

(No Model.)

W. MITCHELL.
SLIDE VALVE.

No. 331,992.

Patented Dec. 8, 1885.

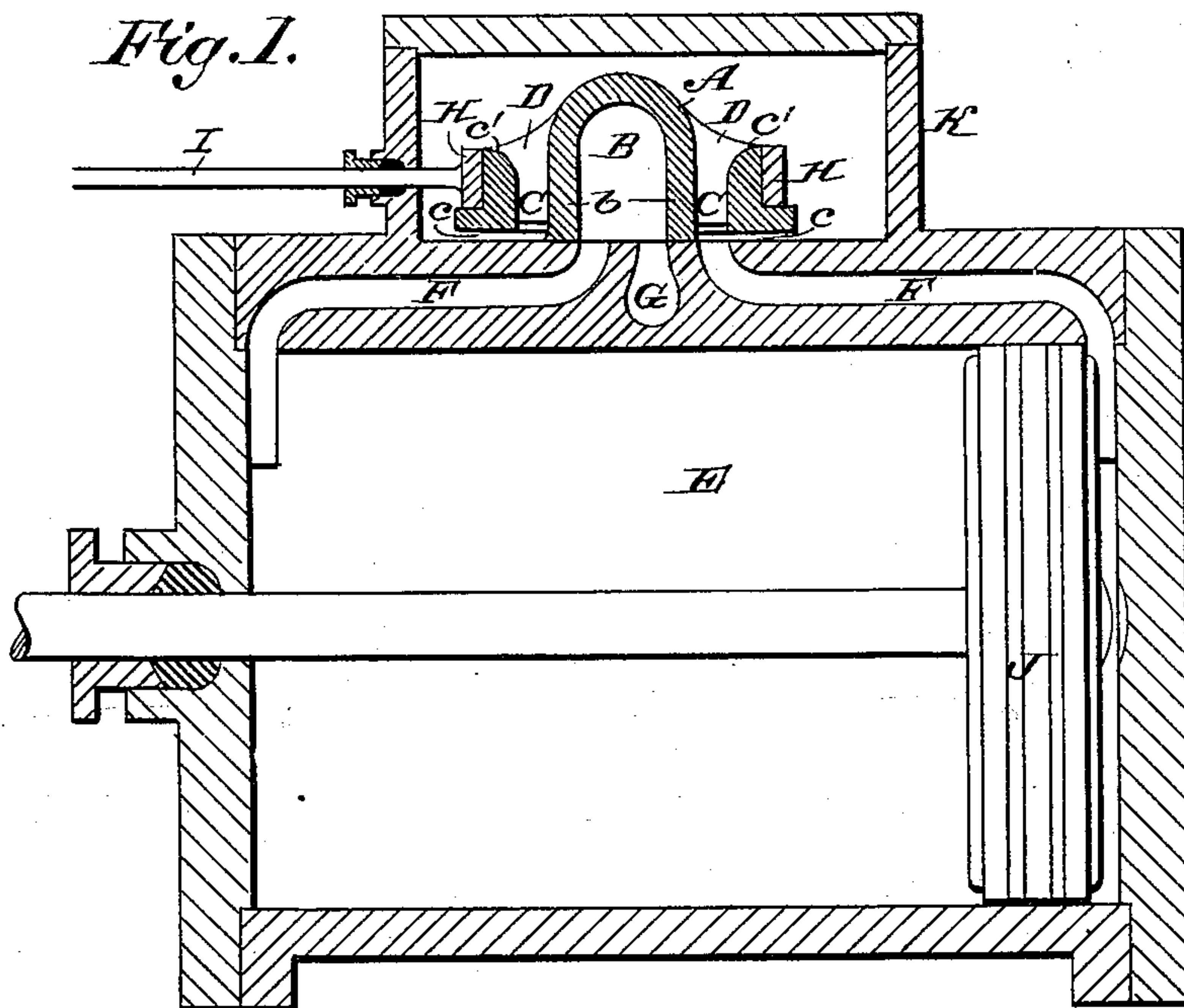


Fig. 2.

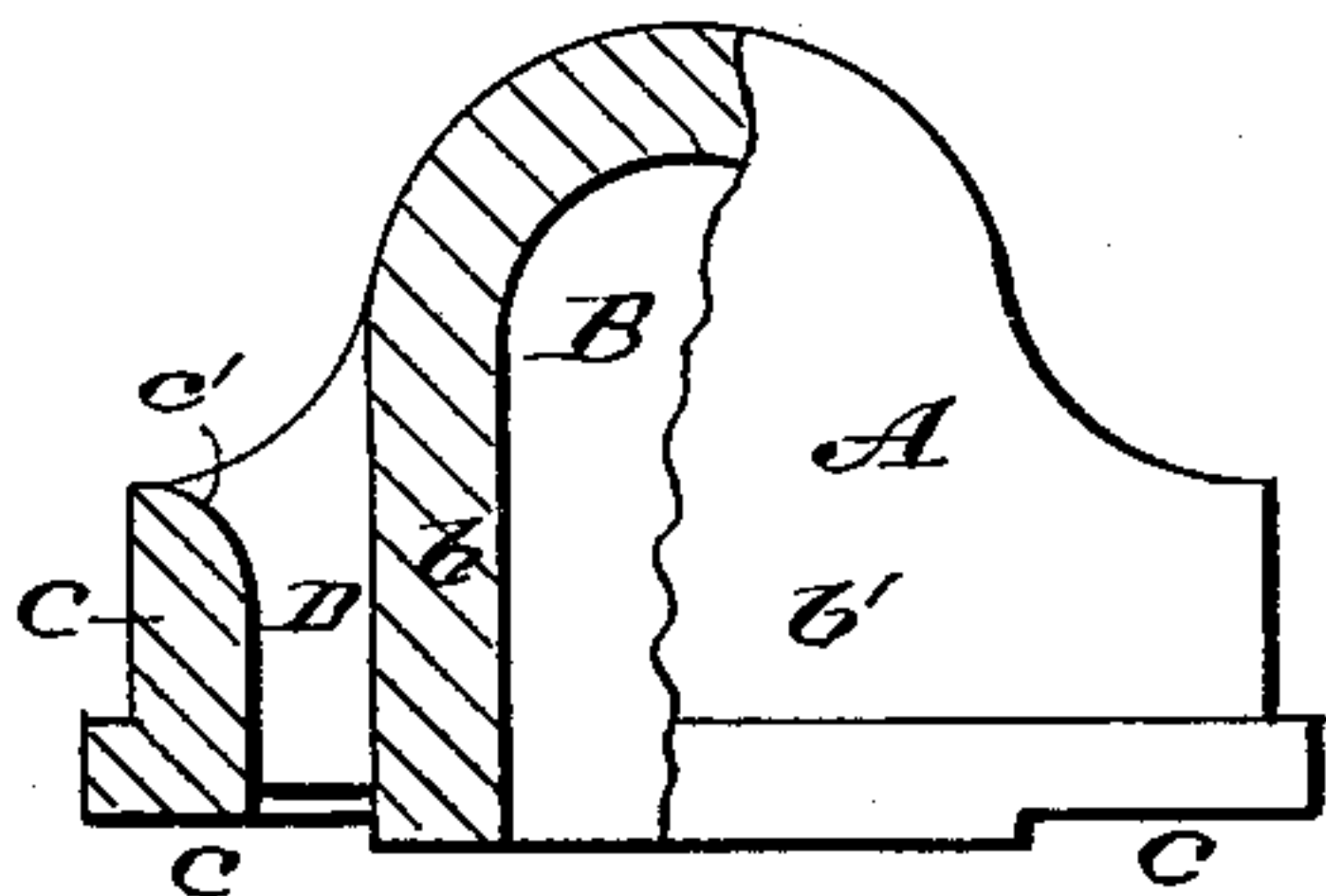
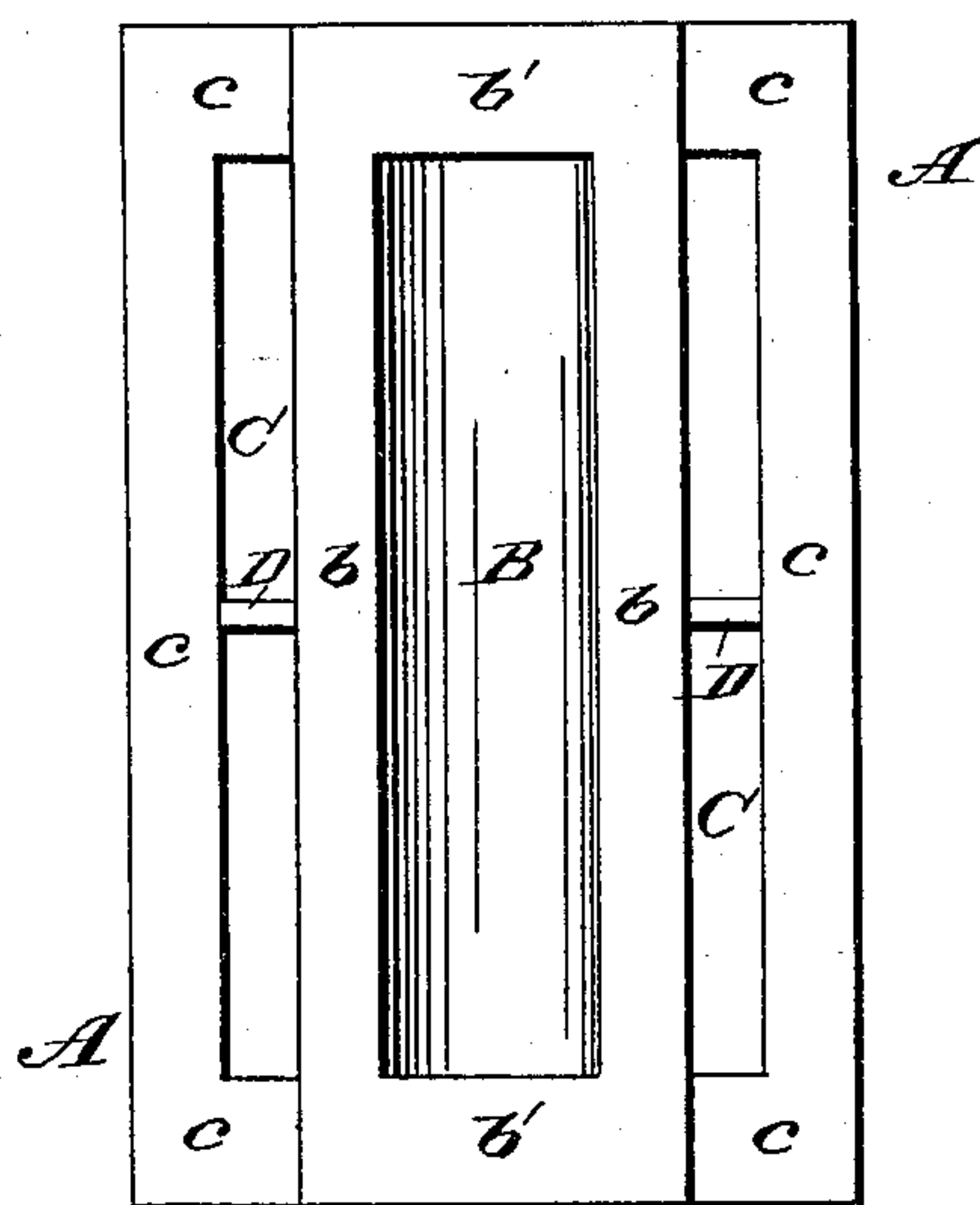


Fig. 3.



WITNESSES:

WITNESSES:
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UNITED STATES PATENT OFFICE.

WILLIAM MITCHELL, OF ALTOONA, PENNSYLVANIA.

SLIDE-VALVE.

SPECIFICATION forming part of Letters Patent No. 331,992, dated December 8, 1885.

Application filed March 20, 1885. Serial No. 159,555. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM MITCHELL, of Altoona, in the county of Blair and State of Pennsylvania, have invented a new and Improved Slide-Valve, of which the following is a full, clear, and exact description.

My invention relates to slide-valves, and has for its object to improve their construction, so as partly to equalize the pressure at both sides of the valve, and also to reduce the length of travel of the valve.

The invention consists in certain peculiar features of construction of the valve, all as hereinafter fully described and claimed.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a longitudinal sectional elevation of a steam-engine cylinder and piston with my improved slide-valve in operative position. Fig. 2 is an end view of the valve, partly broken away and in section; and Fig. 3 is a bottom or face view of the valve.

The letter A indicates the valve, which I make with a central exhaust chamber or cavity, B, formed by side walls, *b b*, which meet to form the closed top or outer side of the chamber, and end walls, *b' b'*, joining the side walls. At each side of the exhaust-chamber B a steam-inlet port, C, is formed clear through the body of the valve, and the tops or outer edges of the side bars or parts, *c c*, of the valve preferably are rounded over, as at *c' c'*, while the lower sides of the said bars or parts are adapted to stand slightly above the valve-seat, leaving spaces or passages thereat, as seen in Figs. 1 and 2, into or through which passes a portion of the steam passing from the ports C into the ports (presently described) of the piston-cylinder, the object of which will appear hereinafter.

The letters D D indicate webs or cross-pieces, which connect the parts *c c* with the side walls, *b b*, of the chamber B, so as to prevent bending or twisting of parts *c c*, and maintain the ports C C at uniform width throughout, and I prefer not to extend the webs D to the inner faces of parts *c c*, as indicated in Figs. 1 and 2.

The outer edges of the walls *b b b' b'* of ex-

haust-chamber B project beyond the plane of the side parts, *c c*, of the valve, and form the valve-face, which travels on the seat of the cylinder E over its steam-inlet ports F F and exhaust-port G, so that as the valve is reciprocated by means of a yoke, H, and connecting-rod I the steam will be let into and exhausted from the cylinder for driving the piston J, in the usual manner.

It is evident that the steam in the chest K, passing through the ports C and into the spaces between the face of the valve and its seat, will act beneath the side parts, *c*, of the valve, while the steam entering the chamber B will act upon the under side of the central portion of the valve, the joint effect of which is to quite fully equalize the steam-pressure on the valve, which thus will be nearly balanced and will work with minimum friction on the valve-seat, greatly lessening the wear of the contact-surfaces, and with the arrangement of the valve-ports C C as described the valve and cylinder ports may be lengthened and made narrower to admit the same quantity of steam to the cylinder at each half-stroke of the piston with less length of travel of the valve. Furthermore, when the steam in the steam-chest is not entering the cylinder it will, nevertheless, fill the valve-ports, and also the spaces or passages beneath the valve, the pressure of which steam will be received upon the valve-seat, not upon the valve, thus serving to equalize the pressure upon the valve when the valve is at rest.

More than one of the webs D may be used across each port C, depending on the length of the port, as will readily be understood.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

A slide-valve constructed with a central exhaust-chamber, B, a steam-port, C, at each side of said chamber, and with the parts *c c* at each side of the exhaust-chamber standing back of the plane of the contact-faces of the chamber-walls, which form the valve-face, substantially as herein set forth.

WILLIAM MITCHELL.

Witnesses:

W. F. TAYLOR,
JACOB SNYDER.