

(No Model.)

2 Sheets—Sheet 1.

J. G. MINER.
BALANCED SLIDE VALVE.

No. 314,258.

Patented Mar. 24, 1885.

Fig. 1.

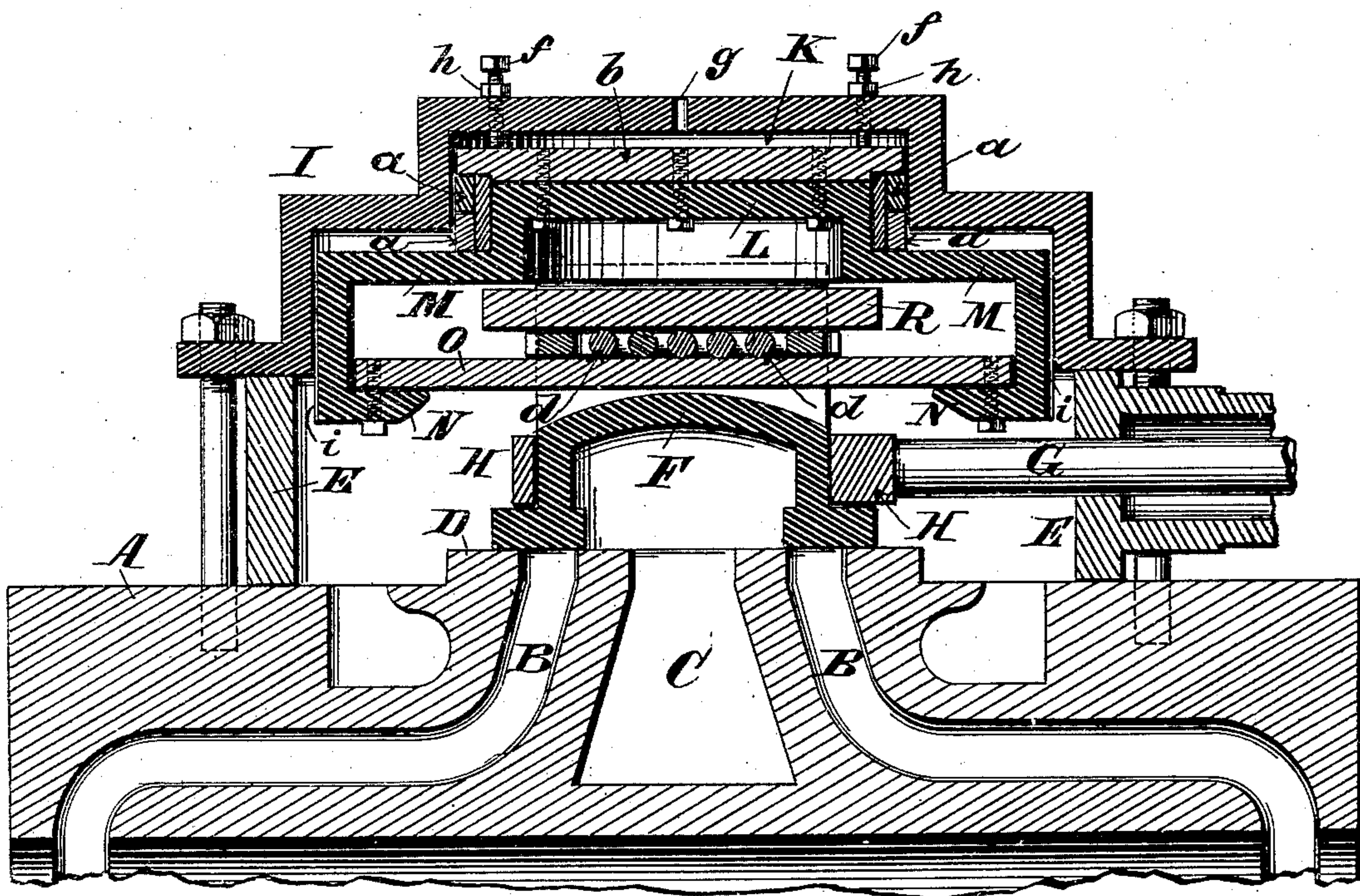
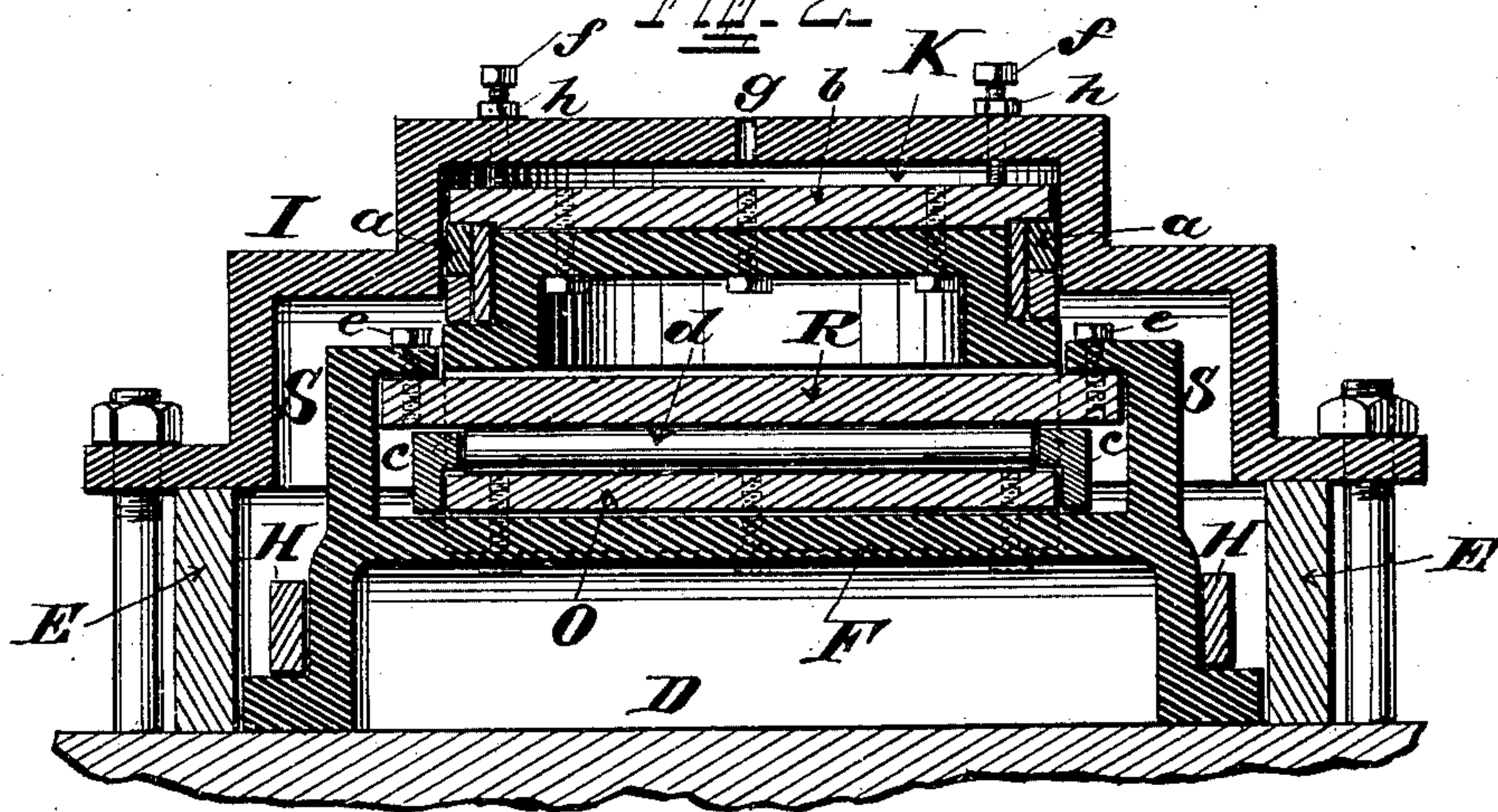


Fig. 2.



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Fig. 3.

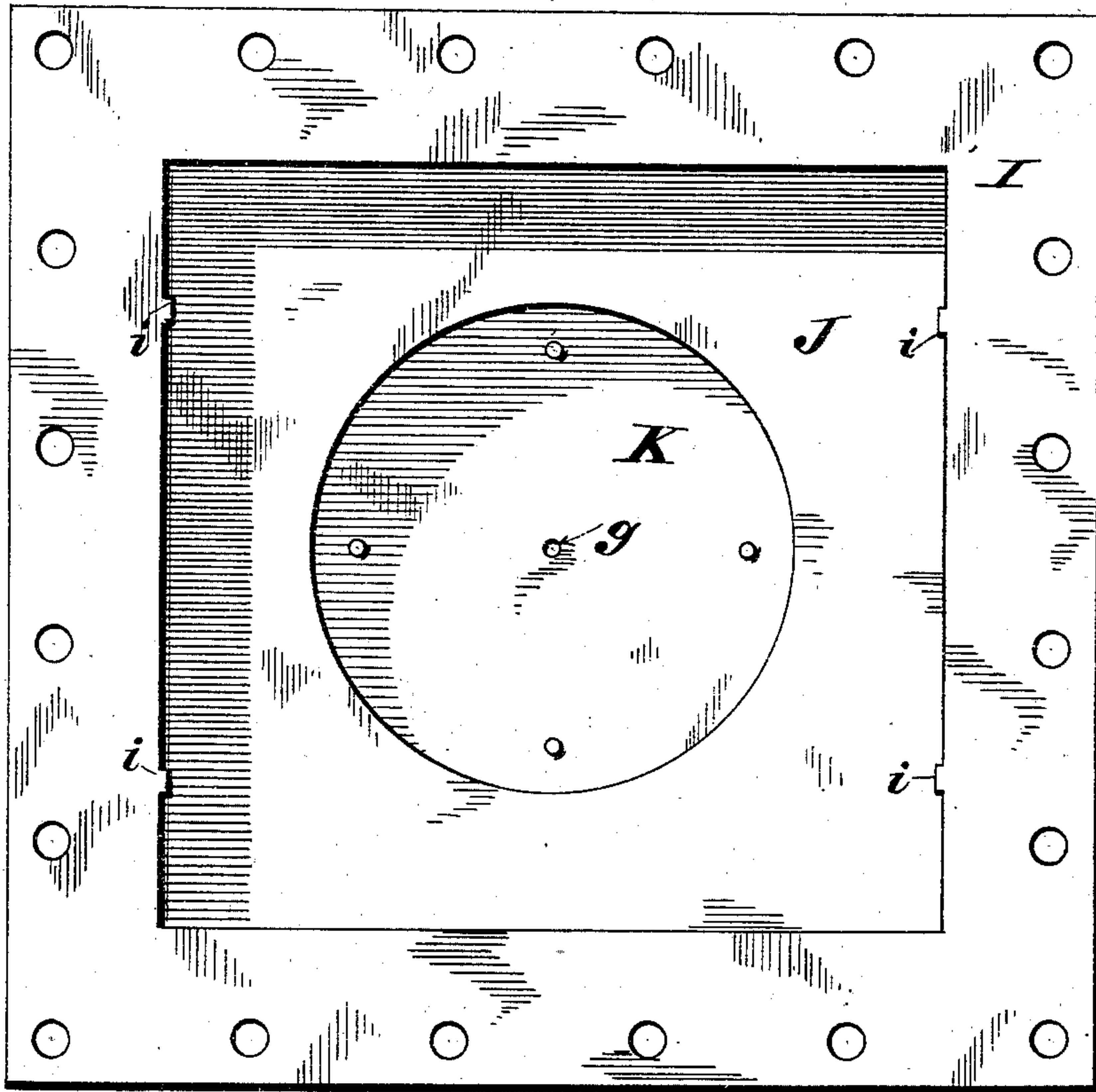


Fig. 4.

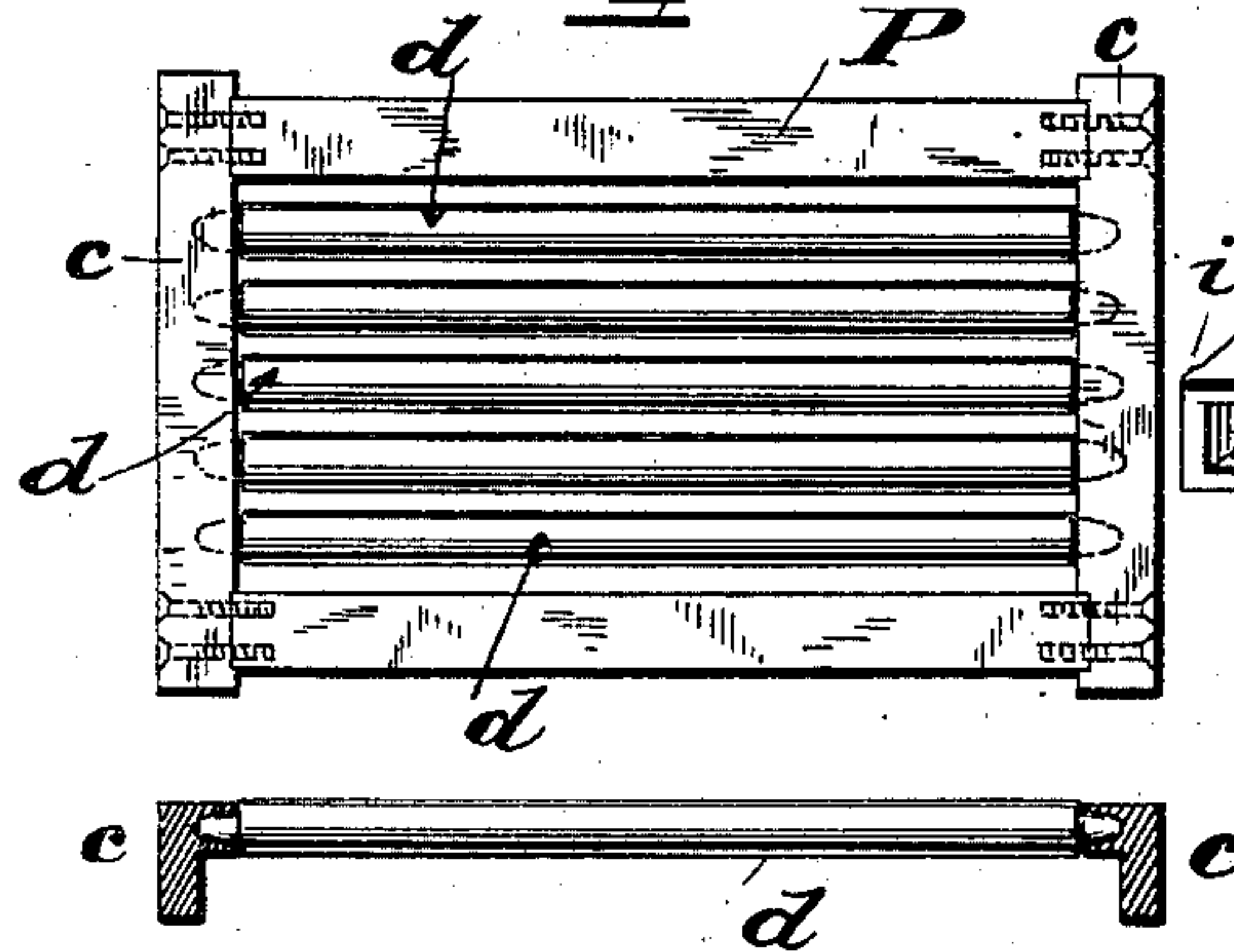
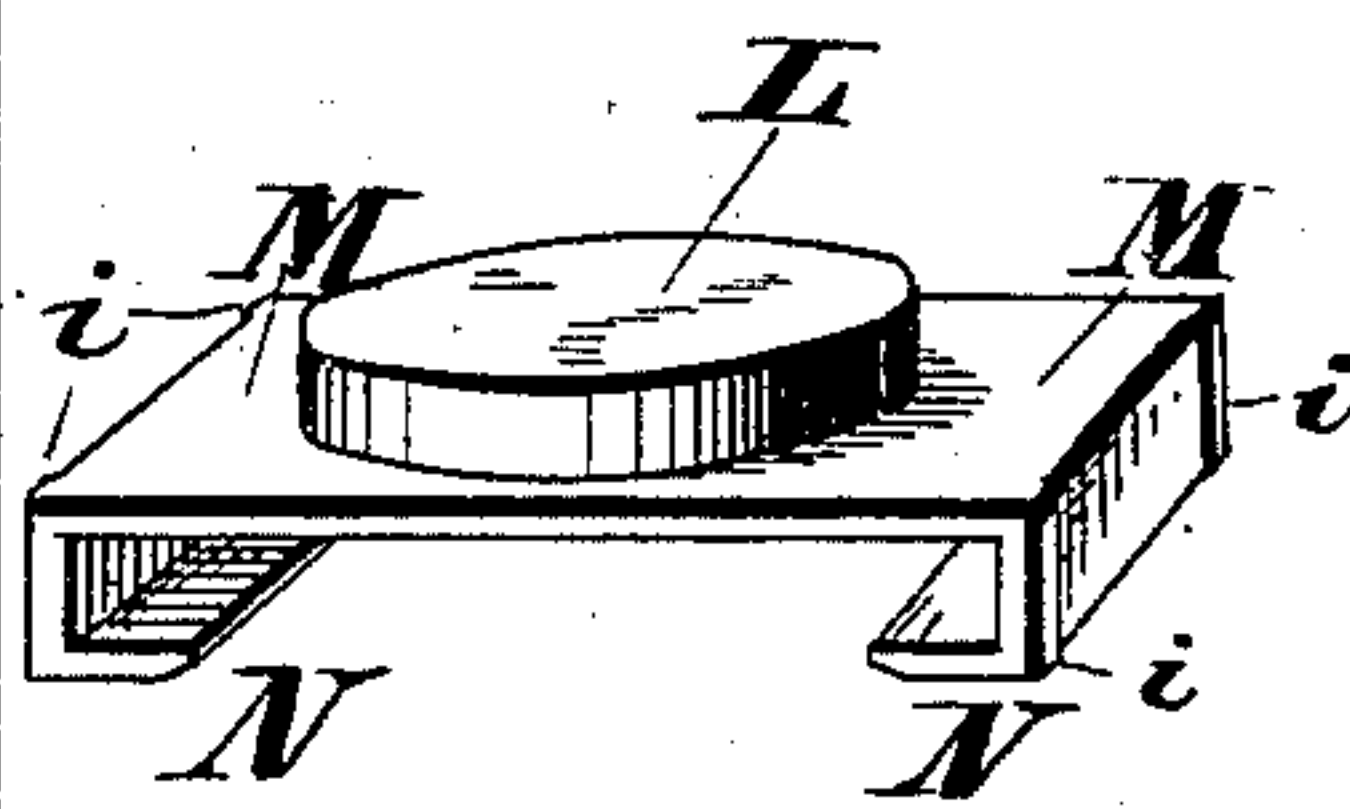


Fig. 5.



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UNITED STATES PATENT OFFICE.

JAMES G. MINER, OF CINCINNATI, OHIO.

BALANCED SLIDE-VALVE.

SPECIFICATION forming part of Letters Patent No. 314,258, dated March 24, 1885.

Application filed November 1, 1884. (No model.)

To all whom it may concern:

Be it known that I, JAMES G. MINER, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, 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 a part of this specification.

My invention relates to that class of balanced slide-valves, preferably for locomotive-engines, in which the valve is supported upon anti-friction rollers, and in which the downward pressure exerted by the steam upon the valve is relieved or counterbalanced by an upward steam-pressure acting upon lifting devices secured to a vertically-movable piston confined and working in a chamber formed in the steam-chest cover.

The object of my invention is to simplify the construction of this class of devices, and to insure the more perfect working and adjustment of the parts; and its novelty consists in the construction, combination, and arrangement of the parts, all as will be here-with set forth and specifically claimed.

In the accompanying drawings, Figure 1, Sheet 1, is a central section in side elevation of the steam-chest, the contained valve and its appliances, and the induction and exhaust ports. Fig. 2, Sheet 1, is a central sectional view in end elevation of the steam-chest, valve, and its appliances. Fig. 3, Sheet 2, is an internal plan view of the steam-chest cover. Fig. 4, Sheet 2, is a plan view of the roller-frame and rollers, the same being shown in sectional end elevation directly below said figure. Fig. 5, Sheet 2, is a diminished perspective view of the vertically-moving piston and its integral yoke-extensions.

The same letters of reference are used to indicate identical parts in all the figures.

I have illustrated herein the well-known form of locomotive steam-chest and D-valve, to which my invention is applied; but I do not thereby wish to be understood as limiting myself to this class of valves only, as my invention is equally applicable to all classes of slide-valves.

In the drawings, A is the upper portion of the main cylinder, containing the usual induc-

tion-ports, B, exhaust C, and valve-seat D, upon which, within the chest E, travels the D-valve F, actuated by its rod G and yoke or link-coupling H.

I is the steam-chest cover, containing a rectangular recess or chamber, J, and a further upper circular piston-chamber, K, as seen more particularly in Fig. 3. This cover, together with the steam-chest, is bolted down in the usual or any suitable manner.

Fitted within the chamber K by means of packing-rings *a*, secured by a follower-head, *b*, is the vertically-traveling piston L, having lateral extensions M and pendent inturned ends N, upon which rests and is bolted the rectangular lifting-plate O. The shape of this piston and its yoke-extensions is clearly shown in Fig. 5.

It will be seen by reference to Fig. 1 that the vertical portions of the yoke-extensions M are provided with chipping-strips *i*, which engage with corresponding chipping-strips or the inner adjacent ends of the walls of the cover itself, whereby a perfect guide is formed to insure absolutely the true vertical working of the piston L. This result could also be obtained by having the adjacent bearing-surfaces of the vertical portions of the yoke-extension M and the chamber J planed true and in contact with or without packings.

Upon the lifting-plate O is fitted a rectangular roller-frame, P, whose side walls, *c*, are rabbeted, so as to overlap and embrace the sides of the lifting-plate, as shown in Fig. 2. This frame has journaled in its side walls a series of rollers, *d*, which rest and travel upon the plate O in the directions of the travel of the valve. By having the side rails of the roller-frame overlapping the sides of the lifting-plate, so as to embrace the same, a true guide is formed, which prevents the roller-frame from binding or from traveling in any other than direct lines.

Resting upon the rollers *d* is a plate, R, which is bolted or otherwise secured to inturned vertical extensions S of the valve F, as seen at *e*, Fig. 2.

From this construction it will be seen that the valve F is supported directly upon the friction-rollers *d*, which latter are carried by the piston L and its attachments in such manner that the pressure of steam downward upon

the valve can be counteracted to any extent desired by the proportioning of the parts and their relative areas by the pressure of the steam upward acting against the piston L, as
5 will be readily understood. The extent of upward travel of the piston L is regulated by set-screws *f*, tapped through the head of the chamber K, and bearing against the follower-head *b*. These screws may have the usual
10 jam-nuts, *h*. I form any suitable vent, *g*, through the head of the chamber K to get rid of any leakage of steam that may take place. It will be observed that the rollers *d* extend almost the entire width of the plate O, there-
15 by preventing unequal wear or channeling, and by making these rollers of such diameters that the shortest stroke of the valve gives them at least one entire revolution they are kept perfectly cylindrical and true.

20 I am aware that valves have been before supported on short friction-rollers, and have been counterbalanced by vertically-actuated pistons; but,

25 Having thus fully described my invention, I claim—

1. The piston L, with yoke-extensions M N, supporting the lifting-plate O, in combination with the slide-valve supported and traveling

on said plate through the medium of the plate R and friction-rollers, substantially as de- 30 scribed.

2. In a balanced slide-valve wherein an upward pressure is exerted upon the valve through the medium of a vertically-acting piston and lifting-plate, the combination, with 35 said lifting-plate and valve, of an interposed roller-frame provided with rollers extending almost the width of said plate, and having its sides overlapping and embracing said plate at its side, whereby said frame and rollers are 40 compelled to travel in true and direct lines, substantially as described.

3. The piston L, with yoke-extensions M N, supporting the lifting-plate O, the vertical 45 portions of said yoke-extensions bearing and traveling upon the adjacent inner end walls of the cover, whereby said piston is caused to travel absolutely true, in combination with the slide-valve supported and traveling on said 50 plate through the medium of friction-rollers, substantially as described.

J. G. MINER.

Witnesses:

ED. W. RECTOR,
OTTO RICHTER.