

No. 794,014.

PATENTED JULY 4, 1905.

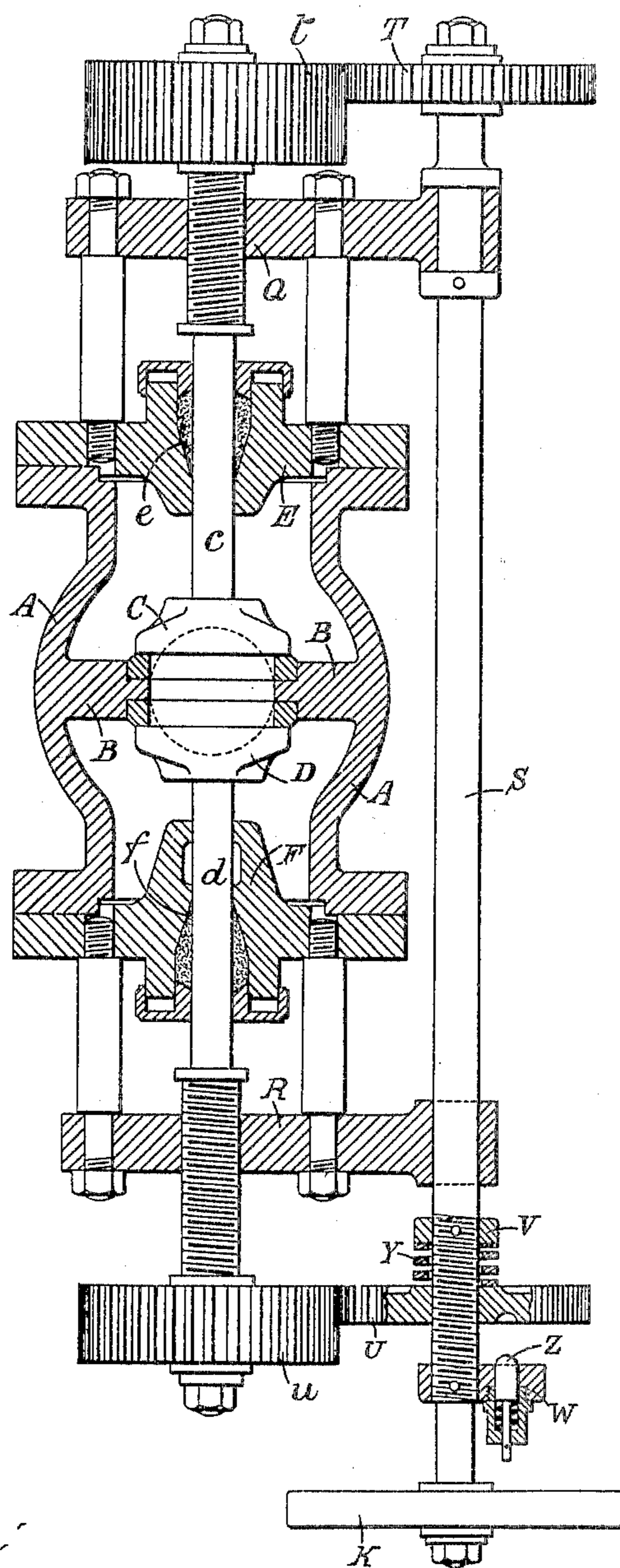
J. HOPKINSON & R. KILBURN.

STOP VALVE.

APPLICATION FILED DEC. 27, 1904.

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses:

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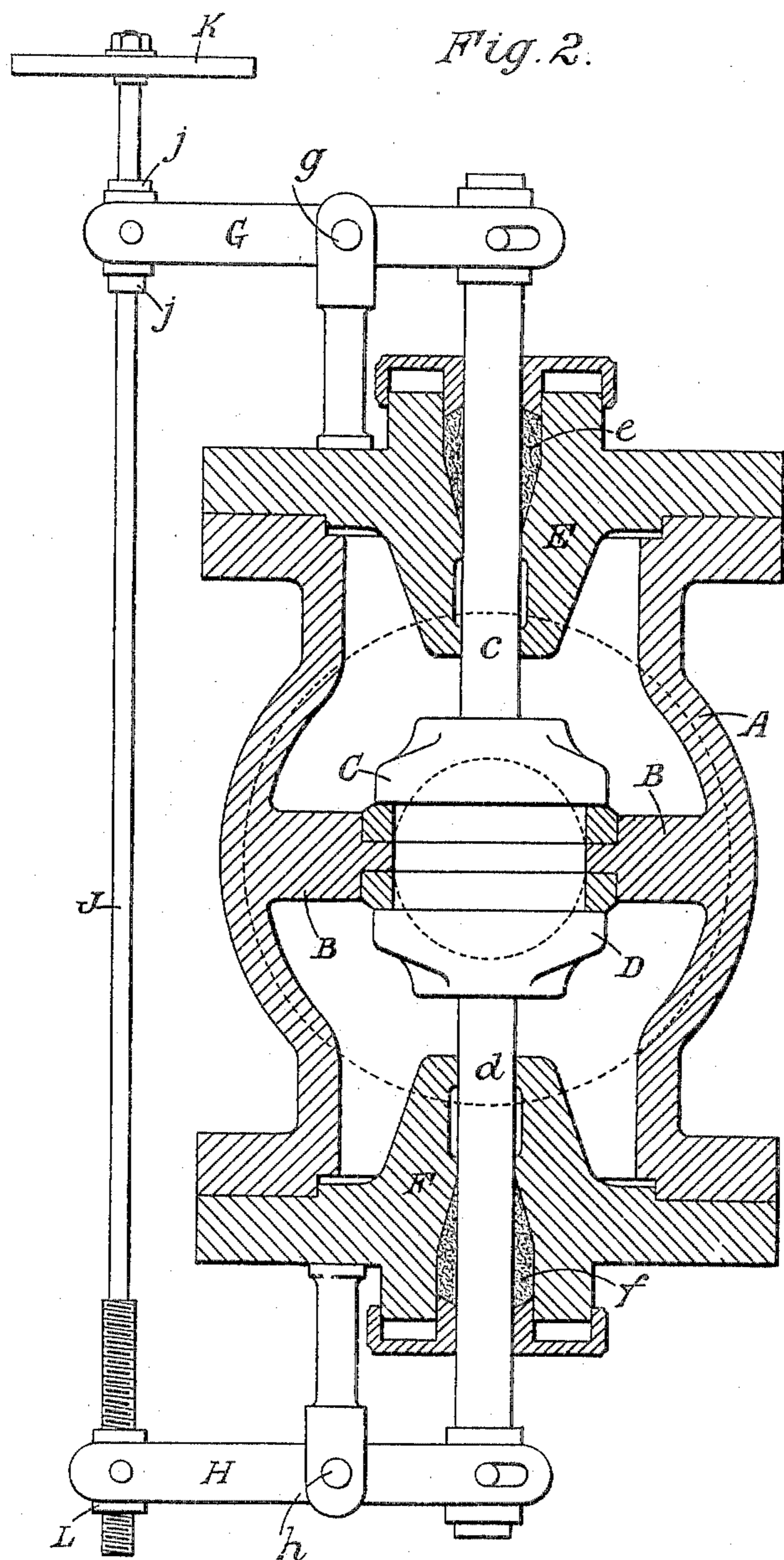
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3 SHEETS—SHEET 2.



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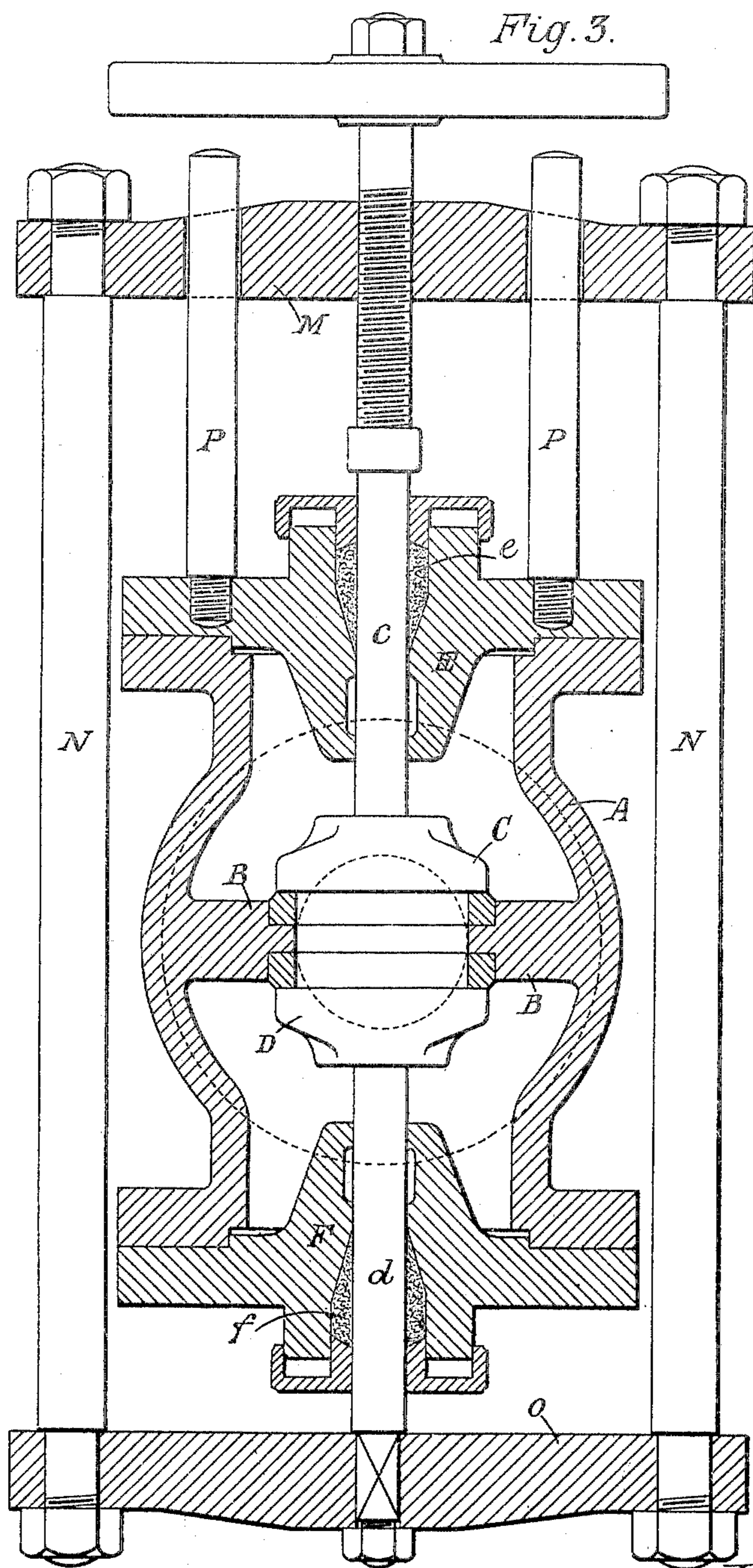
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

JOSEPH HOPKINSON AND RICHARD KILBURN, OF HUDDERSFIELD, ENGLAND, ASSIGNORS TO J. HOPKINSON AND COMPANY, LIMITED, OF HUDDERSFIELD, ENGLAND, A CORPORATION OF GREAT BRITAIN.

STOP-VALVE.

SPECIFICATION forming part of Letters Patent No. 794,014, dated July 4, 1905.

Application filed December 27, 1904. Serial No. 238,456.

To all whom it may concern:

Be it known that we, JOSEPH HOPKINSON and RICHARD KILBURN, subjects of the King of Great Britain, residing at Huddersfield, England, have invented certain new and useful Improvements in Stop-Valves, of which the following is a specification.

In the specification of application Serial No. 218,141 we describe an invention applicable to screw-down stop-valves of the mushroom type for steam and other fluids wherein two valves are used working in opposite directions and arranged on opposite sides of a seating floor or partition. Said valves are connected together through their actuating mechanism and are arranged to close onto the seating-floor from opposite sides thereof and to nip said floor when closed without straining the valve-casing or bringing one-sided pressure to bear on the seating-floor by the closing means. In carrying out that invention we employed for one of the valves a tubular spindle connected to a bridge having a limited movement on fixed guides, the spindle of the other valve being arranged to pass through the aforesaid tubular spindle and being connected to the bridge by a screw-threaded sleeve. In this construction, therefore, the connections are concentric.

Now according to the present invention we employ the same arrangement of valves for nipping the seating-floor, but we dispense with the concentric arrangement of spindles, and in lieu thereof we pass the valve-spindles out in opposite directions through lids on opposite sides of the casing, so that no spindle passes through the thoroughfare in the partition, as heretofore, and we actuate the spindles by connected gearing or by connected levers or rods and screw mechanism.

In the accompanying drawings we have illustrated our improved valve in central transverse section and different modes of actuating the valve-spindles, Figure 1 showing gearing for connecting and actuating the valve-spindles; Fig. 2, levers, and Fig. 3 rods or links.

A is the valve-casing, B the partition, hav-

ing a seat-face on both sides thereof, and C D the two valves for closing the thoroughfare through the partition. These valves are inserted from opposite sides of the valve-casing through openings which are closed by lids E F, so that the spindle of the lower valve does not pass through and partially obstruct the thoroughfare, as it does in the arrangement described in the specification above referred to. The spindle *c* of the valve C passes through a stuffing-box *e* in the lid E, and the spindle *d* of the valve D passes through a stuffing-box *f* in the lid F. Both these stuffing-boxes are accessible from the exterior and can be readily packed and adjusted when required.

In the arrangement shown in Fig. 1 the spindle *c* screws through a cross-bar Q, carried by the lid E, and the spindle *d* screws through a cross-bar R, carried by the lid F. These cross-bars also form bearings for the actuating-spindle S, which is geared to the spindle *c* by gear-wheels T *t* and to the spindle *d* by gear-wheels U *u*. The wheels T *t* *u* are fixed to their respective spindles; but the wheel U has its bore screw-threaded and engages with a screw-threaded part of the spindle S. V W are collars fixed on the spindle S on opposite sides of the wheel U, and Y is a spring arranged between the collar V and the wheel U for a purpose hereinafter explained.

To open the valve, the hand-wheel K is rotated counter-clockwise, when the upper or main valve C will be lifted from its seat by the action of the upper pair of gear-wheels; but the lower valve will be kept to its seat by the steam-pressure under it, and the wheel U will travel down the spindle S until it comes against and is locked by the fixed collar W, whereupon further rotation of the hand-wheel in the same direction will open the valve D. To close the valve, the hand-wheel K is rotated clockwise, when both valves C and D will begin to close simultaneously; but the valve D will reach its seat while the valve C is still open equal to the full area. Further rotation of the hand-wheel in the same direc-

tion will cause a spring-plunger Z to release the wheel U, and the latter will then travel up the spindle S while the valve C is completing its closing movement. When the valve C reaches its seat, the wheel U at the same time engages with the spring Y, and any further movement of the hand-wheel will press the valves tightly on their seats.

In the arrangement shown in Fig. 2 the spindles *c d* are suitably connected, respectively, to the inner ends of levers G H, which are fulcrumed, respectively, at *g h*, and the outer ends of said levers are connected together by a screw-threaded link or rod J, furnished with a hand-wheel K for rotating it. As shown, the lever H carries a pivoted nut L, through which the screw-threads of the rod J are screwed, and the lever G is constructed to be engaged by collars *j j* on the rod J, so that the said rod can rotate without moving the lever G, but cannot move longitudinally without carrying the lever G with it. On turning the rod J in the proper direction the valve C on the outlet side of the partition will be opened first, the other valve remaining closed; but when the valve C is fully opened and comes against the lid, which forms a stop therefor, then the continued rotation of the rod J in the same direction will cause the valve D to open in the opposite direction to the valve C. Similarly the rotation of the rod J in the other direction will first close the valve D and then the valve C. Instead of utilizing the lid as a stop for the valve C an external stop can be provided.

In the arrangement shown in Fig. 3 the spindle of the valve C is screw-threaded and screws through a cross-bar M, which is connected by links N N to a second cross-bar O, fixed on the spindle of the valve D. P P are guide-rods to prevent rotation of the cross-bar M. On turning the spindle *c* the valve C is raised until it comes against the lid, and then continued rotation of the spindle *c* in the same direction causes the cross-bar M to move downward, and so open the valve D.

The reverse action takes place when closing the valve.

In all the above-described arrangements of valve both valves control the thoroughfare through the seating-floor, and if either valve is tight notwithstanding that the other may leak no steam or fluid can pass through the thoroughfare.

What we claim is—

1. In a stop-valve, the combination, with a valve-casing, of a partition having a thoroughfare therethrough, a seat-face on each side of said partition, a pair of valves for engaging with the said seat-faces, the spindles of said valves passing out of the valve-casing on opposite sides thereof, and means for connecting and actuating said valve-spindles.

2. In a stop-valve, the combination, with a valve-casing, of a partition having a thoroughfare therethrough, a seat-face on each side of said partition, a pair of valves for engaging with the said seat-faces, the spindles of said valves passing out of the valve-casing on opposite sides thereof, a cross-bar M screw-threaded on one of the valve-spindles, a cross-bar O fixed to the other valve-spindle, and links N, N uniting said cross-bars M, O.

3. In a stop-valve, the combination, with a valve-casing, of a partition having a thoroughfare therethrough, a seat-face on each side of said partition, a pair of valves for engaging with the said seat-faces, the spindles of said valves passing out of the valve-casing on opposite sides thereof, a cross-bar M screw-threaded on one of the valve-spindles, a cross-bar O fixed to the other valve-spindle, links N, N uniting said cross-bars M, O, and guides P, P for the cross-bar M.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

JOSEPH HOPKINSON.
RICHARD KILBURN.

Witnesses:

JOHN R. SUALAM,
THOMAS H. HIRST.