

No. 610,412.

Patented Sept. 6, 1898.

J. POWELL.  
STRAIGHTWAY VALVE.

(Application filed Oct. 25, 1897.)

(No Model.)

FIG. 1.

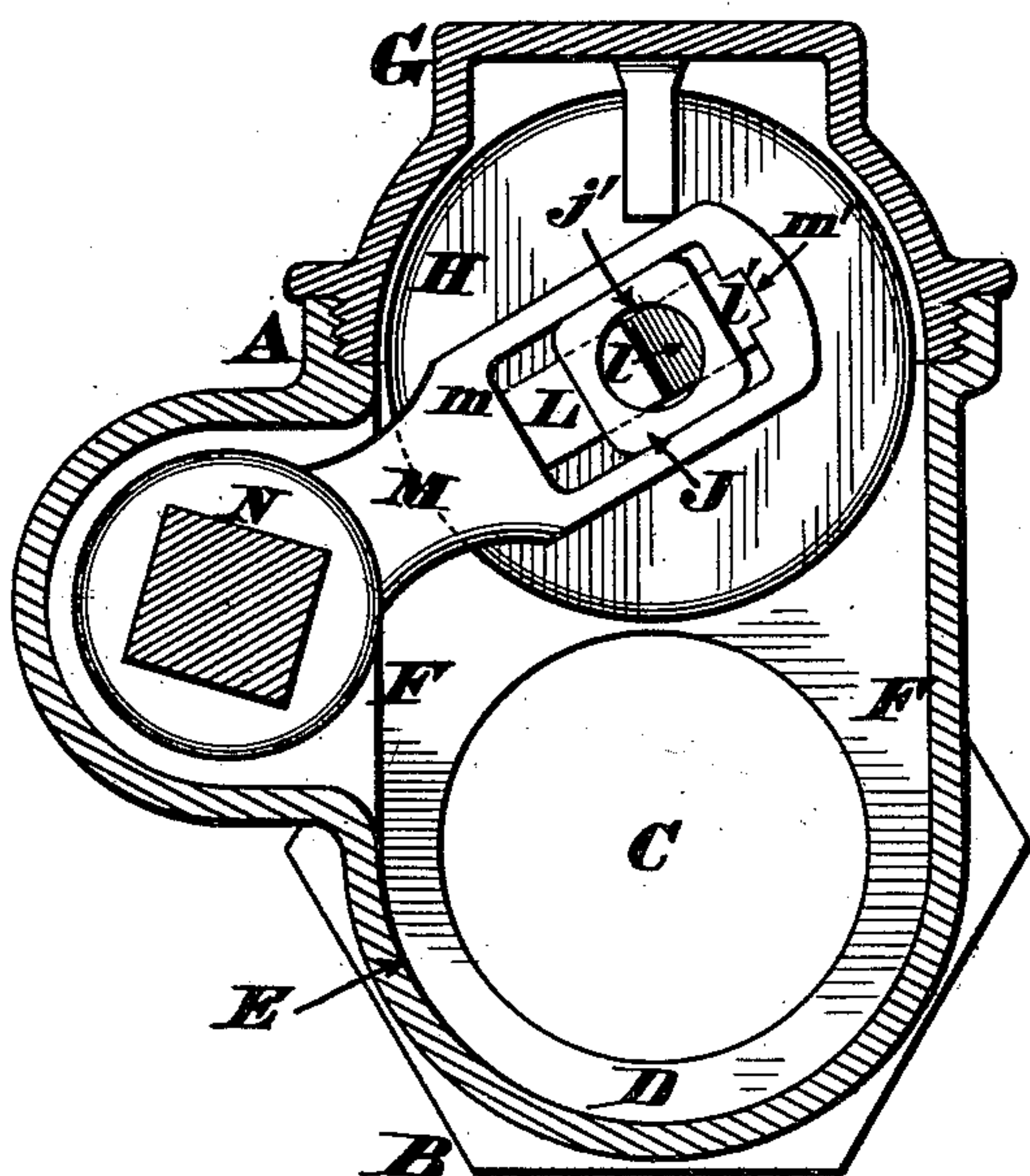


FIG. 2.

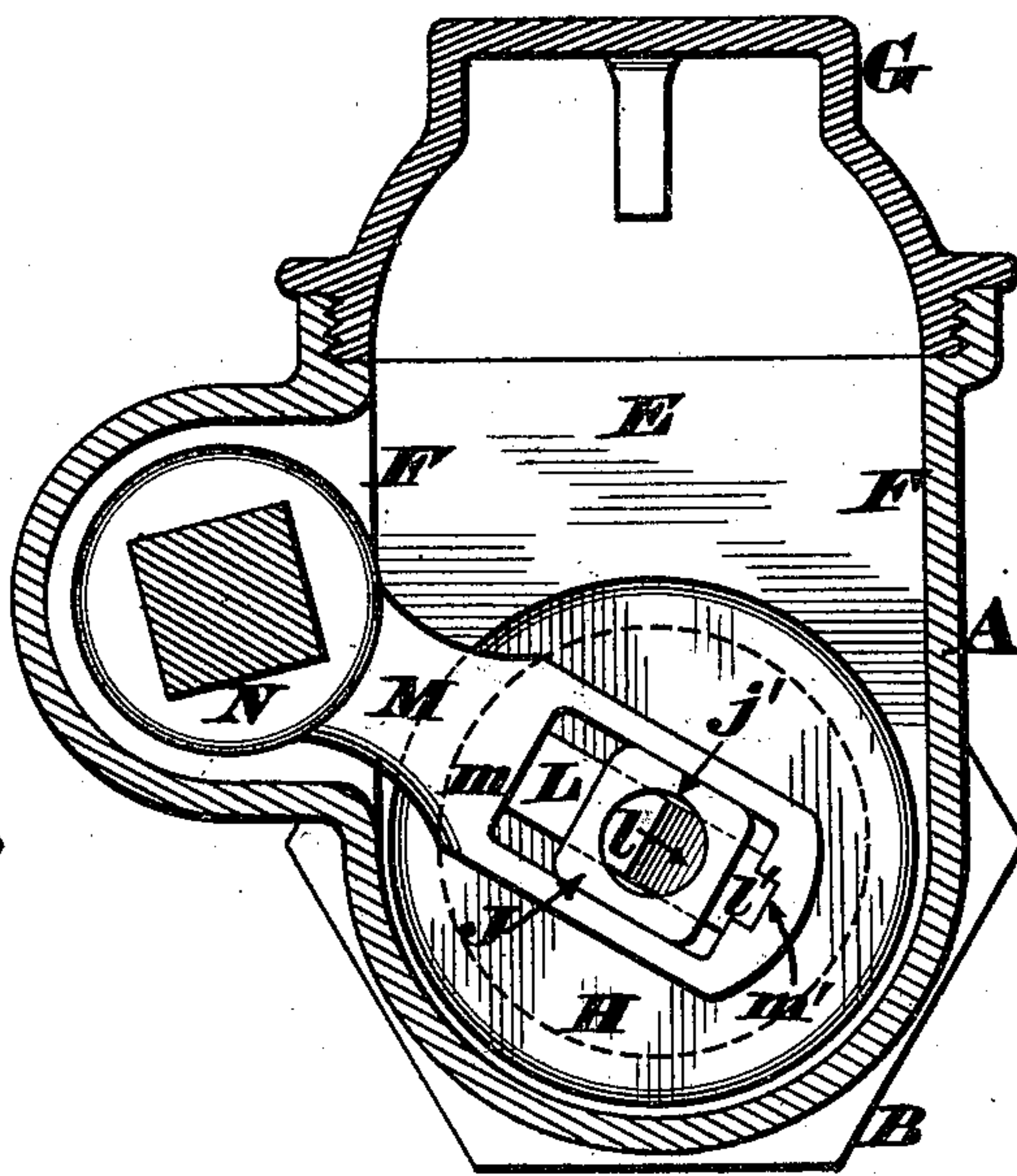


FIG. 3.

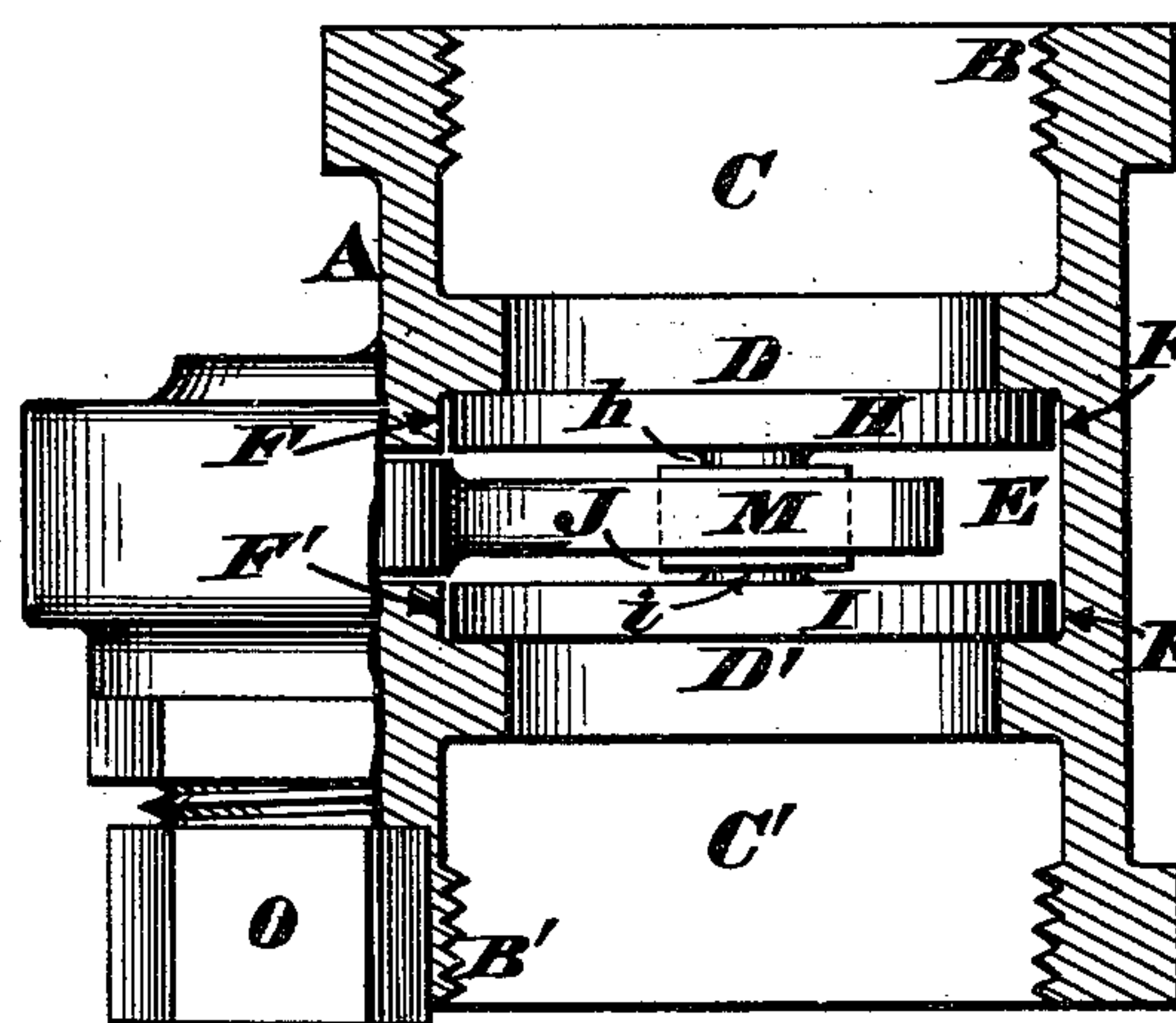


FIG. 4.

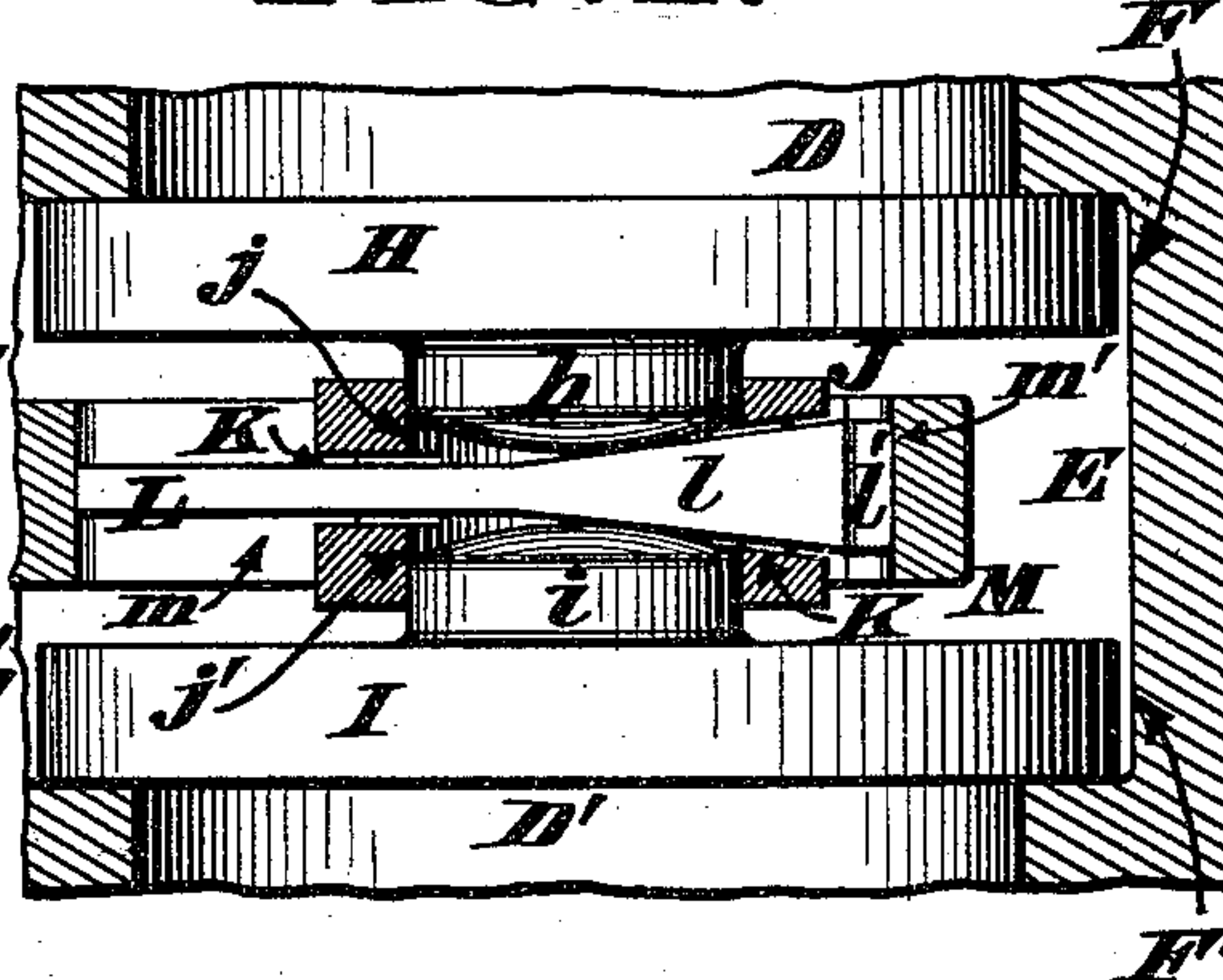
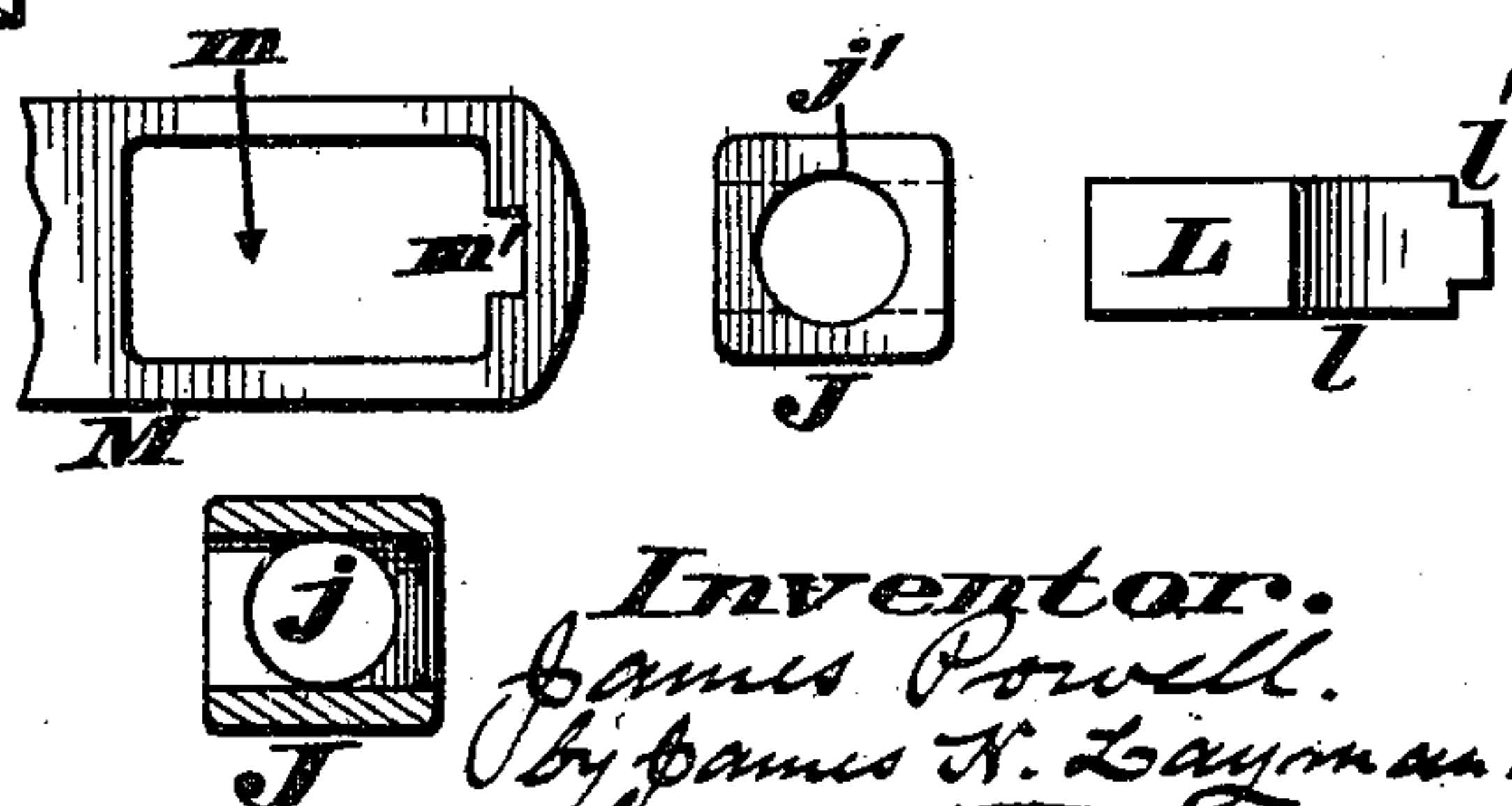


FIG. 5.



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# UNITED STATES PATENT OFFICE.

JAMES POWELL, OF CINCINNATI, OHIO, ASSIGNOR TO THE WILLIAM POWELL COMPANY, OF SAME PLACE.

## STRAIGHTWAY VALVE.

SPECIFICATION forming part of Letters Patent No. 610,412, dated September 6, 1898.

Application filed October 25, 1897. Serial No. 656,321. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES POWELL, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Straightway Valves; and I do hereby declare the following to be a full, clear, and exact description of the invention, reference being had to the annexed drawings, which form a part of this specification.

The object of this invention is to improve the construction of the peculiar form of straightway valve seen in Letters Patent No. 533,991, granted to James H. Layman February 12, 1895. In said patent two disk valves are shown having studs or pivots journaled in a longitudinally-slotted carrier traversing the free end of a vibrating lever, which lever terminates with an integral wedge that bears against the ends of said pivots and forces said valves outwardly in the act of opening and closing them; but experience has proven this construction to be deficient in strength on account of the cutting away of the metal near the free end of the lever to form the wedge. I accordingly make this portion of the vibrating lever to inclose the sliding carrier, so as to give greater strength to this part. Furthermore, the wedging device may be integral with the lever or be made separate and inserted within a longitudinal slot of said lever, which slot is traversed by a valve-carrier, and this mode of construction I much prefer. If the wedging or expanding device is made integral with the lever in my improved construction, the box-carrier in that case is preferably divided longitudinally through its center, each half, with its respective circular journal-bearing, being adapted to slide independently of the other half within the slotted sides of the vibrating lever. By this arrangement the friction of the working parts of the valve is greatly diminished, and in case either section of the box-carrier should break or wear down by constant use a new one can be readily fitted to the lever, as hereinafter more fully described.

In the annexed drawings, Figure 1 is a vertical section of my improved straightway valve, taken in the plane of its vibrating lever, which lever is swung up so as to elevate

the disks and thereby open the channels or fluid-passages of the shell. Fig. 2 is a similar section of the valve, but showing the disks lowered and said passages closed. Fig. 3 is a sectional plan of this closed valve. Fig. 4 is a greatly-enlarged horizontal section through the devices that force the closed valves against their respective seats, the "expander" of said devices being shown in plan. Fig. 5 is a side elevation showing said expander, a slide, and a portion of the vibrating lever separated from each other. Fig. 6 is a vertical section of an elaboration of my invention.

A represents a shell or casing for an ordinary straightway valve, and B B' are the pipe ends or couplings thereof, said ends being traversed by customary channels or fluid-passages C C', at the inner ends of which latter are seats D D', whose ports open into the lower portion of a chamber E, having duplicate guides F F' at its opposite sides and closed at top by a cap G, which may be either screwed or bolted upon said shell. Adapted to be forced against the aforesaid seats are disk valves H I, from whose inner or opposing sides project short lateral studs or pivots *h i*, the ends of the latter being either conical or slightly rounded, as seen in Fig. 4. J in this illustration represents a slide or box having on its opposite sides circular holes *j j'* of the proper diameter to readily admit the pivots *h i*. Furthermore, this slide is slotted longitudinally at K to receive a metallic plate L, having a wedge-shaped portion *l* and at one side of said wedge a tongue *l'*, which device L *l l'* will be hereinafter alluded to as the "expander." The tongue *l'* is adapted to enter a groove *m'* at the end of a longitudinal slot *m* of the vibrating lever M. By this simple expedient the expander can be inserted in the slot only in such a way as to locate the wedge *l* near the free end of the lever M, which latter is operated by a rock-shaft N, journaled in a stuffing-box O and having an external handle P.

From the above description it will be readily understood that when the lever M is swung up to the position seen in Fig. 1 the opposite sides of the wedge *l* act against the beveled ends of pivots *h i* and thereby force the valve-



disks H I away from each other and cause them to bear quite firmly against the sides or walls of the chamber E. Consequently the valves are now locked quite firmly in their open position and are not liable to be shaken loose by ordinary vibrations of machinery, &c. To close them, sufficient force must be exerted against the handle P to overcome this wedging action and enable the lever M to be swung down to the position seen in Figs. 2 and 3. As soon as the lever begins this swinging motion the pressure is gradually removed from the disks, because the wedge *l* is now receding from the pivots *h i*, and by the time said lever is horizontally in line with the axis of rock-shaft N said pivots are in contact with the parallel sides of the expander L. Therefore at this time the disks are free from all pressure; but as the lever swings down farther and farther the wedge again comes gradually into action, and when said lever has reached the position seen in Fig. 2 said disks are again forced away from each other and caused to bear very firmly against their respective seats D D'. Consequently the valves are now locked securely in their closed position and can be opened only by exerting sufficient force against the handle P to throw the lever M up to the angle seen in Fig. 1. As the lever is thus swung up and down the slide or box J travels back and forth within the longitudinal slot *m* and causes the ends of the pivots *h i* to bear against the sides of the wedge, and when said pivots become worn sufficiently to prevent a proper closing of the disks a new and somewhat thicker expander can be readily inserted within the slotted lever. This is a great advantage possessed by my valve over those wherein the wedge is integral with the lever, as this latter construction has

no means whatever for taking up any wear and tear of the operative parts.

In the elaboration of my invention seen in Fig. 6 the pivots *h i* have sockets or counter-bores in their ends to admit steel balls *h' i'*, that bear against the expander L, and thereby diminish the friction incidental to opening and closing the valves.

I claim as my invention—

1. The combination, in a straightway valve, of a shell having a pair of channels, a chamber provided with a guide and a valve-seat, a longitudinally-slotted lever whose free end vibrates within said chamber, a slotted slide traversing the lever-slot and having a circular side opening; a detachable expander fitted within said slide and lever, and a valve having a pivot inserted in said side opening, and adapted to be forced outwardly by said expander, in the manner described, and for the purpose stated.

2. The combination, in a straightway valve, of a shell having a pair of channels C, C', a chamber E, provided with a pair of duplicate guides F, F', F', F', and valve-seats D, D', a vibrating lever M, slotted longitudinally at *m*, and having a groove *m'*, at one end of said slot; a slide J traversing said slot *m*, and provided with side openings *j, j'*, and a longitudinal slot K; a detachable expander L, *l, l'*, fitted within said slide and lever, and a pair of valves H, I, having pivots *h, i*, inserted within said openings *j, j'*, and bearing against said expander, for the purpose stated.

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

JAMES POWELL.

Witnesses:

JAMES H. LAYMAN,  
JESSE M. SIMON.