

(No Model.)

2 Sheets—Sheet 1.

P. KRICKL.
SLIDE VALVE.

No. 363,750.

Patented May 24, 1887.

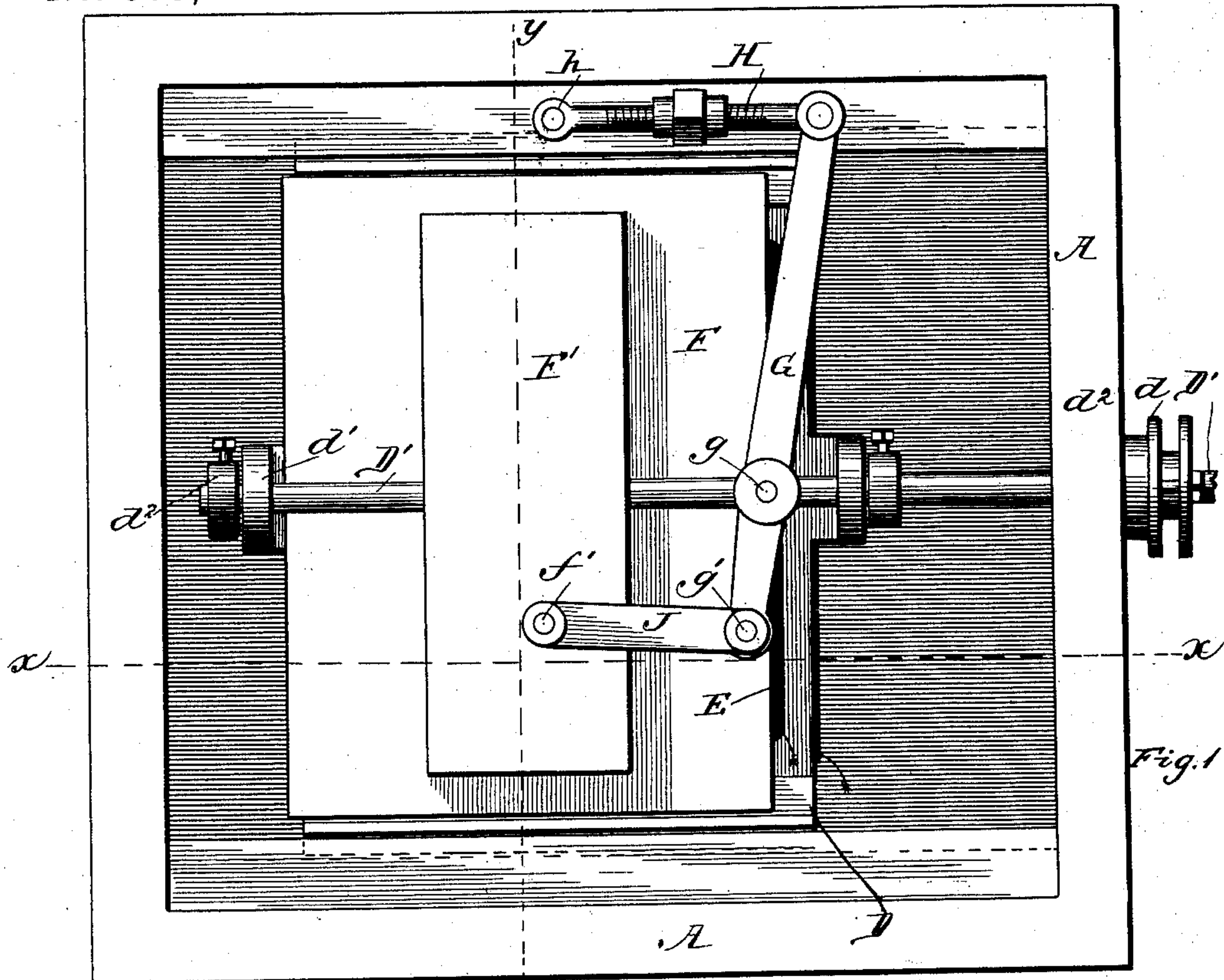


Fig. 1

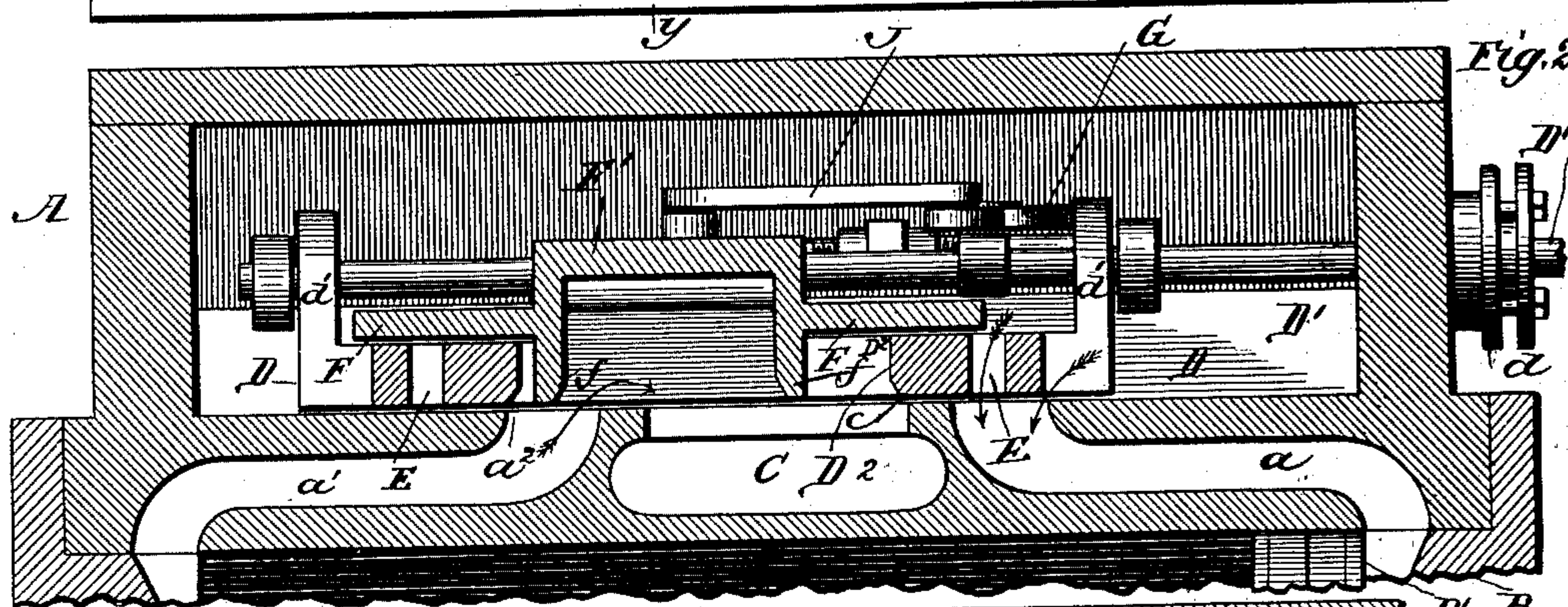


Fig. 2

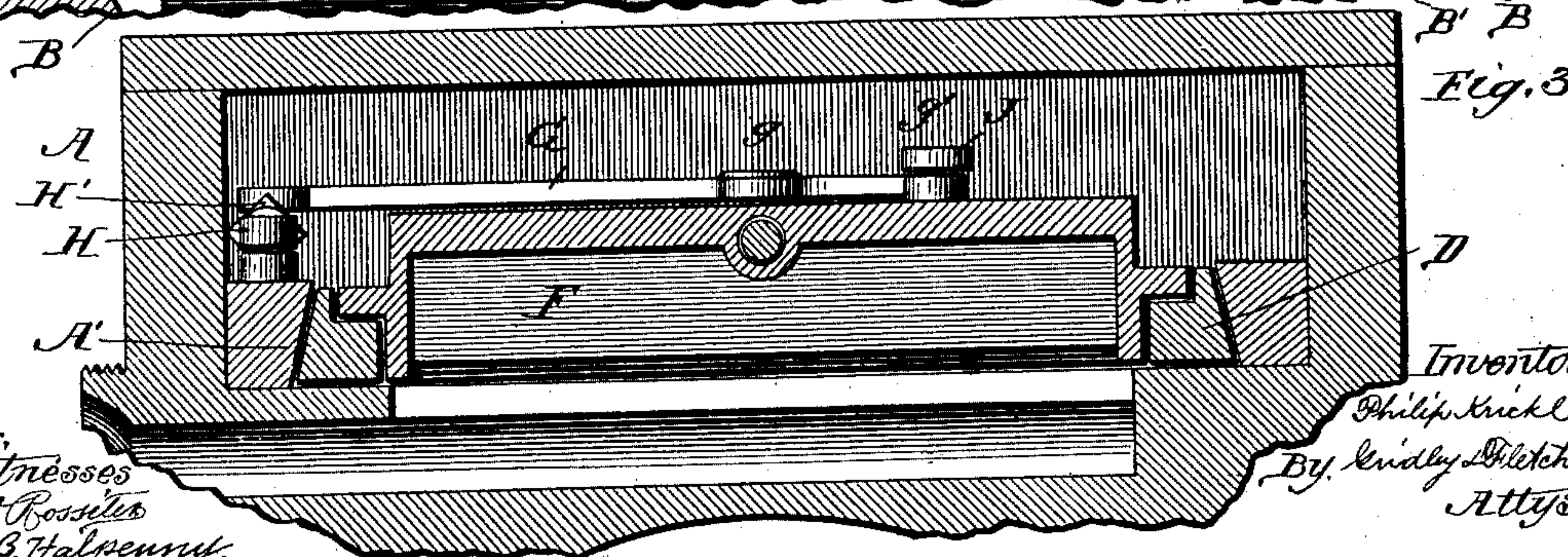


Fig. 3.

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Fig. 4.

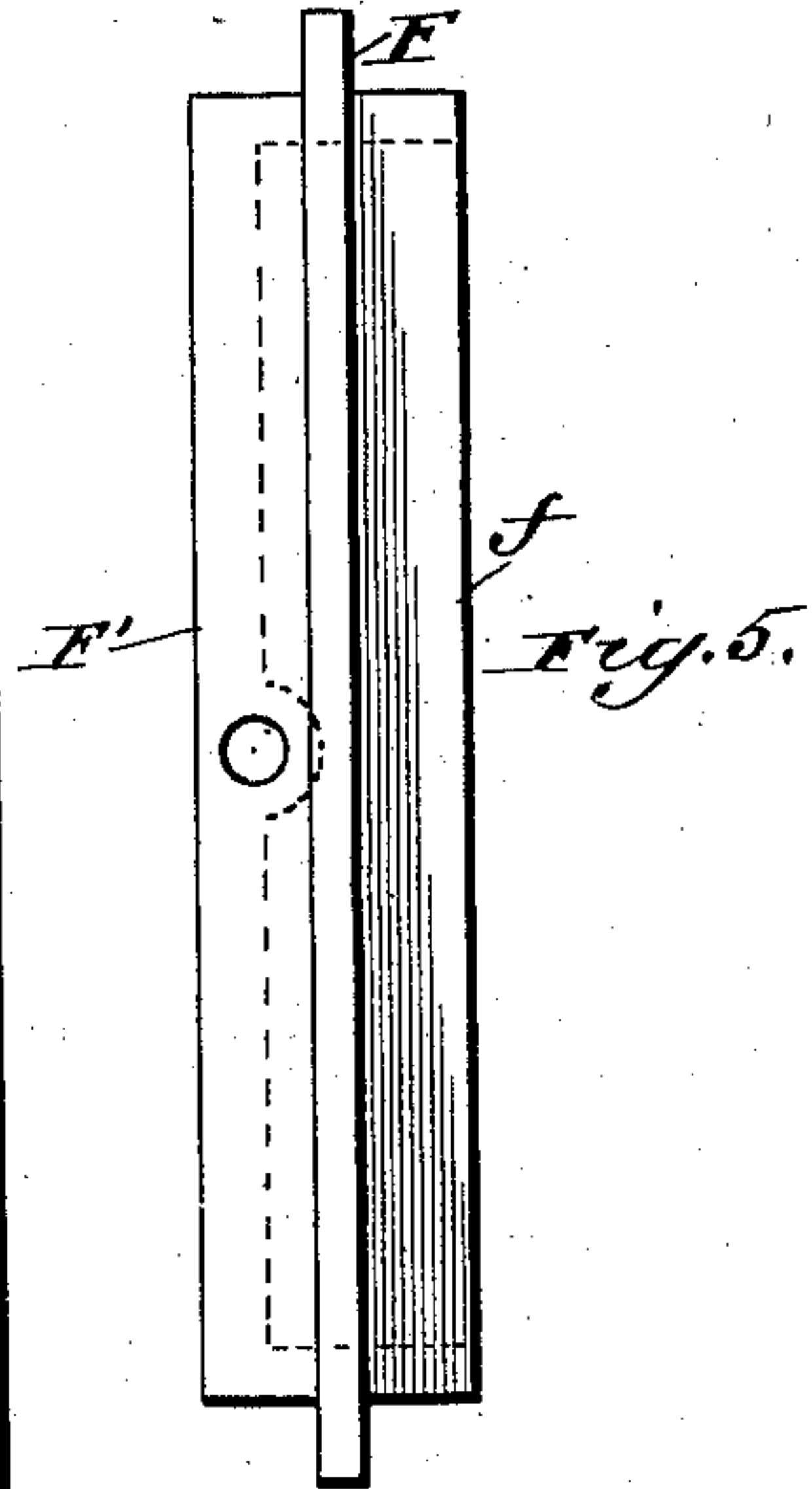
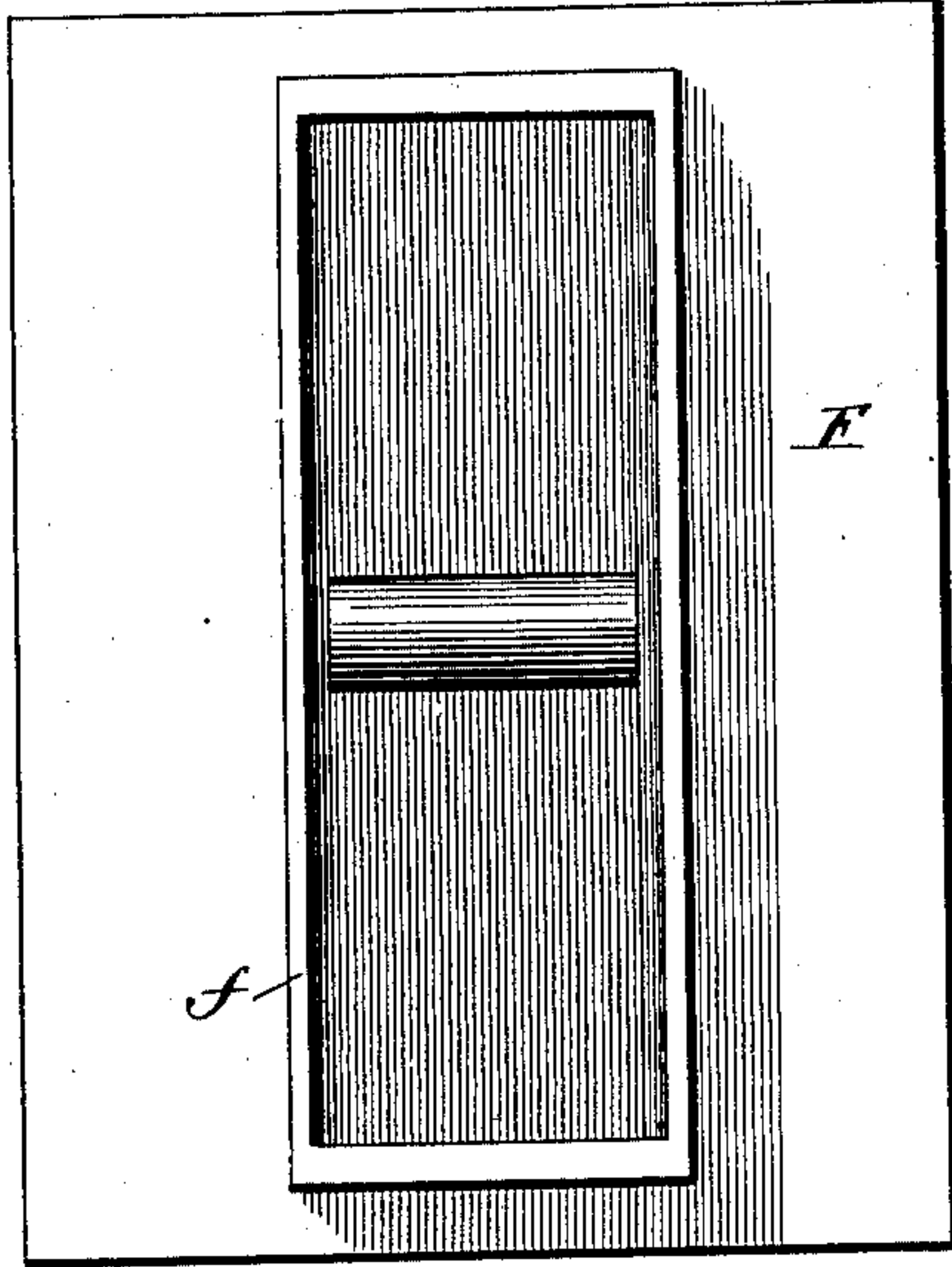
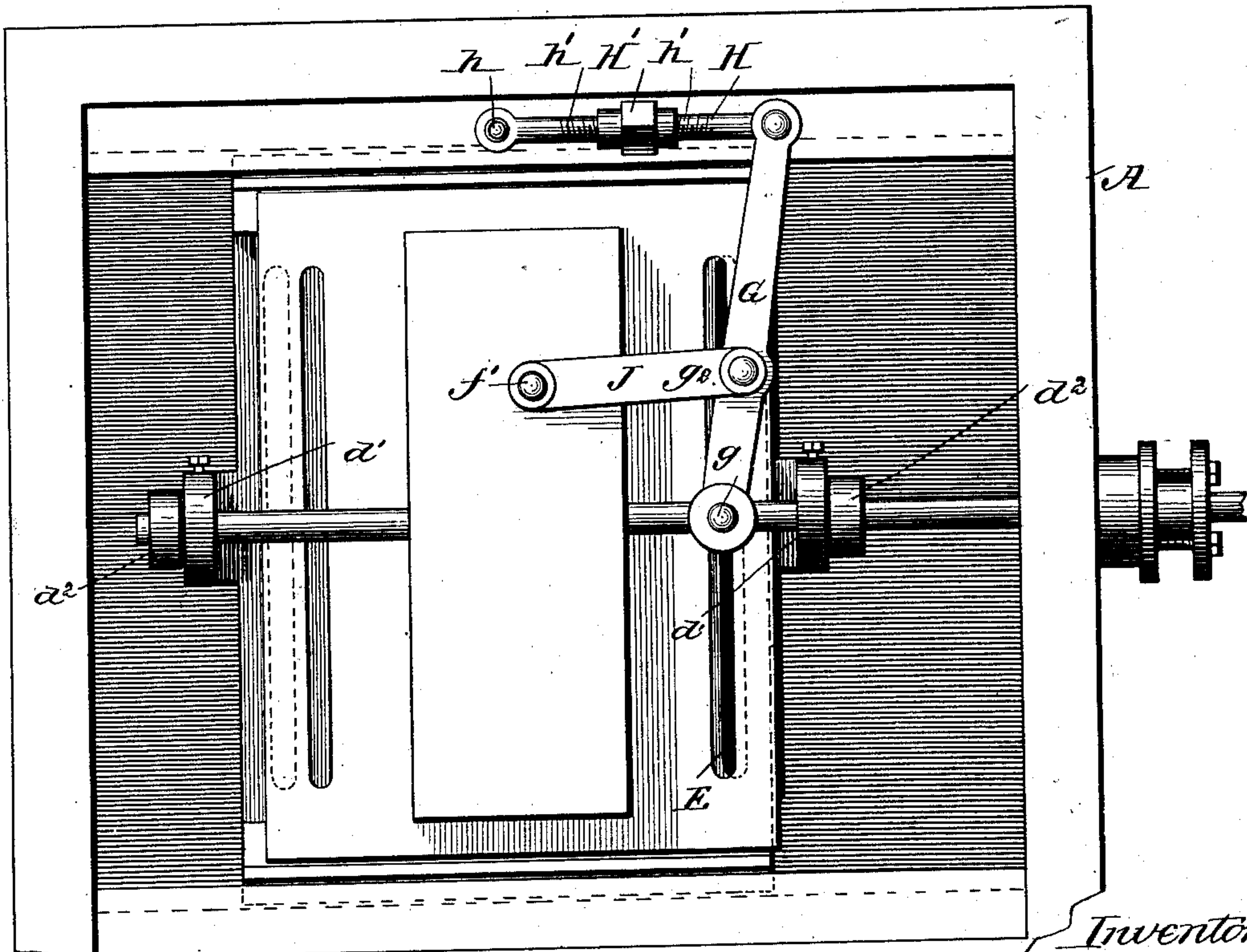


Fig. 6.



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UNITED STATES PATENT OFFICE.

PHILIP KRICKL, OF CHICAGO, ILLINOIS, ASSIGNOR TO DENNIS O. B. LADD,
OF SAME PLACE.

SLIDE-VALVE.

SPECIFICATION forming part of Letters Patent No. 363,750, dated May 24, 1887.

Application filed August 6, 1886. Serial No. 210,171. (No model.)

To all whom it may concern:

Be it known that I, PHILIP KRICKL, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Slide-Valves for Engines, of which the following is a description, reference being had to the accompanying drawings, in which—

Figure 1 is a plan view. Fig. 2 is a longitudinal sectional view taken upon the line $x x$, Fig. 1, viewed in the direction of the arrow there shown. Fig. 3 is a transverse sectional view taken upon the line $y y$, Fig. 1, viewed in the direction of the arrow there shown. Fig. 4 is a bottom view in detail of the supplemental valve. Fig. 5 is a side or edge view of said supplemental valve; and Fig. 6 is a plan view of a modification of said valve in which the relative movements of the parts are reversed.

Like letters of reference indicate like parts in the different figures.

The object of my invention is to provide a compound sliding valve for steam-engines which may be so constructed as to produce an accelerating initiatory movement of the supplemental valve, whereby a high initial pressure may be obtained at the beginning of the piston-stroke, while at the same time a release is provided for compression in the opposite end of the cylinder, continuing throughout, or nearly throughout, the entire stroke, so that the full effective power of the expansion may be utilized without the usual counteracting forces, all of which is hereinafter more particularly described, and definitely pointed out in the claims.

In the drawings, A represents the walls or plates of the steam-chest, while B is the cylinder connected with said steam-chest by means of steamways $a a'$, Fig. 2.

C represents the usual exhaust-port.

D is the main valve connected directly with the valve-rod D' , which passes through the usual stuffing-box, d , and is attached to lugs d' , cast or otherwise formed upon the respective sides of the valve D. Collars $d'' d''$ are attached to said valve-rod, so as to bear against said lugs, and are rigidly secured in place by means of set-screws, or in any well-known manner.

E E' are admission-ports in the main valve, through which steam is intended to be admitted in addition to that which is ordinarily admitted at the end of the valve, the intention being to admit the steam through both places at the same time, so that twice the volume may be admitted during a given movement of the valve. I am enabled to accomplish this result by means of a supplemental valve, F, which consists of a plate having a raised oblong part, F', and depending flanges f , the whole being box-shaped and open at the bottom, as shown. The supplemental valve F rests flatly and loosely upon the main valve D, the latter having an oblong opening, D^2 , formed therein for the reception of the lower portion or flanges, f , of the box-part F', which flanges extend to and rest upon the main valve-seat. Said opening is of about sufficient width to extend from the outer edge of one of the steamways to the opposite outer edge of the exhaust-port C, or from the point a^2 to c , Fig. 2, thus permitting a longitudinal play therein of the depending portion of the box F', which is given a different and independent movement from that of the main valve D, as hereinafter shown.

Pivotally attached to a wrist-pin, g , secured to the valve-rod, is a lever, G, one end of which is attached to a link, H, pivotally attached, preferably at h , to a ledge, A', Fig. 3, upon the interior of the steam-chest. Said link H is made in two parts having right and left hand screw-threads h' , upon which is screwed a union-nut, H', by means of which said link may be lengthened or shortened at will. Preferably upon the opposite end of the lever G, I provide a wrist-pin, g' , Fig. 1, to which is loosely attached a link, J, the opposite end of which is loosely attached to a wrist-pin, f' , projecting upwardly from the part F' of the valve F. The valve D is directly reciprocated by the valve-rod D' , while the supplemental valve F' is actuated by the link J, which is in turn moved by the lever G. Thus it is obvious that the initial movement of the supplemental valve is as much faster than that of the main valve as the velocity of the free end of the lever is in excess of that of the valve-rod. This movement per-

mits a considerable opening of the admission-ports E simultaneously with that at the end of the valve, as indicated by the darts at the right in Figs. 1 and 2, so that a large volume of steam is admitted behind the piston B', Fig. 2, at the beginning of the stroke, thus utilizing the full force of the steam at the moment when it is most needed. On the other hand, the movement of the opposite side of the valve is such as to afford ample opportunity for the full and free escape of the compressed steam throughout the stroke.

Said device may be modified and a slower movement given to the supplemental valve by attaching the free end of the lever G to the valve-rod and pivoting the link J midway between, as at g^2 , Fig. 6; but I prefer the construction shown in Fig. 1, in that it gives an accelerating movement to the supplemental valve, thereby producing a high initial pressure. The arrow in the steamway a' shows the movement of the steam into the exhaust-port C, which, it is obvious, must remain open a sufficient time to avoid unnecessary compression.

It is obvious that the lever G may be placed upon the outside of the steam-chest and the link J elongated, so as to form a secondary valve-rod connecting with the supplemental valve, whereby the same result may be accomplished without varying the essential features of my invention.

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

1. A main slide-valve provided with ports at or near its respective ends for the admission of steam to the steamways of the cylinder, in addition to that admitted at the ends of said valve, and a supplemental valve for opening and closing said ports.

2. A slide-valve provided with ports at or near its respective ends for the admission of steam to the steamways of the cylinder, in addition to that at the ends of said valve, combined with a supplemental valve for opening and closing said ports, and means, as a lever pivoted to the valve-rod and connected with said supplemental valve, for imparting

an accelerating motion to the latter, substantially as and for the purposes set forth.

3. The combination of a main slide-valve having ports at or near its respective ends, with a supplemental valve for opening and closing said ports, having an exhaust-cavity therein provided with flanges which extend downwardly through an enlarged opening in the main valve to the valve-seat, and means for imparting to said supplemental valve a greater relative throw than is given to the main valve, substantially as and for the purposes specified.

4. The combination of a main slide-valve having ports at or near its respective ends, with a supplemental valve for opening and closing said ports, said supplemental valve having an exhaust-cavity therein provided with depending flanges which rest upon the valve-seat, and said main valve having an opening therein for the reception of said flanges, of sufficient size to permit a longitudinal play of said depending portion of the supplemental valve, and means for imparting to the latter a greater throw than is given to the main valve, substantially as and for the purposes set forth.

5. The combination, with the valve D, having ports E E and opening D^2 , of the supplemental valve F, provided with part F' and depending flanges f' , and means, as the lever G and link-connections H J, for imparting an accelerating motion thereto, whereby a high initial pressure may be imparted at the beginning of the stroke and unnecessary compression may be released, substantially as and for the purposes specified.

6. In a compound slide-valve, the supplemental valve F, provided with box-shaped portion F' , having an interior cavity open at the bottom and depending flanges arranged to slide upon the main valve-seat, and means for reciprocating said supplemental valve, substantially as and for the purposes set forth.

PHILIP KRICKL.

Witnesses:

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