

(No Model.)

2 Sheets—Sheet 1.

W. G. ABEL.  
GATE VALVE.

No. 287,788.

Patented Nov. 6, 1883.

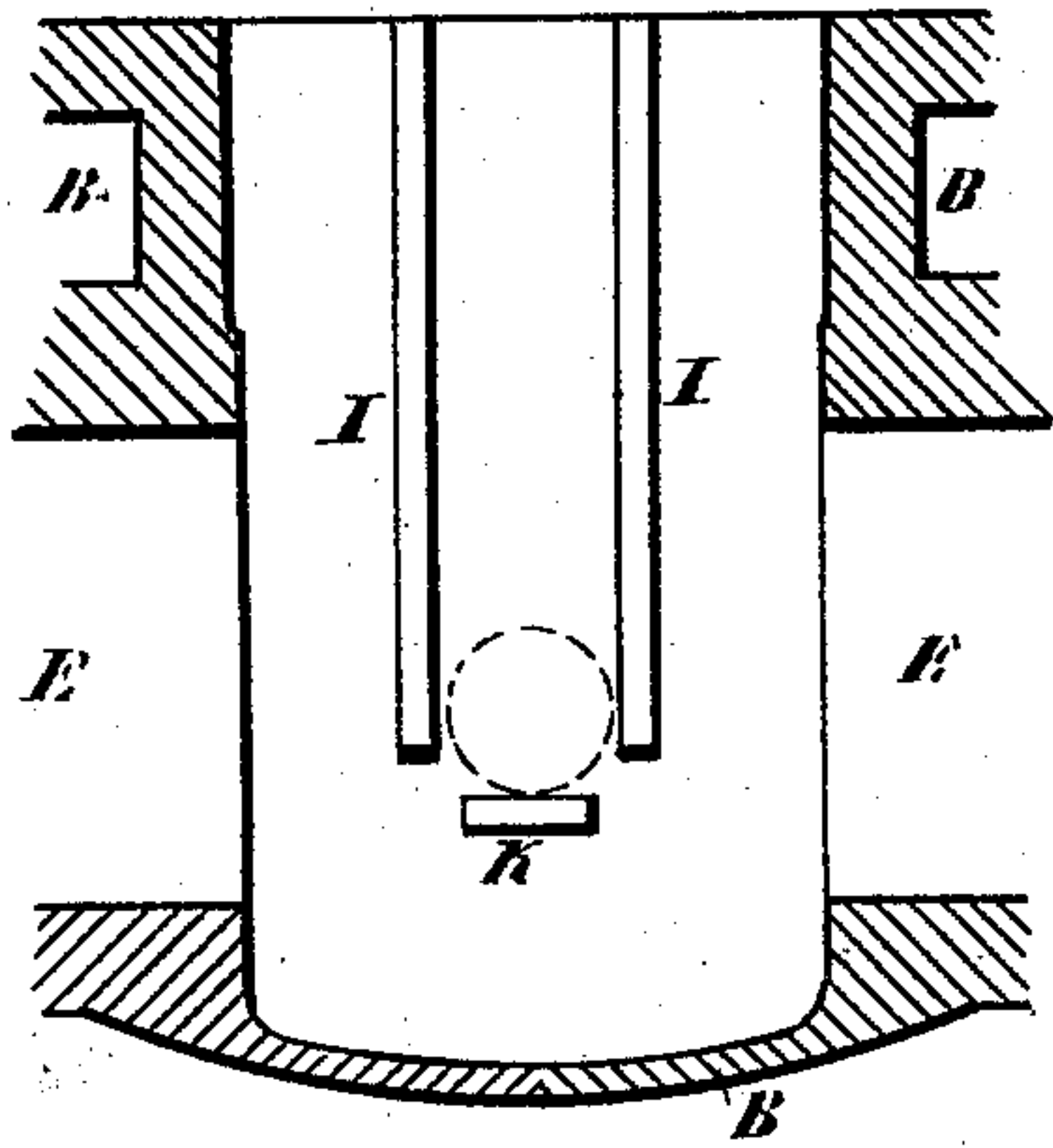


Fig. 4.

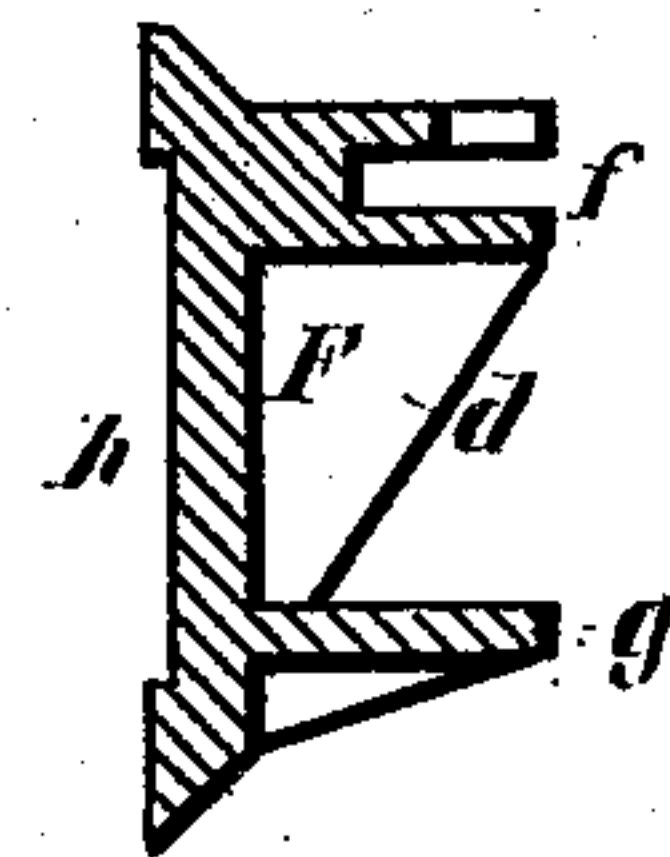
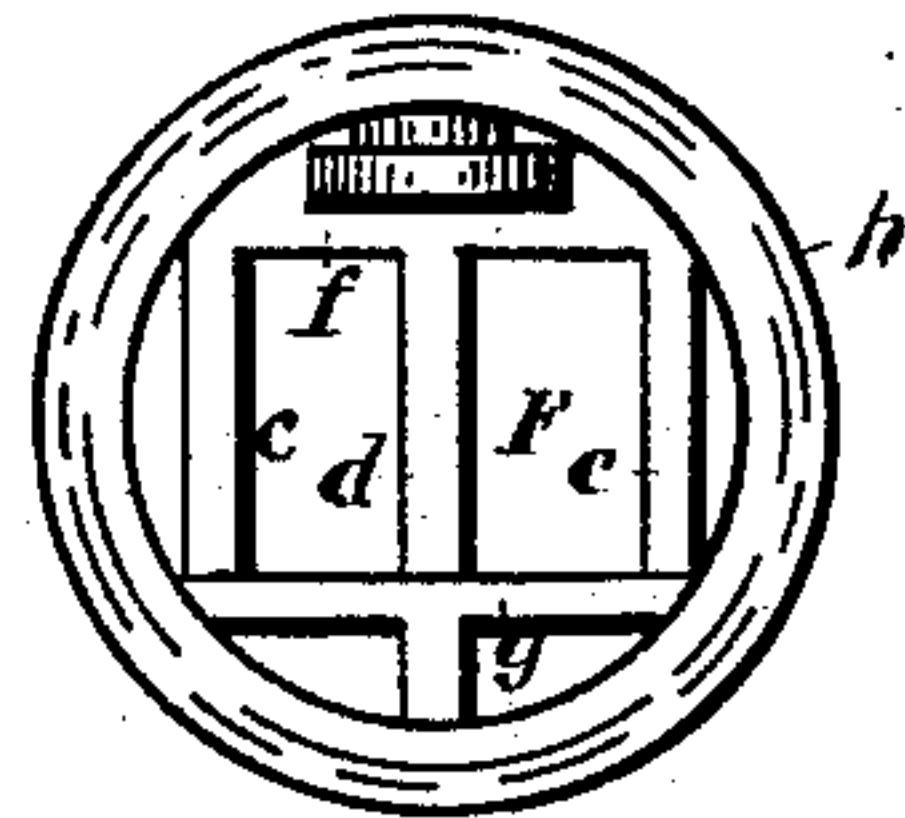


Fig. 3.

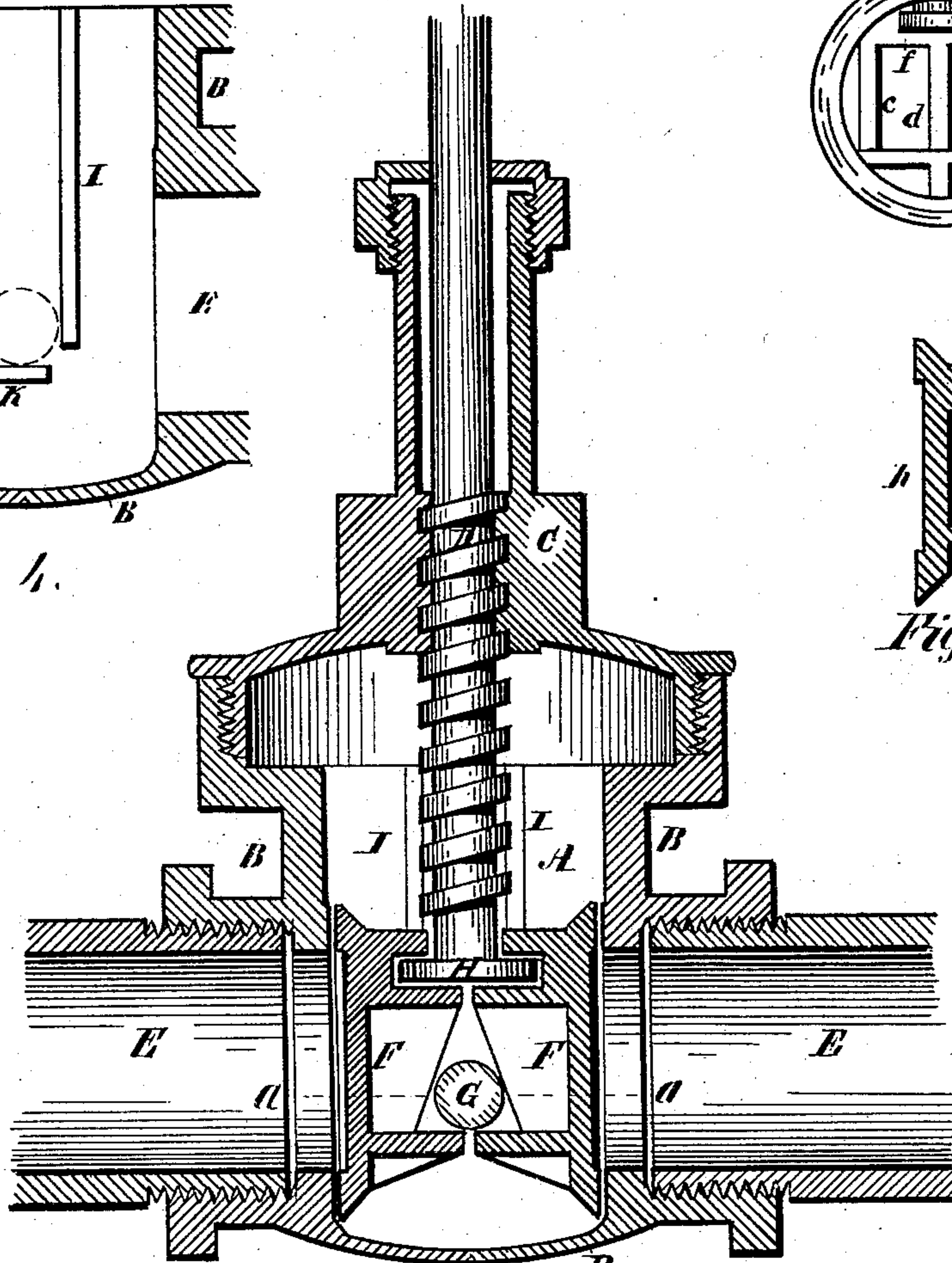


Fig. 1.

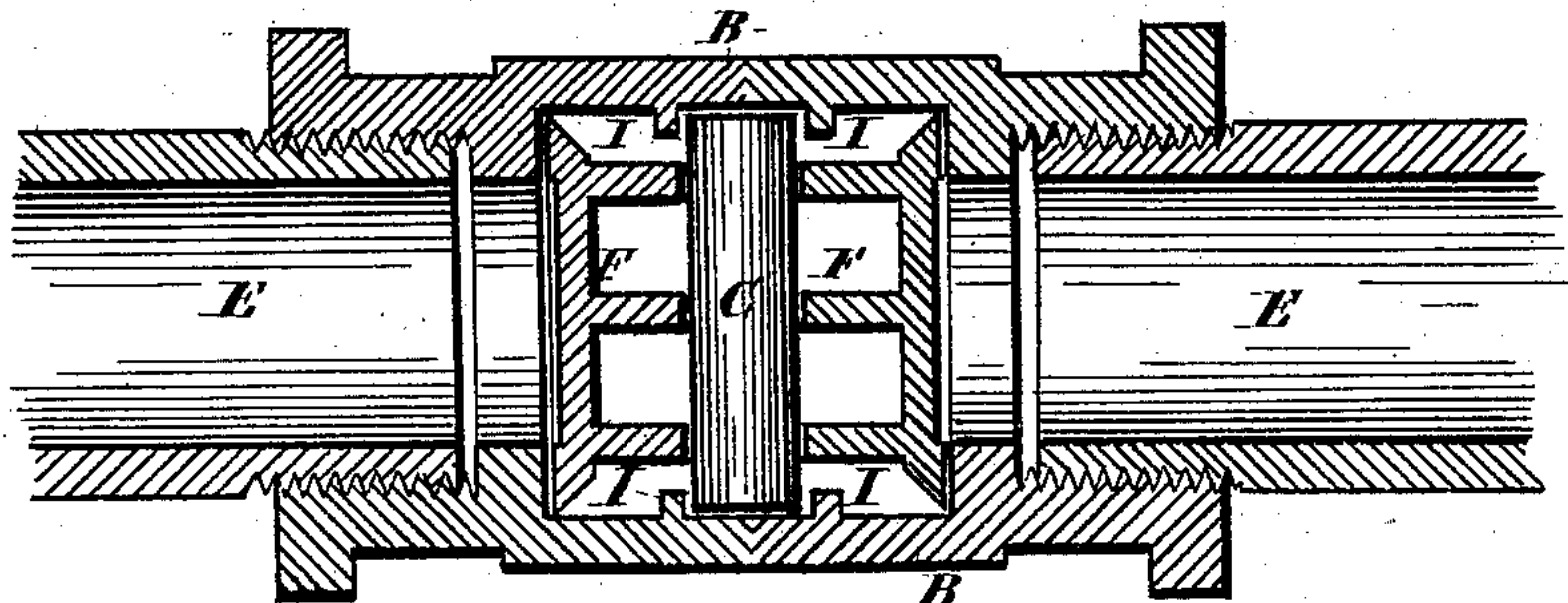


Fig. 2.

Alfred King,  
A. B. Howland, } Witnesses.

William G. Abel  
By Joseph Smith } Inventor.  
attorney.

(No Model.)

2 Sheets—Sheet 2.

W. G. ABEL.

GATE VALVE.

No. 287,788.

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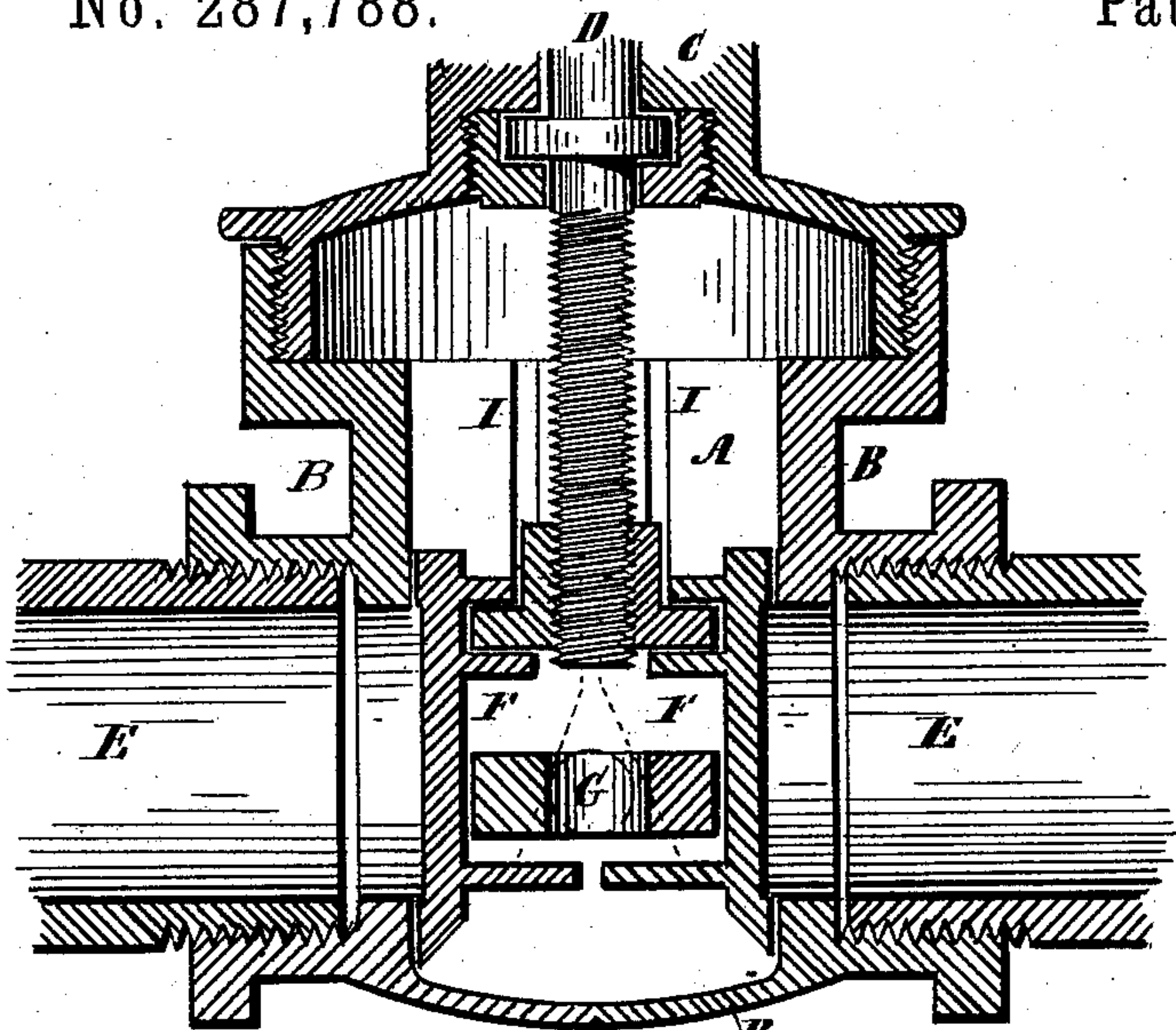


Fig. 5.

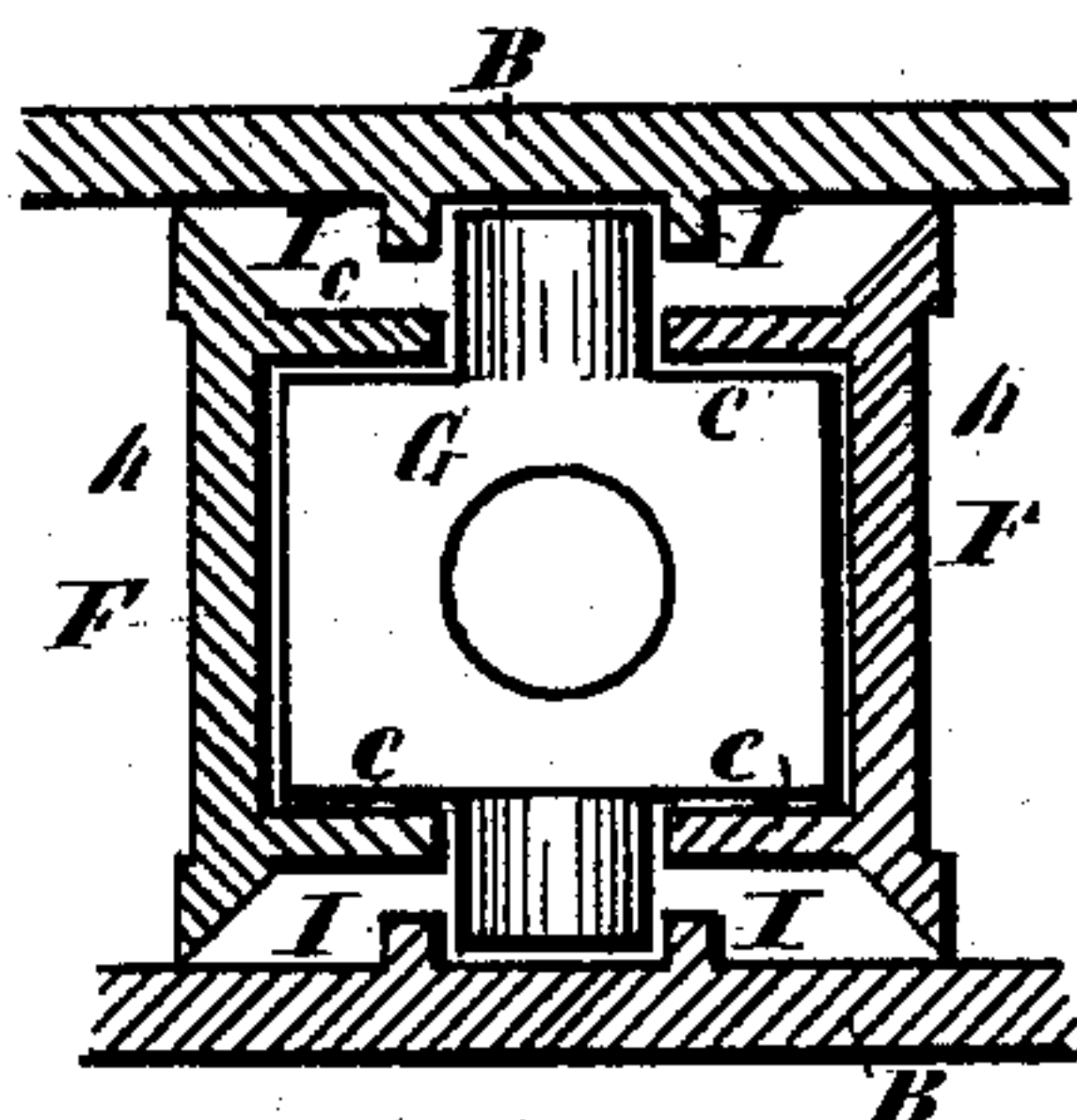


Fig. 6.

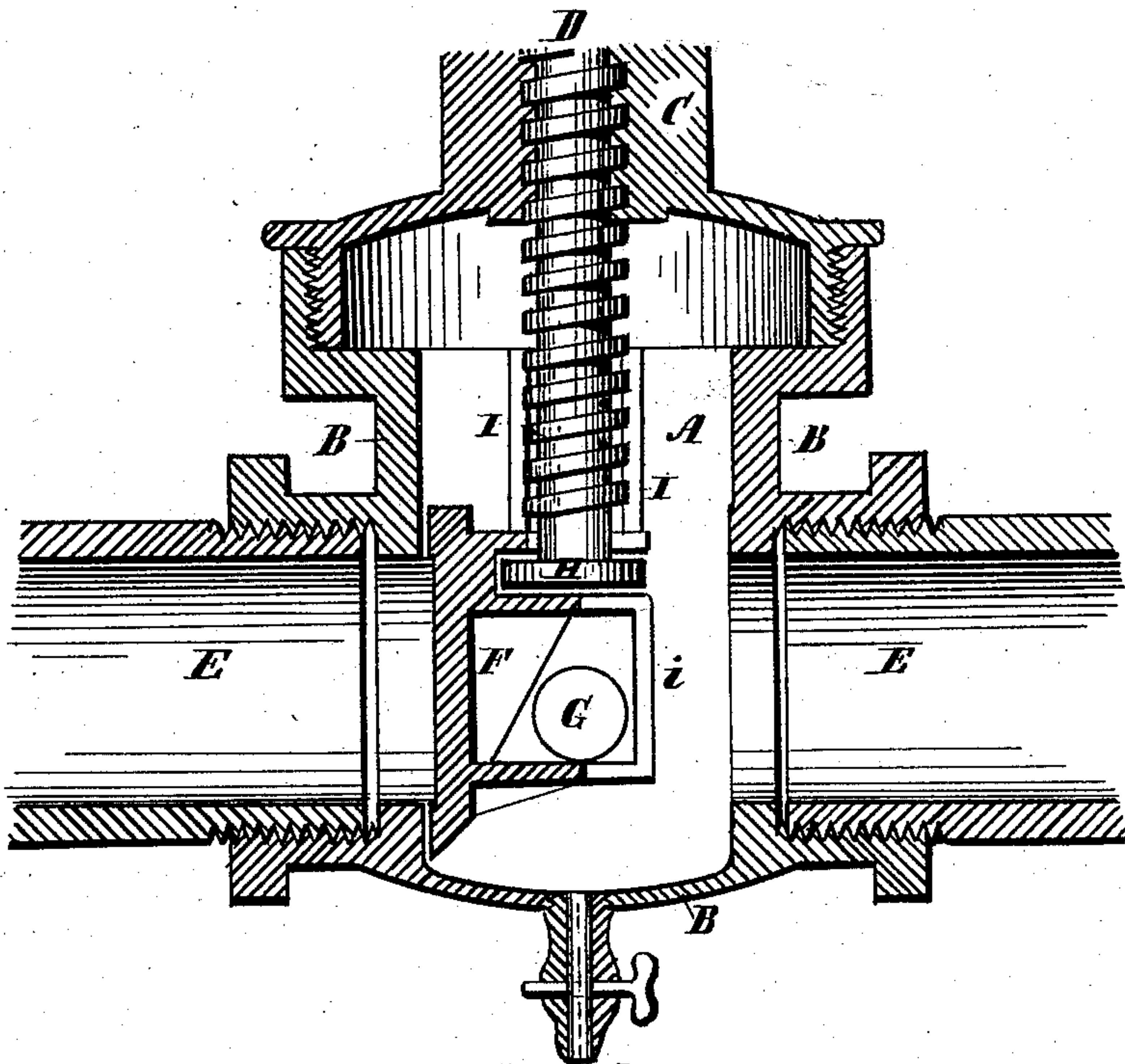


Fig. 7.

Alfred King  
A. B. Howland.

Witnesses.

William G. Abel  
Joseph Smith  
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Inventor.



# UNITED STATES PATENT OFFICE.

WILLIAM G. ABEL, OF TITUSVILLE, PENNSYLVANIA, ASSIGNOR OF ONE-THIRD TO ALFRED KING, OF SAME PLACE.

## GATE-VALVE.

SPECIFICATION forming part of Letters Patent No. 287,788, dated November 6, 1883.

Application filed February 27, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM G. ABEL, a citizen of the United States, residing at Titusville, in the county of Crawford and State of Pennsylvania, have invented a new and useful Improvement in Gate-Valves, of which the following is a specification.

My invention relates to that class of gate-valves used in lines of pipe for conveying steam, water, oil, or other fluids, my object being to produce a valve that in its movements in opening and closing shall be free from friction, and by its form keep the valve-chamber free from any deposit of sediment to obstruct its working, and that in closing the valve shall be expanded by simple action against the disks, pressing them against the valve-seats without in any way or in any part straining the walls of the valve-chamber. I attain this by the construction illustrated in the accompanying two sheets of drawings, in which—

Figure 1 is a vertical section of the valve, valve-stem, valve-chamber, and parts adjacent thereto, and illustrates the working of my valve where the valve-stem moves up and down in opening and closing, carrying the valve with it. Fig. 2 is a cross-section of Fig. 1 on line *a a*; Fig. 3, a view of one disk on the back or inner side, and a vertical section of the same through the center; Fig. 4, an interior view of one side of the valve-chamber, showing the guides in which the spreading-bar works; Fig. 5, Sheet 2, a vertical section of the valve and valve-chamber where the valve-stem merely revolves in the neck and the valve moves up and down on the valve-stem; Fig. 6, a view of the spreading-bar as used in Fig. 5, and Fig. 7 a vertical section of valve and valve-chamber where but one disk is used.

Similar letters in the several drawings indicate similar parts.

A is the valve-chamber; B, walls of same; C, neck of valve-chamber; D, valve-stem; E, inlet and discharge pipes; F, disks of valve; G, spreading-bar; H, button on lower end of valve-stem engaging with the disks F; I, guides to spreading-bar; K, stops to spreading-bar.

The valve-chamber, (except as hereinafter

mentioned,) neck, and valve-stem are constructed in the usual manner. The disks F, as shown in Figs. 1, 2, and 3, are constructed with solid faces, but on the back or inner sides are ribbed, as shown in Fig. 3, the transverse ribs *f* and *g* projecting, so that when the two disks are in place in the valve-chamber the ribs very nearly meet. In the upper rib, *f*, is a recess or slot which engages with the button H on the valve-stem. Between the transverse ribs *f* and *g* are the vertical ribs or braces *c*, *d*, and *e*, (more or less in number, as required,) made wedge shape, wider at top, so that when the two disks are placed together, as in use, an aperture is left in the shape of an isosceles triangle, the apex at the top, in which aperture, and transversely of the valve, is inserted the round spreading-bar G, of a diameter as great as can be inserted, and length very nearly equal to the width of the valve-chamber A. On the walls of the valve-chamber, on each side, are placed the guides I, Fig. 4. When the valve, composed of the two disks and the spreading-bar, is suspended from the valve-stem D and inserted in the chamber, the two ends of the spreading-bar G, as suspended by the two transverse ribs *g*, move up and down between the guides I on each side of the chamber. At such a point near the lower end of the guides I as that the spreading-bar shall rest upon it when the disks F are very nearly opposite the valve-seats, is placed the stop K.

The faces of the disks F are made on the lower side (and preferably all around) with a sharp or chisel edge, as shown in the drawings.

The operation is as follows: The valve being open, or partially so, the valve is held suspended upon the valve-stem, with the ends of the spreading-bar between the guides I. As the valve is being closed the sharp edges of the disks cut away and remove from the valve-seats any sediment, paraffine, or other matter that may have gathered there, pressing it toward the center of the valve-chamber, the bar G following down between the guides. As the disks come opposite the valve-seats the ends of the bar G rest on the stops K, and the farther progress of the bar is arrested.



The pressure of the valve-stem upon the disks being continued, the disks are, by the action of the spreading-bar upon their backs, forced apart and firmly held against the valve-seats.

5 All this is done without the disks or any part of the valve touching the bottom of the valve-chamber. The bottom of the chamber, therefore, is entirely clear from any obstruction, and, being made slightly depressed, any sediment remaining or removed from the face of the valve-seat in closing is, by the action of the disks in closing, removed into the center of the chamber. When the valve is being opened, the first direction of the current is directed toward the bottom of the chamber, and the collection of sediment is washed away. There is left a small opening between the bottom of the guides I and the stop K, in order that the current may flow freely through over the top of the stop K and prevent any accumulation of dirt to obstruct the working of the bar G.

In valves where there is no motion of the valve-stem up and down—merely rotary—I make use of the device illustrated in Fig. 5, Sheet 2, of a nut on the lower end of the valve-stem engaging with the disks F and performing the same functions as the button H, above described. In this case, however, the middle vertical rib, *d*, Fig. 3, is omitted, and the spreading-bar G is constructed, as shown in Fig. 6, as entirely filling the space between the solid parts of the two disks, and with a hole through the center, through which the valve-stem passes as the valve is being raised, the round part of the spreading-bar operating on the side ribs, *c* and *e*, in the same manner as heretofore described.

If it is desired, for any reason, to only close the opening on one side of the valve, I construct the disk in the manner shown in Fig. 7, which is the same as shown in Fig. 3, except the retaining-band *i* is added to the back side. The spreading-bar being held in position laterally by the guides I, its operation upon the

one disk is the same as if the opposite disk were in place, and the opening on one side is closed while the other is entirely free and open. In that way, by a petcock inserted in the bottom of the valve-chamber, the valve and pipe on one side may be drained.

I claim as my invention—

1. In a gate-valve, the combination, with the chamber thereof, provided with vertical guides and the projecting stop, of the two-part valve, consisting of disks having their adjacent walls inclined and forming a triangular opening, and the transverse spreading-bar fitting in said opening and between said guides, and adapted to be supported by the stop and to expand the disks when forced down upon it, substantially as shown and described.

2. In a gate-valve, the combination, with the chamber having its bottom depressed to form a sediment-receptacle, and provided with the vertical guides and projecting stop, of the two-part valve, consisting of disks having their lower edges beveled outwardly or chisel-shaped and their adjacent walls inclined, the transverse spreading-bar fitting in the triangular opening thus formed, and the stem for actuating the valve, whereby the seat is freed from accumulation, the sediment collected, and the valve expanded, substantially as shown and described.

3. In a two-part gate-valve, the combination of the valve-chamber and the two valve-disks therein, having their lower edges beveled outwardly or chisel-shaped, and their adjacent walls inclined and provided with transverse ribs, with the spreader-bar fitting between said disks, whereby the cutting-edge is formed for freeing the seat from accumulation, and an opening is formed for receiving the said spreader-bar, substantially as shown and described.

WILLIAM G. ABEL.

Witnesses:

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SAMUEL GRUMBINE.