WAY COCK.

SPECIFICATION forming part of Letters Patent No. 230,371, dated July 20, 1880.

Application filed January 19, 1880.

To all whom it may concern:

Be it known that I, WILLIAM HENRY WARD, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improved Three-Way Cock, of which the following is a specification.

The object of my improvements in three-way cocks is to prevent leakage and obtain a large covering for the ports, by giving a large wear-surface to the plug between the ports, thereby avoiding the perforating or mortising of the plug or cock, as heretofore. The said improvements were also made with the design of lubricating the cock or plug throughout its wearing-surface, so that pressure upon it cannot cause it to become cut at its joining with the sharp edges of the port-walls or otherwise.

The invention was made with special reference to finding a suitable means for connecting the source of supply with the piston and cylinder in the operation of the Ward brake, and for receiving and discharging the steam, so as to put on or relieve the pressure of the brake, or for whatever else it may be used, the intention being to put the article on the market as a three-way cock.

In the accompanying drawings, Figure 1 represents a view, in perspective, of a three-way cock embracing my invention; Fig. 2, a horizontal section; Fig. 3, a vertical longitudinal section, and Fig. 4 the plug.

The shell A is made with three ports, *a b c*, the one, *a*, in the example shown communicating with the boiler or feed connecting-pipe P, and the one, *b*, with the pipe B, which goes to the cylinder, and the one, *c*, to a let-off or escape, C, as shown in the drawings.

Let it be remembered that while I describe this three-way cock with reference to its action in the case of my brake, I do not confine its principles and actions to such brake, as it may have a variety of offices.

The said shell is tapering to correspond to the shape of the plug G, which has an excavation, *f*, in its periphery equal to about one-third its circumference, leaving about two-thirds for wearing-surface and for closing the ports, &c. This excavation may be scalloped out or cut radially. I prefer the scalloped form as being the stronger. The depth of the excavation extends almost to the center of the

plug, or fully to said center, if desired, but in all cases must be equal to the passage of the ports.

By manipulating the plug on its axis it may be turned, as shown in Fig. 2, so that all the ports are closed, as the dotted lines, or so that any two may coact, as the true lines, indicate.

The plug is turned by a handle, H, attached to the square or angular head *g*, and the travel of a pin, *h*, indicates the closing or opening of the ports, as follows: When the pin is in line with the intermediate port, *b*, and pipe B, all the ports are closed. When the plug is turned so as to bring the pin against the shoulder *s*, the boiler or feed port *a* and the intermediate or cylinder port, *b*, are opened and in connection with each other for the purpose of carrying steam (or other motive agent) to the brake mechanism. Again, if it be desired to relieve the pressure on the brakes to release them, the plug is turned back until the pin reaches the shoulder *t*, when the feed-port *a* is closed, and the cylinder-port *b* brought in circuit with the steam escape or discharge port *c*, and the pressure on the brakes is relieved.

In order to permit of the plug's turning at all times while being maintained in proper position by the nut *k*, I provide a locking-washer, *m*, which turns with the plug and its nut.

In the inner surface of the shell there is a channel, *n*, communicating with an outside orifice, *o*, through which oil is passed for lubricating the wearing-surface of the plug, so that when there is a high degree of pressure the joints at the port-gates will not cut said wearing-surface, as formerly in like three-way cocks where there has been no proper lubrication. This channel runs lengthwise the shell, and the oil-orifice communicates directly with it, being opposite the intermediate port, and always capable of directing the oil against the wearing-surface of the plug.

The lever or handle is under the control of the engineer or operator, whereby, on observing the shoulders or points of arrest of the pin, any port may be put in connection with the other, or all may be closed. Either one of the opposite ports may be the source of supply or of discharge, the intermediate port connecting with the cylinder for feed or exhaust.

Air, gas, gaseous vapors, steam, or water may be controlled or guided in its flow-actions by this three-way cock.

I claim—

5 1. In a three-way cock having two opposite ports and one intermediate port, the pin *h* upon the cock or plug *G*, in combination with the shoulders *s t* upon the shell *A*, and the said ports *a b c*, substantially as and for the
10 purpose set forth.

2. In a three-way cock having two opposite ports and an intermediate port, the shell *A*, provided with a channel or gutter, *n*, running
15 lengthwise thereof and communicating directly with an oiling-orifice, *o*, in said shell opposite the intermediate port, *b*, in combina-

tion with the excavated plug *G*, for the purpose of lubricating the wearing-surface of said excavated plug, substantially as described.

3. A three-way cock in which the plug has 20 an excavation, *f*, equal to the passage of the ports, and having a pin, *h*, and shoulders *s t*, to exhibit the closing of all the ports, or the circuit connection of two ports, substantially
as set forth. 25

In testimony whereof I have hereunto set my hand.

W. H. WARD.

Witnesses:

A. E. H. JOHNSON,

J. W. HAMILTON JOHNSON.