

F. F. LANDIS.
Slide-Valves.

No. 156,026.

Patented Oct. 20, 1874.

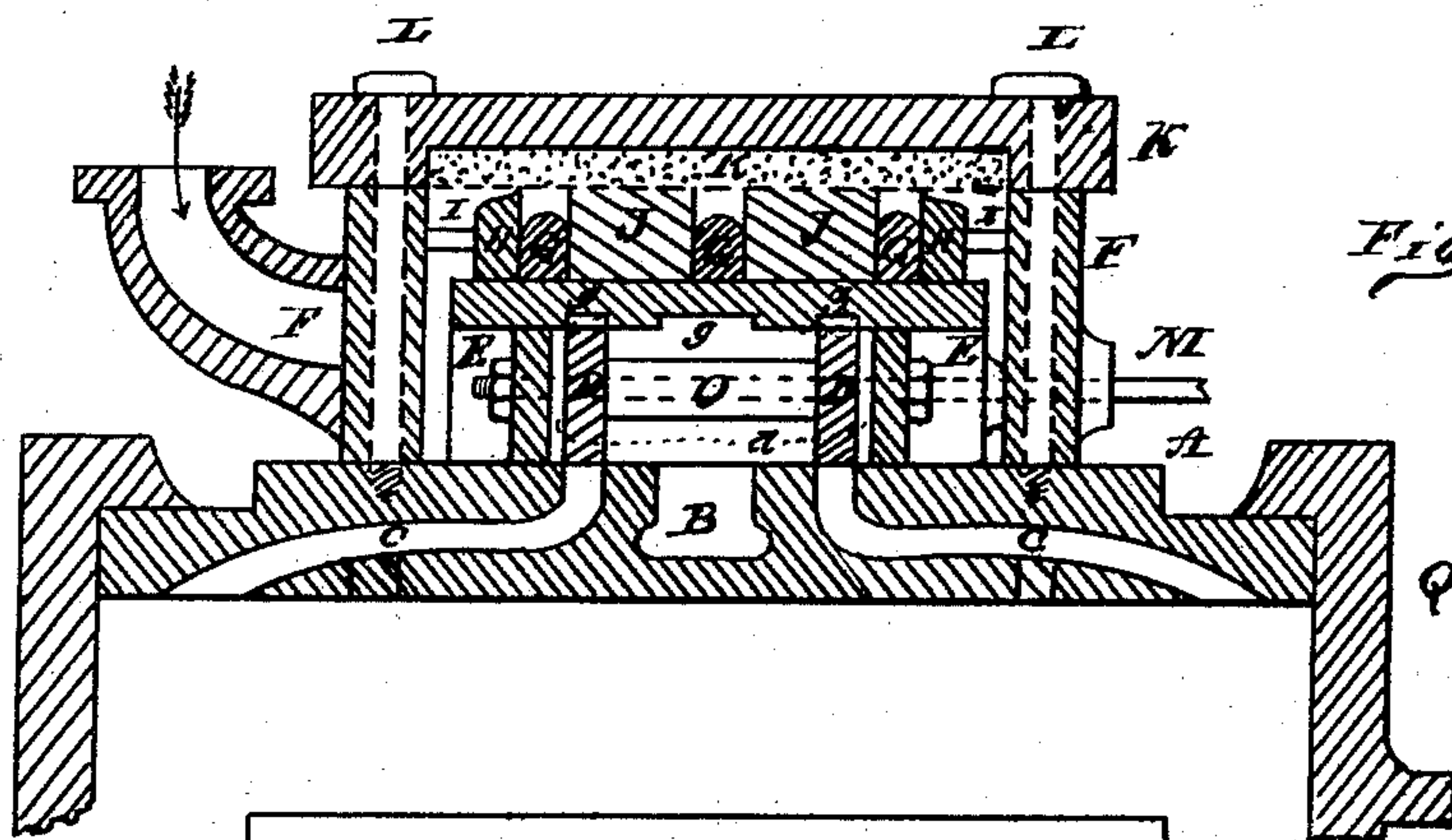


Fig. 1.

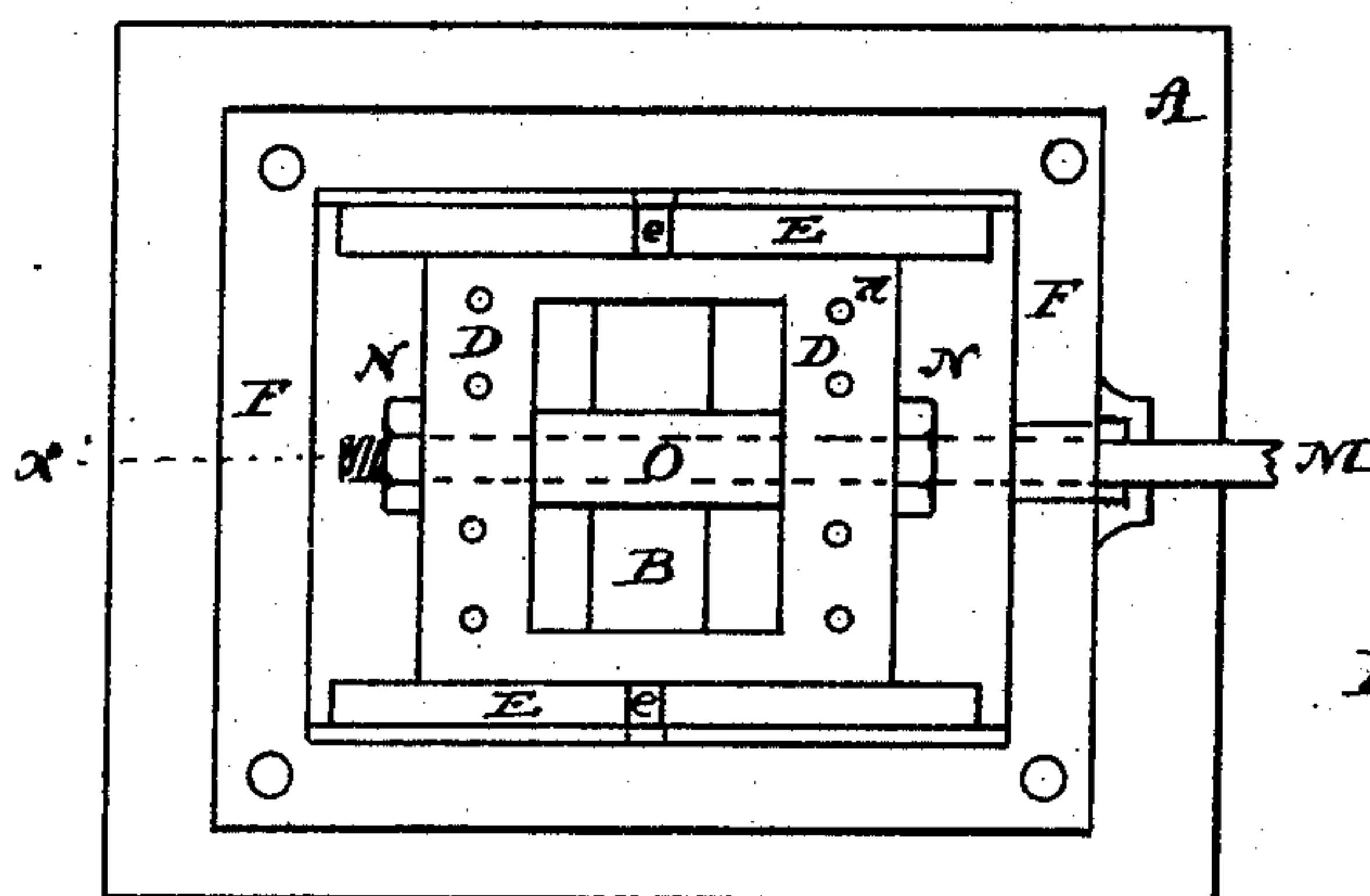


Fig. 2.

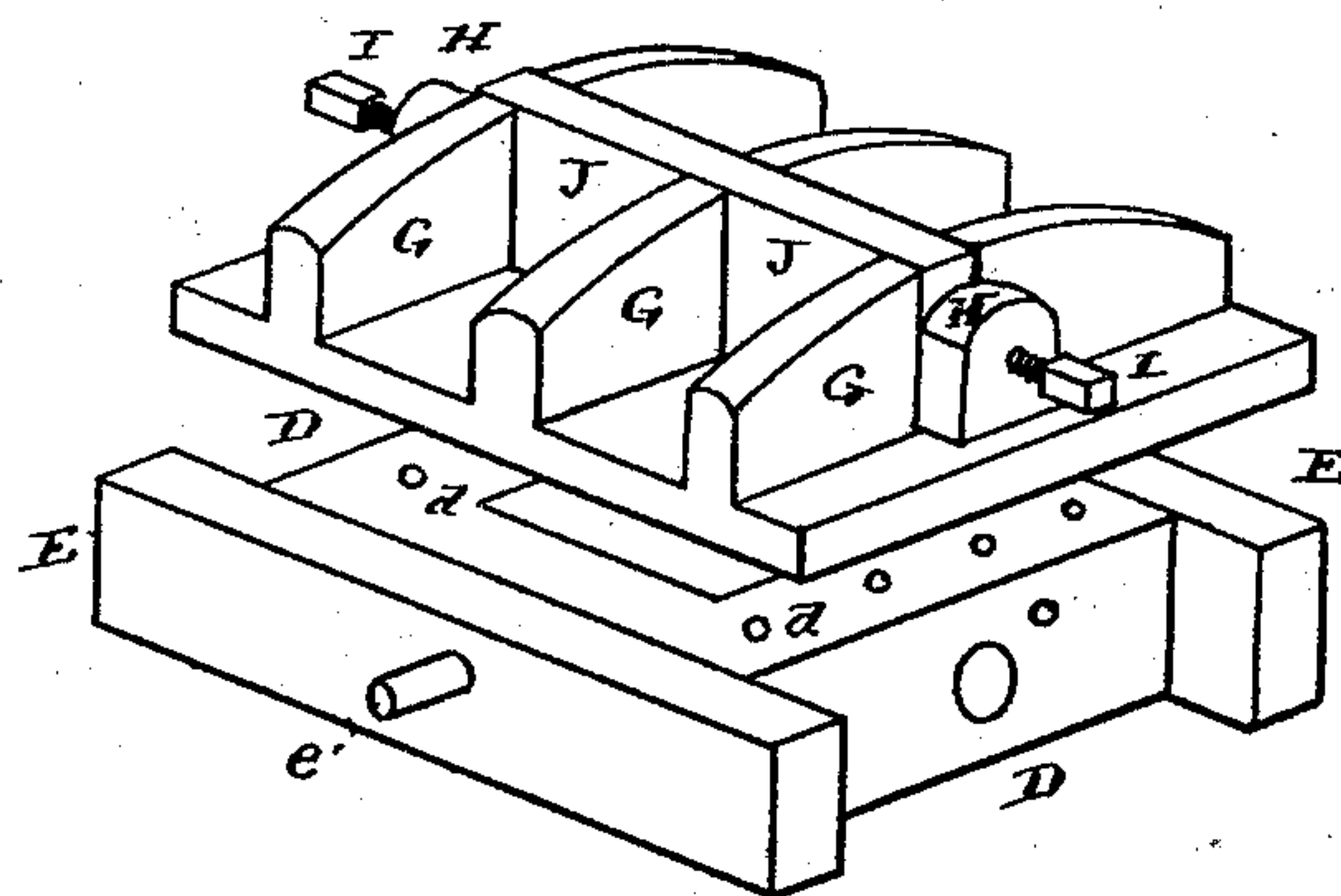


Fig. 3.

·WITNESSES·

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IMPROVEMENT IN SLIDE-VALVES.

Specification forming part of Letters Patent No. **156,026**, dated October 20, 1874; application filed July 22, 1874.

To all whom it may concern:

Be it known that I, FRANK F. LANDIS, of the city of Lancaster, in the county of Lancaster and State of Pennsylvania, have invented new and useful Improvements in Slide-Valves, of which the following is a specification, reference being had to the accompanying drawings and letters marked thereon, which will enable those skilled in the art to make and use the same, in which—

Figure 1 is a vertical section of a steam-chest with my improvements in place, and portion of a cylinder. Fig. 2 is a plan view, with the covers removed. Fig. 3 shows the improvement in perspective, detached.

The object of this invention is, first, to form such a communication between the ports, valve, and steam-chest as to equalize and diffuse the pressure, in such a manner as to prevent all undue friction and consequent wear of the valve, and so as to require no compensating device; in the second place, to provide a means to relieve the strain on the cylinder or valve and rod in cases of sudden excess of pressure, by whatever cause induced. To produce these results I use perforations in the walls of the valve, side bearings, between which the valve moves, and a cover over the valve and side pieces, which may be raised vertically, but not laterally or back and forth, by the action of the steam, as herein more fully set forth.

In Figs. 1 and 2, A designates the top of the cylinder, with its ports C C and exhaust B, surmounted by the steam-chest F, with its cover K, secured by the headed screw-bolts L, in the ordinary manner. The valve D has a central sleeve or tube, O, for the passage of the valve-rod M, and secured by jam-nuts N, in the usual way. I show separate side pieces E E, nearly the length of the interior of the steam-chest, to which they are fastened, and between which the valve D has its motion. The thickened ends of said valve have a series of perforations, *d*, allowing a communication between the ports and corresponding shallow cavities *g* made in the lid of the valve-chamber, in its under face. The top of this lid or cover is strengthened by any number of cross-ribs or flanges, G, and central crest J, to secure it effectually against any amount of press-

ure. This cover has a boss, H, on each end for an adjusting-screw, I, so as to adjust it and hold it in position. This fits accurately upon the upper edge of the side pieces E and valve D, having neither lateral nor longitudinal motion; but provision is made, by forming a recess, *k*, in the lid or cover K of the steam-chest, or otherwise, so that it can rise and fall vertically, when undue pressure is acting upon the cylinder, to relieve it, and allow it to raise the said valve-cover, thereby preventing a sudden pressure from beneath to lift the valve from its seat, as is the case with the common slide-valve when the cover is fixed, causing a heavy strain upon the cylinder; but the yielding cover, with its shallow recesses, as well as the perforations in the valve, combine to counterbalance all irregularities arising from a sudden check in the cut-off before the stroke is completed, or sudden condensation or counteraction of the exhaust.

It is confidently believed, as by actual experiment proved, that these desirable results are obtained by the construction and arrangement as shown by Fig. 3.

It may seem that the fixed side pieces E might as well be a portion of the interior of the steam-chest, and cast with it; but I prefer to mold and cast them separately in the same flask with the valve, in order to secure the same density or quality of metal in the three parts.

My mode to proceed in planing up from the rough is, first, to plane off one of the sides of each plate, and the sides of the valve to match. I then drill a hole centrally through each plate, and also the sides of the valve, and with stout pins *e* combine the three pieces adjusted, and proceed to plane and finish them as if they constituted one solid piece. I then separate them, plug up the side holes in the valve duly dressed up, and fasten the side pieces to the sides of the steam-chest by means of a screw, countersunk, so as to present a smooth face to the action of the valve, (having its full motion between them,) and so that the top or cover rests equally upon the upper edges of the side pieces and the valve.

I am aware that various devices and improvements in slide-valves have been made and used; but I am not aware that a slide-valve

has ever been used having two of its walls perforated. Therefore,

What I claim as my invention in a slide-valve is—

In combination with the shallow chambers *g* in the valve-cover G J, the series of perforations *d* through the walls of the slide-valve D,

substantially constructed and operating in the manner and for the purpose specified.

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Witnesses:

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