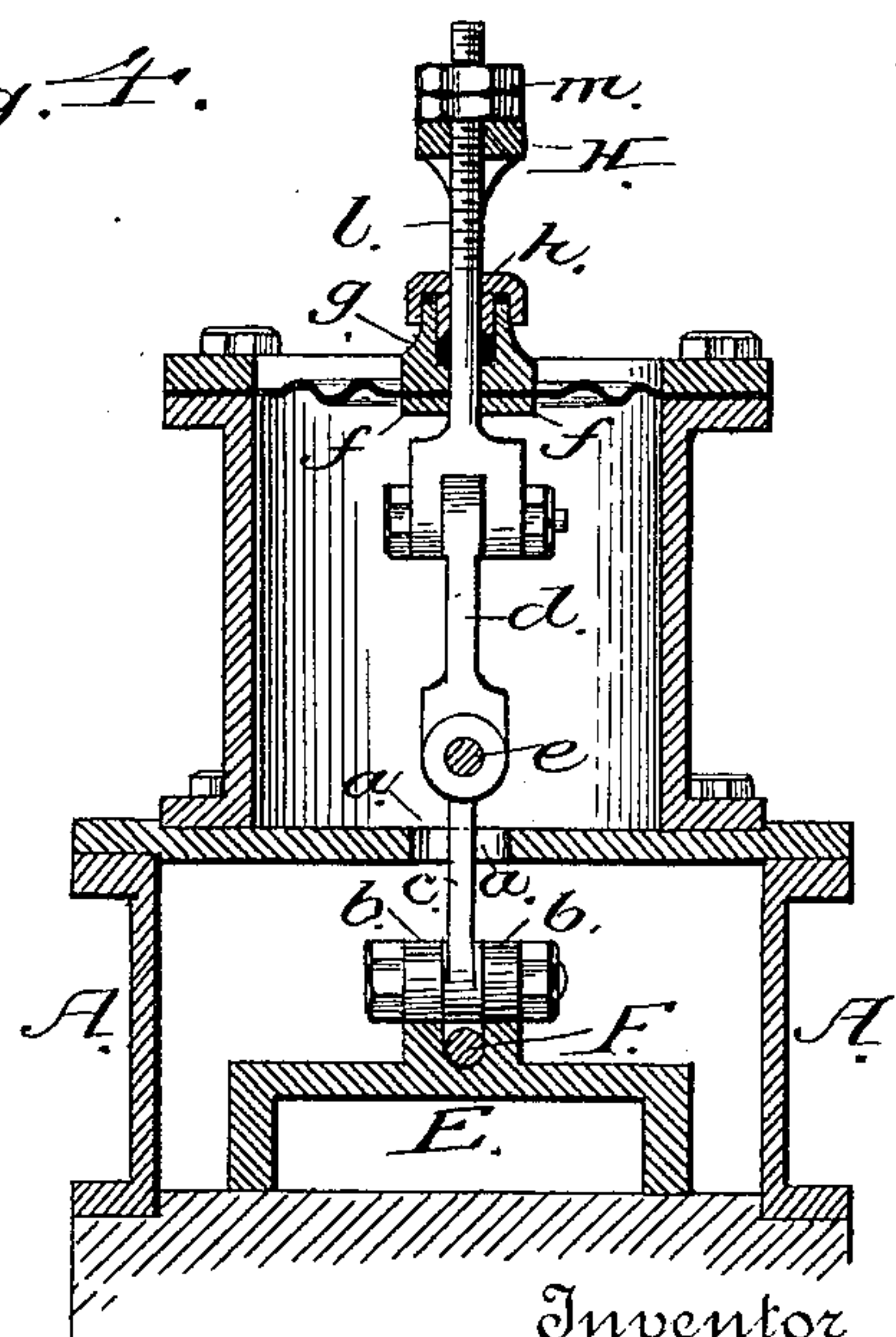
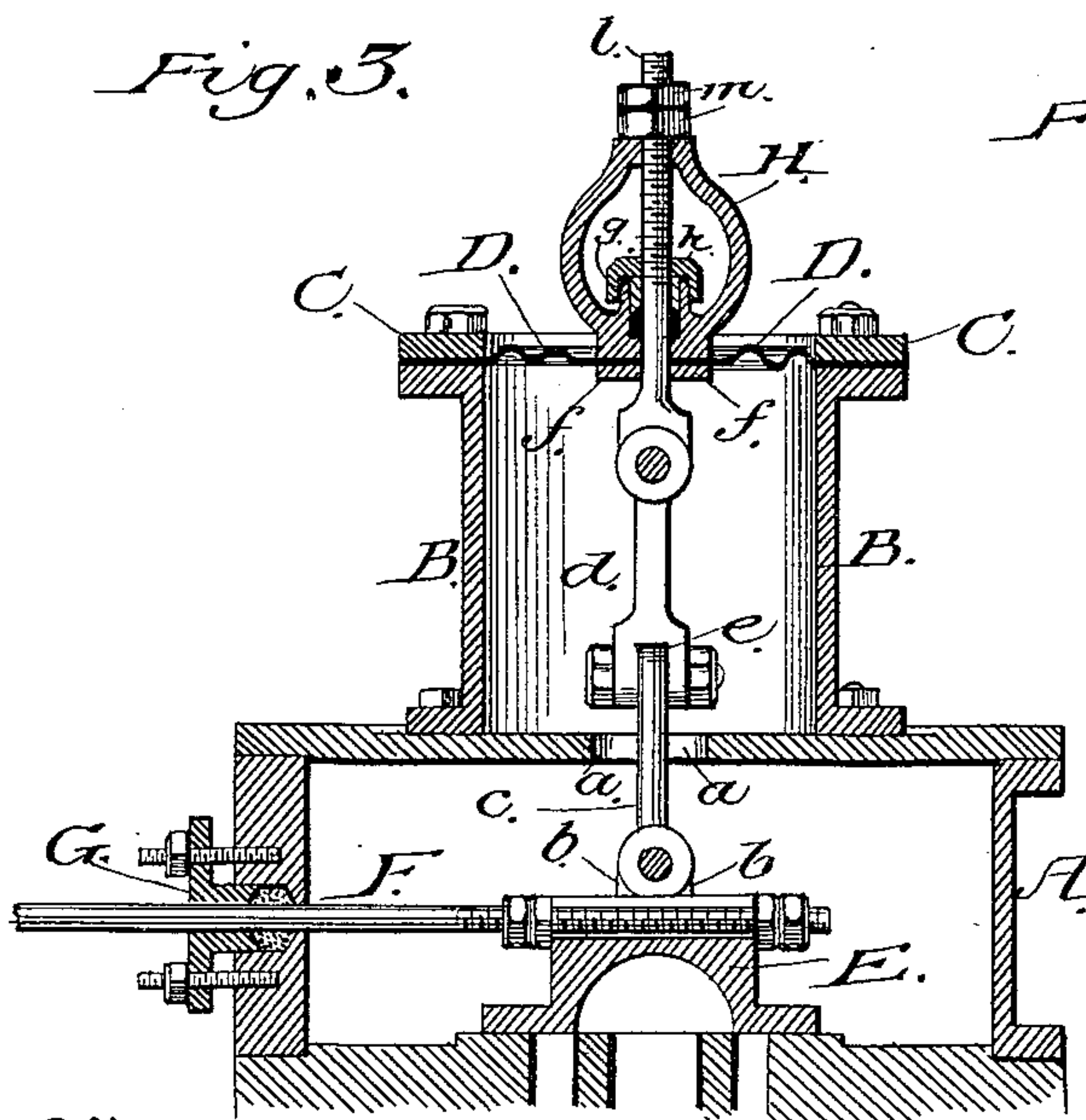
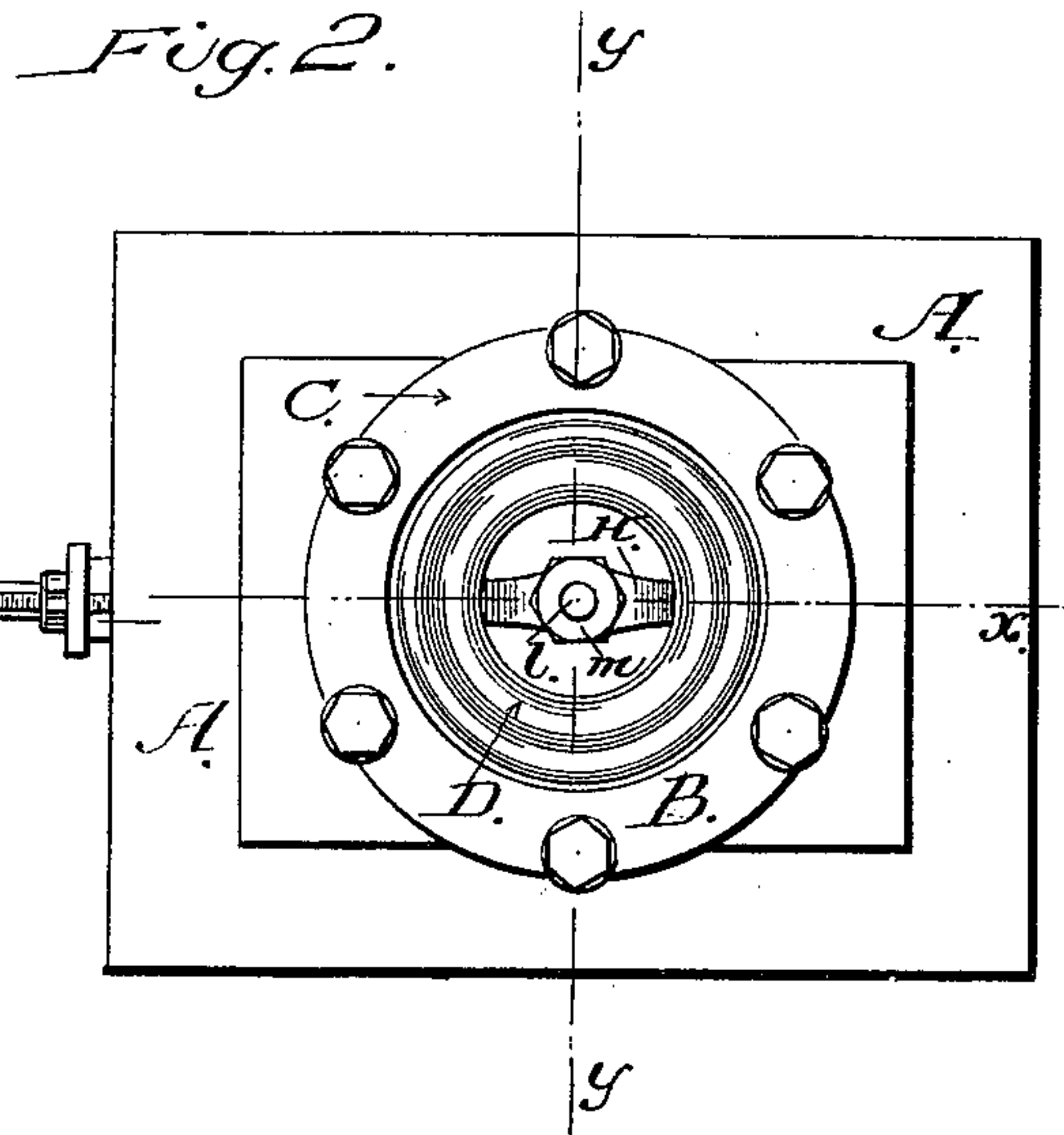
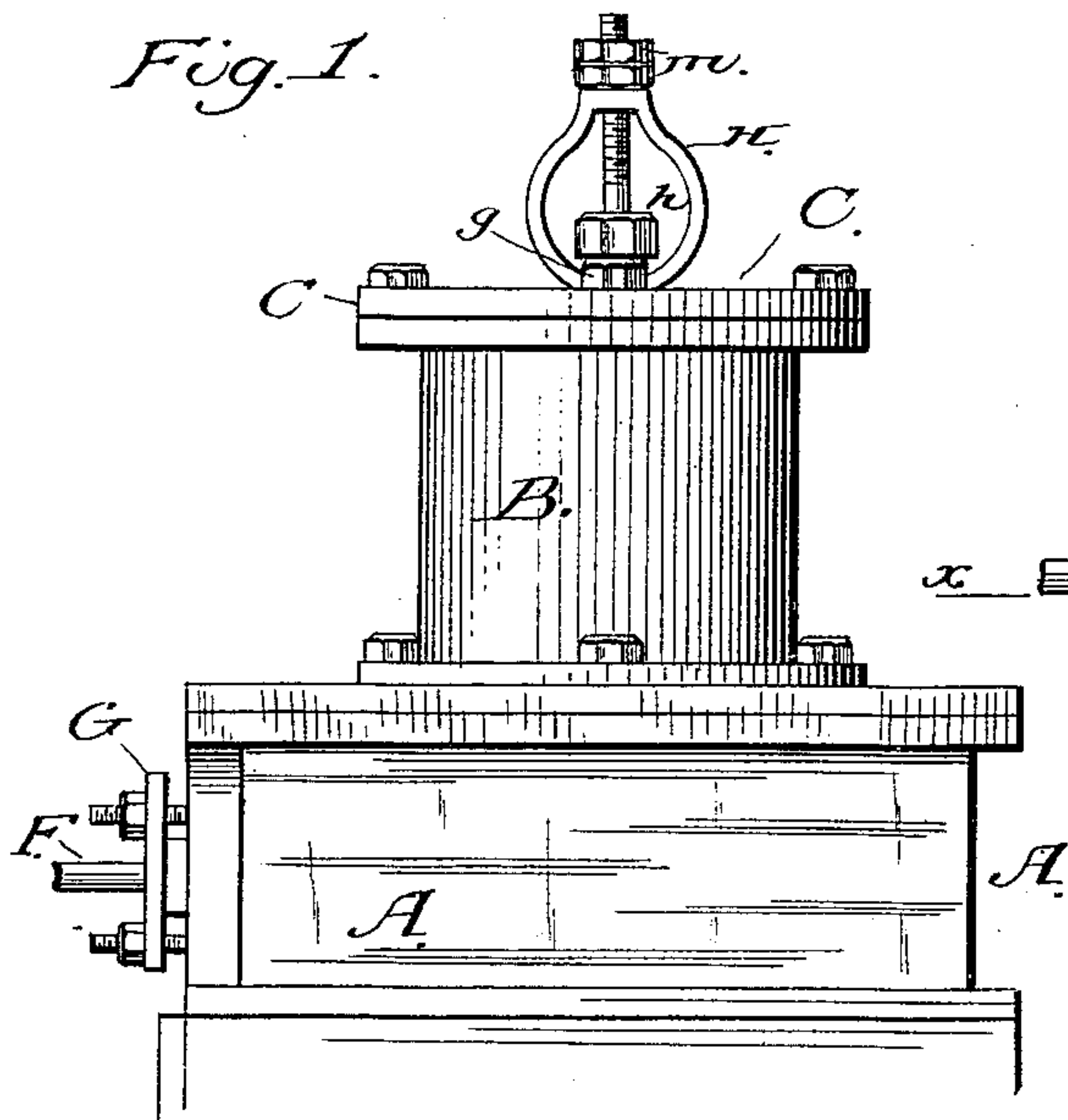


(No Model.)

W. I. BETTIS.  
BALANCED SLIDE VALVE.

No. 350,718.

Patented Oct. 12, 1886.



Witnesses

J. W. Fowler  
H. B. Applewhite,

Inventor

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By his Attorneys

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# UNITED STATES PATENT OFFICE.

WILLIAM IRVIN BETTIS, OF ORANGE, TEXAS, ASSIGNOR OF ONE-HALF TO  
D. MORRISON, OF SAME PLACE.

## BALANCED SLIDE-VALVE.

SPECIFICATION forming part of Letters Patent No. 350,718, dated October 12, 1886.

Application filed June 23, 1886. Serial No. 205,993. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM IRVIN BETTIS, a citizen of the United States, residing at Orange, in the county of Orange and State of Texas, have invented certain new and useful Improvements in Balanced Slide-Valves, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation of a steam chest with my improvements applied thereto. Fig. 2 is a plan view of the same. Fig. 3 is a sectional view on the line *x x* of Fig. 2. Fig. 4 is a similar view on the line *y y* of Fig. 2.

My invention relates to certain improvements applied to slide-valves for counterbalancing the pressure on the valve; and it consists in the peculiar construction and combination of devices which I shall hereinafter fully describe and claim.

To enable others skilled in the art to which my invention appertains, I will now describe its construction and indicate the manner in which the same is carried out.

In the said drawings, A represents a steam-chest of any suitable construction, having the usual valve-seat for a reciprocating slide-valve; and B represents a chamber bolted to the top of the steam-chest, with its lower end in communication with the steam-chest through an opening, *a*, formed in the top of said chest. Between the upper end of the chamber B and a cap or plate, C, bolted thereto is placed a diaphragm, D, whose surface may be either corrugated or plain. The valve E may be of the usual form of slide valve, and is connected with an adjustable valve-stem, F, which passes through a packing-gland, G, as illustrated in Fig. 3. From the construction and arrangement of these features it is clearly manifest the steam-pressure in the steam-chest presses down upon the valve and up under the diaphragm, whereby the pressure on the diaphragm counterbalances the pressure on the valve. From the upper side of the valve there project lugs *b*, between which is pivotally secured the lower end of a link, *c*, whereby the valve is permitted to vibrate in the direction of its travel. The upper end of the link *c* is attached to a link, *d*, by a connection,

*e*, similar to that which secures the lower end of the link *c*, although the connection *e* is arranged at right angles to the first connection, whereby the valve may have a lateral movement to adjust itself to its seat. A frame, H, cast or otherwise formed, is secured to the diaphragm with the aid of a collar or washer, *f*, and is provided with a packing-box, *g*, and packing-gland *h*, through which passes a stem or rod, *l*, whose lower end is pivotally secured to the link *d* in a manner similar to the connections previously described. The upper end of the stem *l* is threaded and passes through the top of the frame H, and is secured by suitable jam-nuts, *m*, whereby the length of the connection previously described is adjusted. I am thus enabled to attach a counter-balance to the slide-valve which, for simplicity, economy, and durability, is far superior to many of the devices used for accomplishing the same purpose at the present time. In addition to this, the attachment is readily applied to the common slide-valve without any material alteration of said valve, as the lugs *b* may be screwed or riveted to the top of the valve without departing from the spirit of my invention.

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

1. The steam-chest, a valve sliding therein, and a chamber above the steam-chest and in communication therewith, in combination with a frame, H, and a diaphragm, D, mounted on top of the chamber, and adjustable link-connection between the diaphragm and valve, whereby the latter may have longitudinal and lateral adjustment, substantially as described.

2. The steam-chest, a valve sliding therein, a chamber on top of the steam-chest, and a diaphragm in the top of the chamber and secured by a cap or plate, in combination with a frame, H, having a packing-box and gland, an adjustable threaded stem or bolt passing through the frame, and the double-link connection between the said stem and valve, substantially as described.

WILLIAM IRVIN BETTIS.

Witnesses:

S. W. SHOLARS,  
JNO. T. HART.