

(No Model.)

2 Sheets—Sheet 1.

H. R. STICKNEY.
STEAM ENGINE.

No. 455,775.

Patented July 14, 1891.

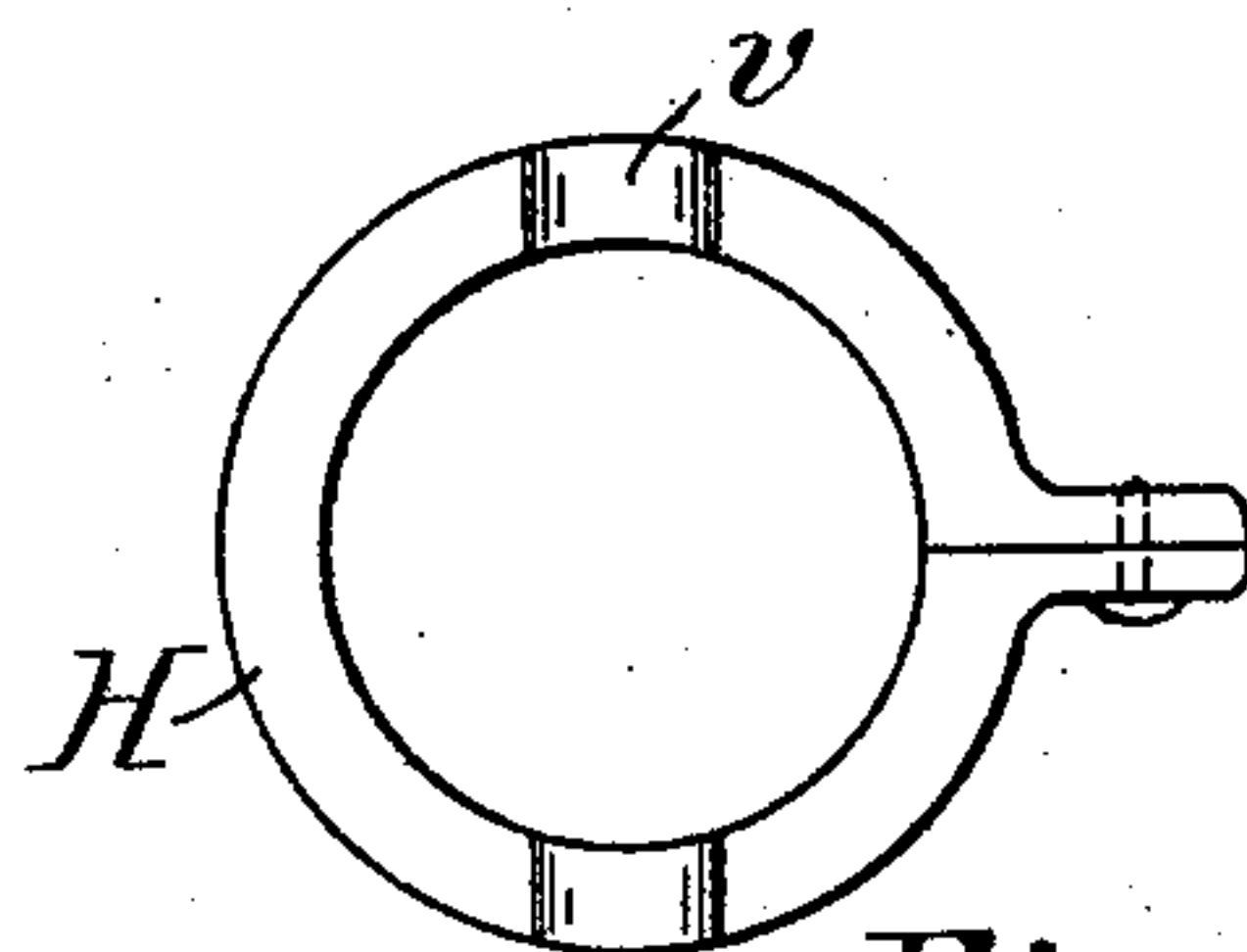
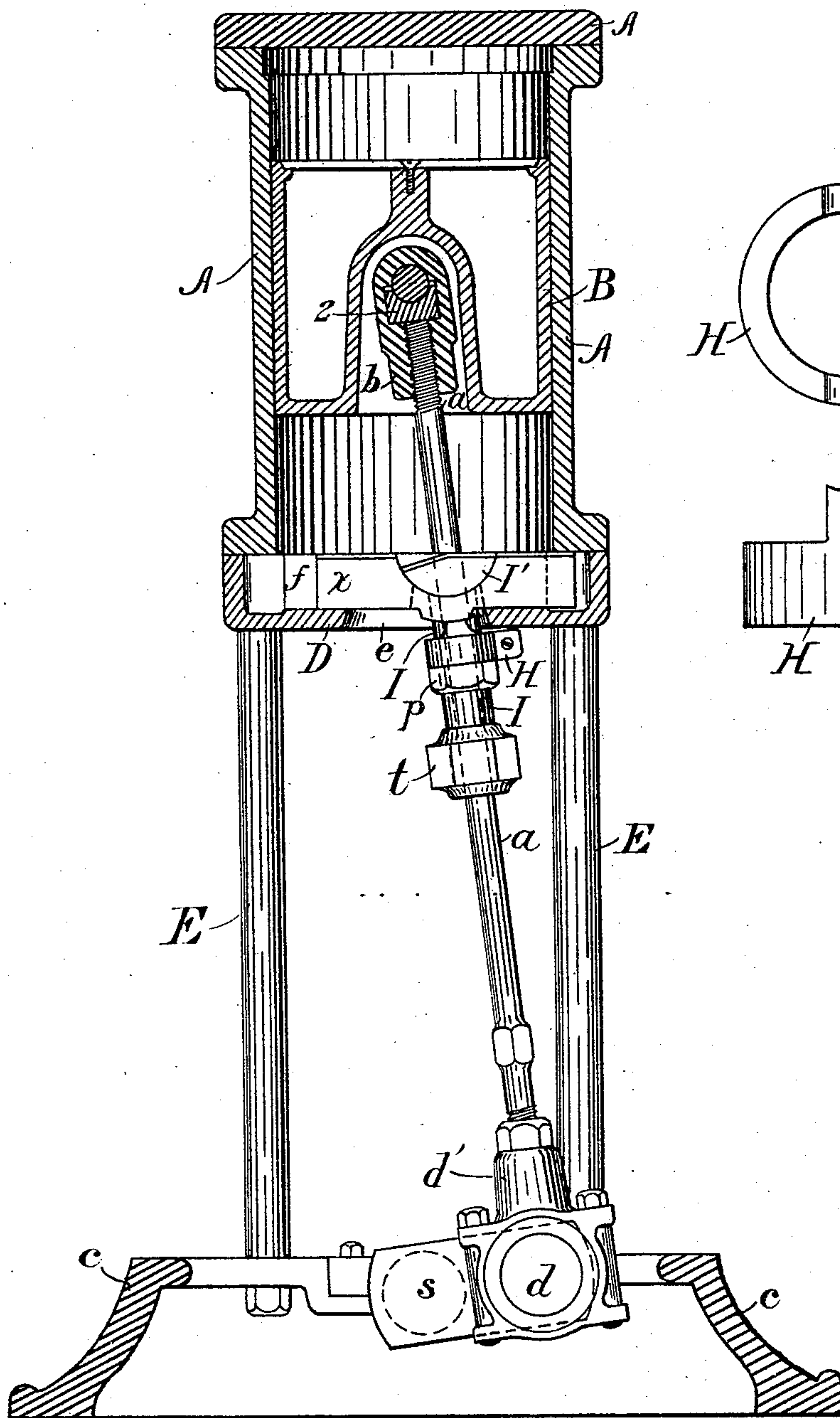


Fig. 2.

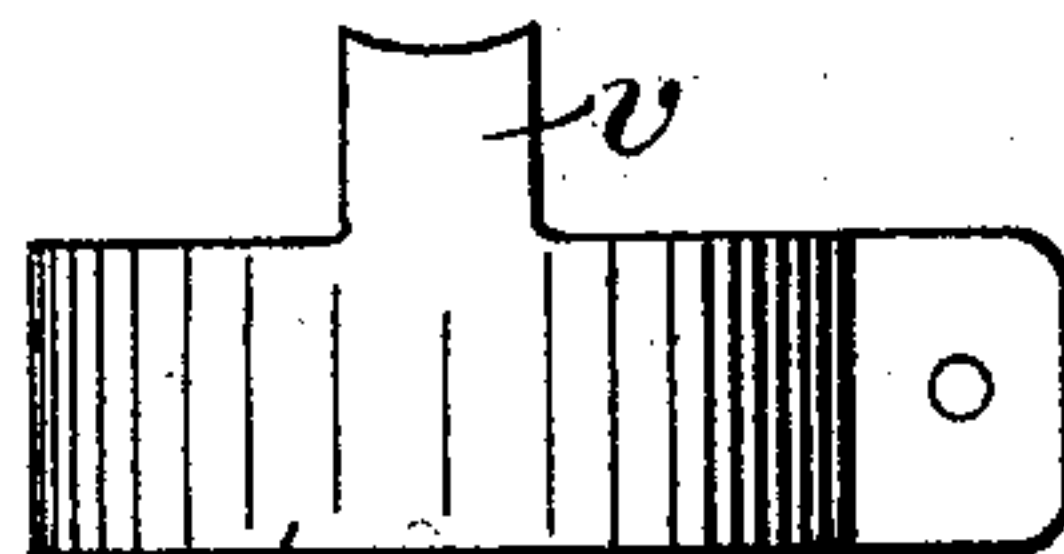


Fig. 3.

Fig. 1.

Witnesses

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Guy Thompson

Inventor

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BY *W. B. Bird* ATTORNEY

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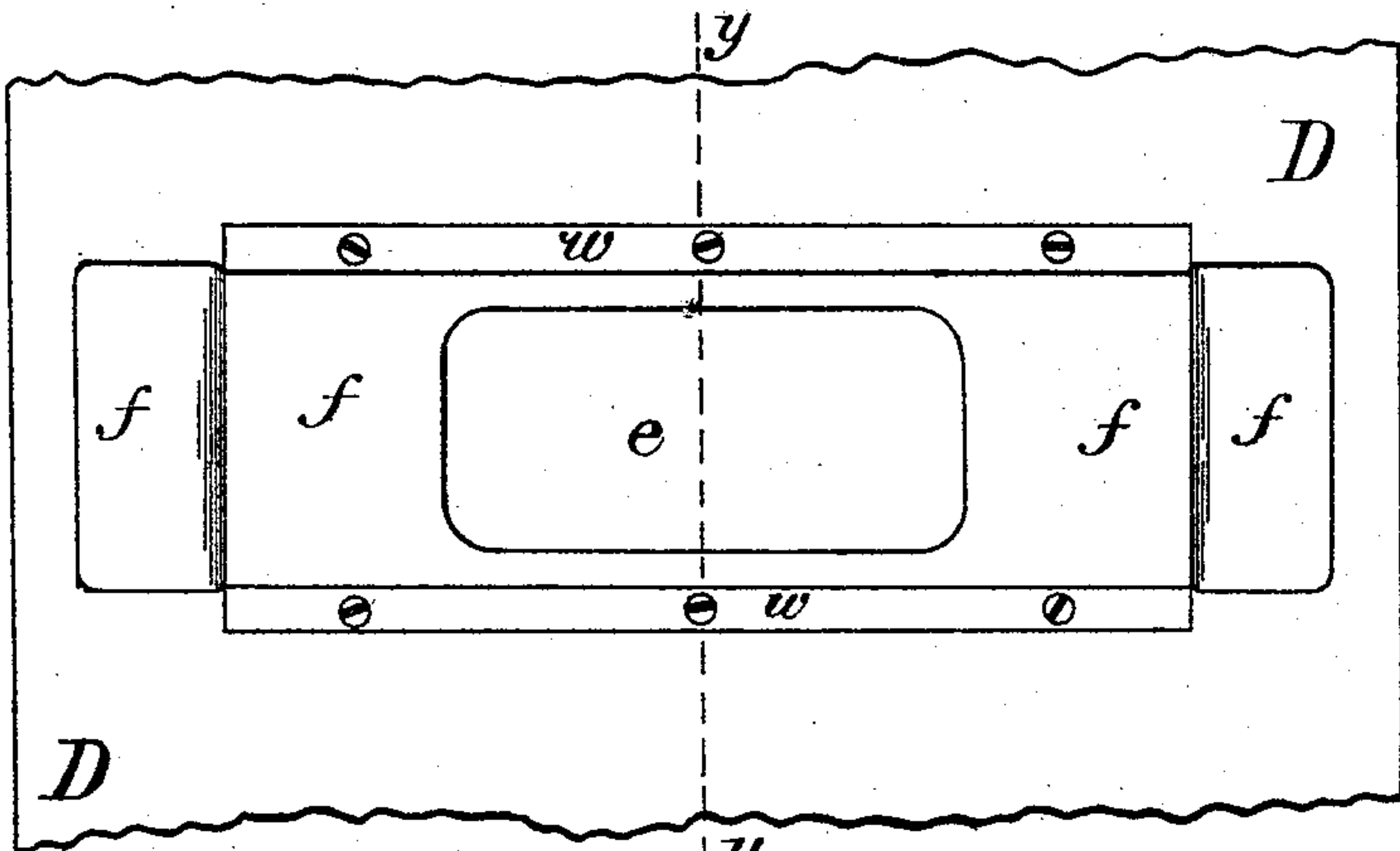


Fig. 4.

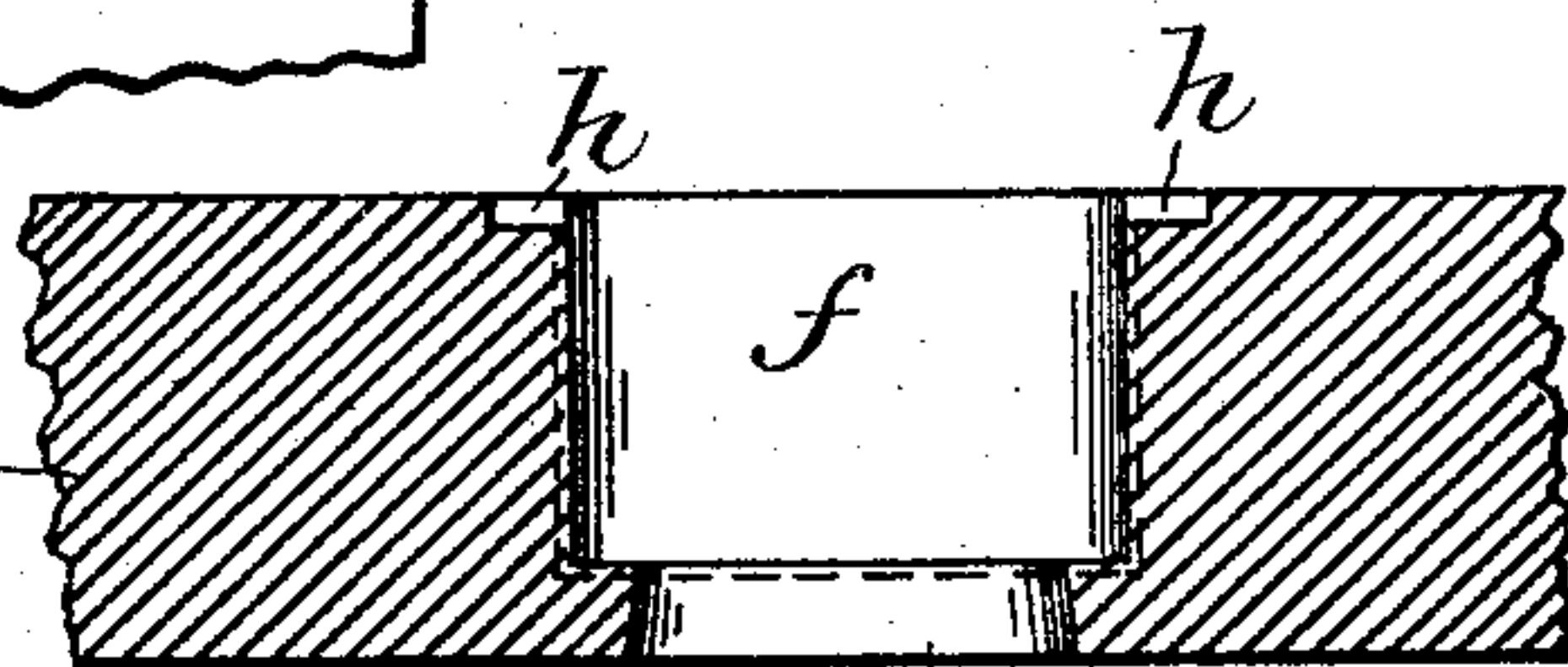


Fig. 5.

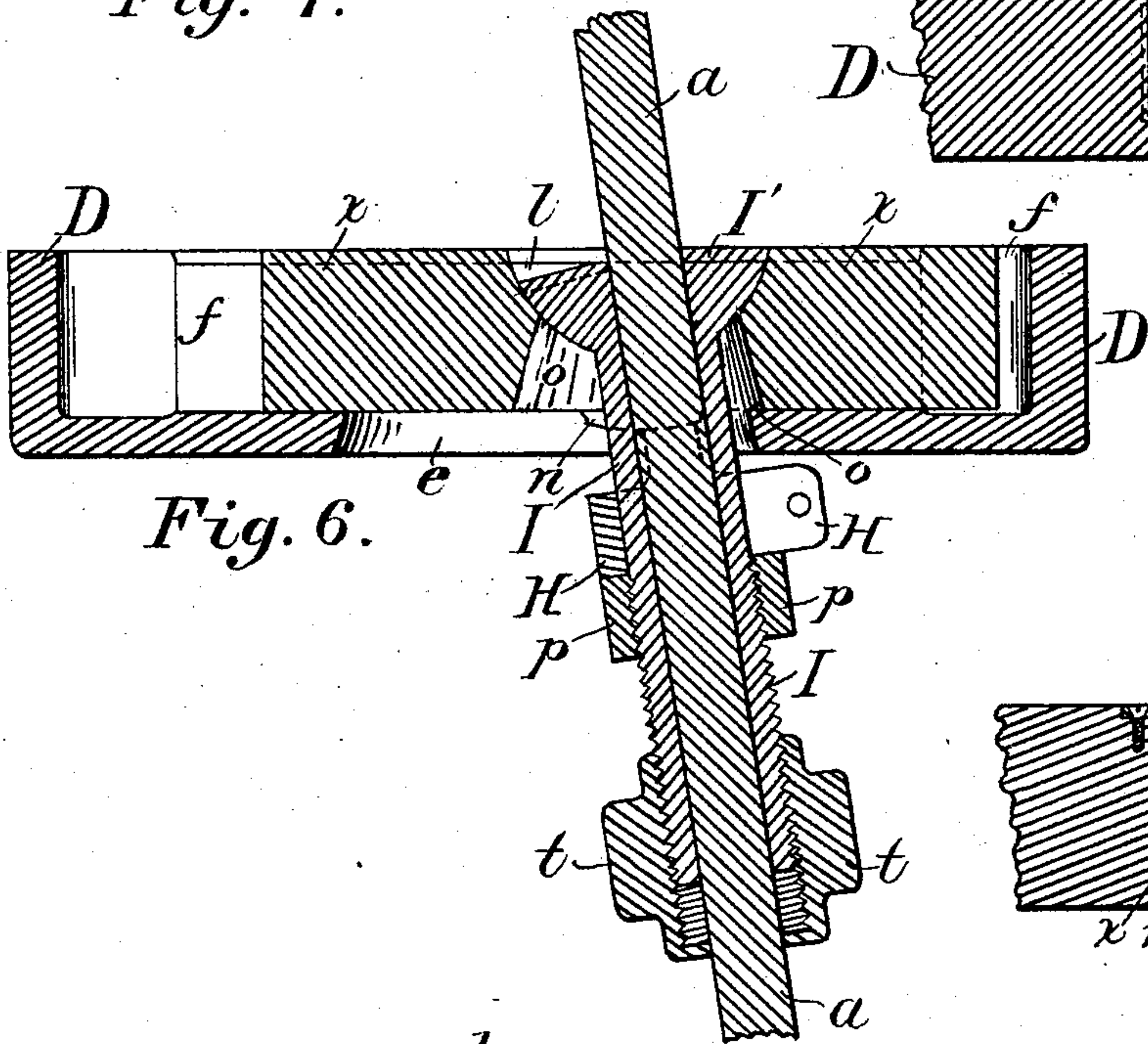


Fig. 6.

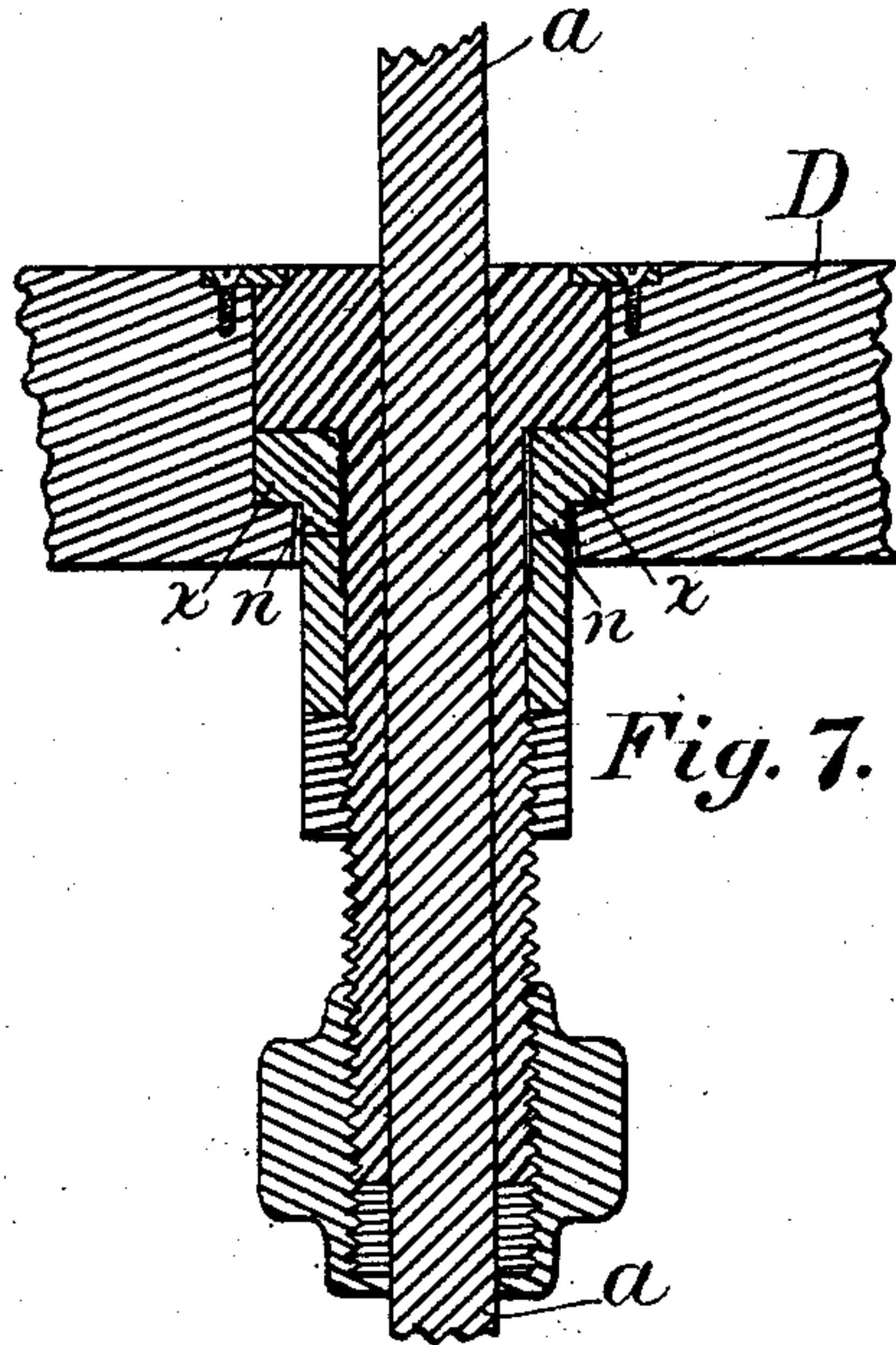


Fig. 7.

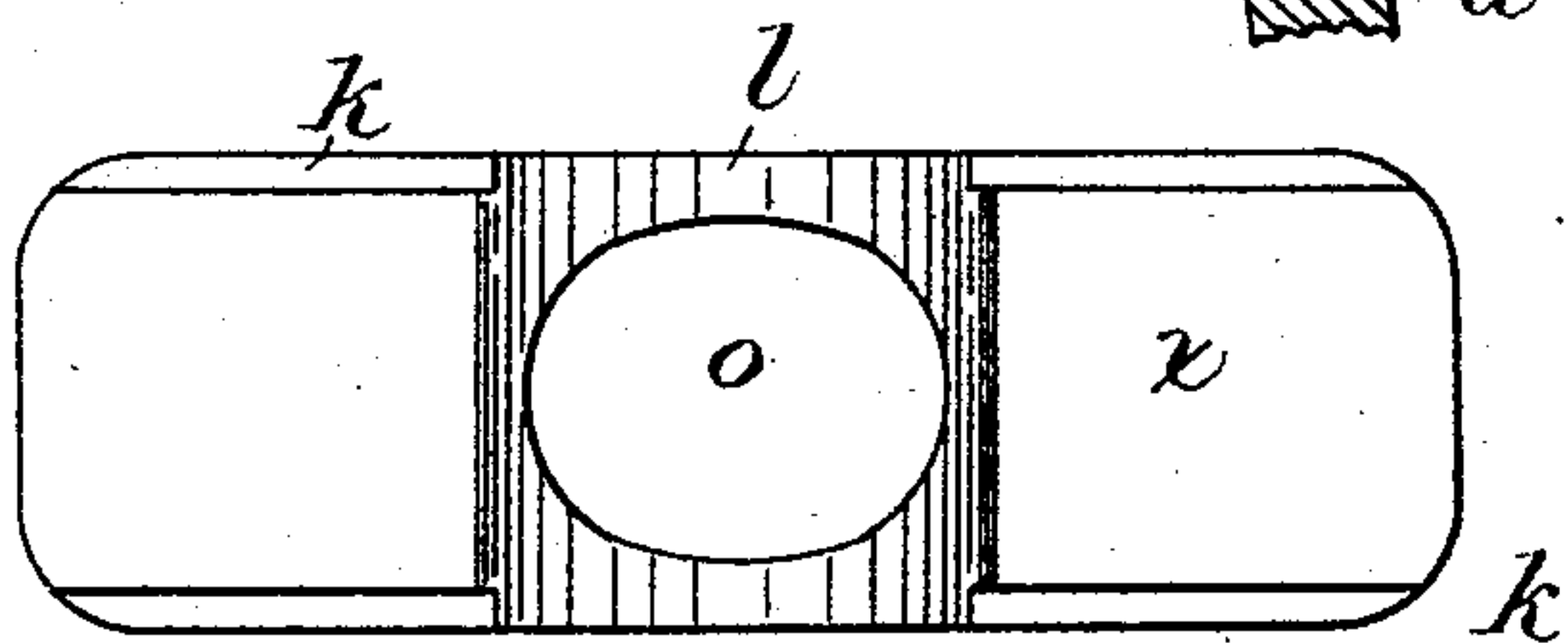


Fig. 8.

Witnesses

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UNITED STATES PATENT OFFICE.

HENRY R. STICKNEY, OF PORTLAND, MAINE, ASSIGNOR OF ONE-HALF TO
RICHARD O. CONANT, OF SAME PLACE.

STEAM-ENGINE.

SPECIFICATION forming part of Letters Patent No. 455,775, dated July 14, 1891.

Application filed February 12, 1891. Serial No. 381,143. (No model.)

To all whom it may concern:

Be it known that I, HENRY R. STICKNEY, a citizen of the United States, residing at Portland, in the county of Cumberland and State of Maine, have invented certain new and useful Improvements in Steam-Engines; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to new and useful improvements in steam-engines of that kind in which the piston-rod, which is directly connected with the crank-pin, is free to oscillate and passes through a slide which slips back and forth in or upon the head of the cylinder and forms a tight joint therewith.

The device in which is embodied my invention is described below with references to the drawings which accompany this specification, and in which—

Figure 1 is a transverse vertical section of the cylinder and piston, showing also the piston-rod and crank. Fig. 2 is a top plan of the sleeve H. Fig. 3 is a side elevation of the same. Fig. 4 is a top plan of the valve-seat in lower cylinder-head. Fig. 5 is a vertical section of the same through the line *y y* of Fig. 4. Fig. 6 is a vertical section of the piston-rod, seat, and slide. Fig. 7 is a vertical section of the same at right angles with the plane of section of Fig. 6. Fig. 8 is a top plan of the slide.

C is the bed containing the crank-shaft and supporting by columns E E or otherwise the cylinder.

The cylinder A is provided with the usual ports and valves for the admission of steam, and is of the ordinary construction, except the lower head D.

B is the piston, having the piston-rod *a*, which is threaded at its upper and lower ends. At the upper end the piston-rod screws into the wrist-pin box *b* against the box 2, while at the lower end it is screwed into the crank-pin box *d'*. The lower head D of the cylinder is somewhat thicker than the upper head. In this head is a rectangular slot *f*, extending to a uniform depth of two-thirds or three-quarters (more or less) of the thickness of the head. The sides are parallel with each other

and equidistant from the plane of the center of the piston-rod. (See Figs. 1 and 5.) This slot is provided at the bottom with an opening *e*, narrower than the slot *f*, whose sides are preferably parallel with those of the slot *f*. The length of this opening is slightly longer than the swing of the piston-rod and sleeve at this point. The upper surface of the cylinder-head D on either side of the slot for nearly its entire length is provided with grooves *h*. (See Fig. 5.) Within the slot *f* is placed the slide *x*, (see Fig. 8,) closely fitting between the sides of the slot, but of a length considerably less than that of the slot. (See Fig. 6.) The top of the slide *x* is flush with the upper surface of the cylinder-head D, and has at either side grooves K K, equal in depth with the grooves *h h*. In the center of the slide is a circular depression or seat *l*, centrally located, in which is the elliptical opening *o*. (See Figs. 6 and 8.) On the bottom of the slide *x* on either side of the opening *o* are parallel projections having a curved under surface, (see Fig. 6,) the curvature being concentric with that of the rocking head I', while their outer surfaces are so located as to be slightly within the sides of the opening *e*.

Surrounding the piston-rod *a* is the sleeve I, having at the top the rocking head I', which closely fits the depression or seat *l* in the slide *x*. The sleeve extends a considerable distance below the piston-head, and its exterior surface is threaded for about half its lower length. (See Figs. 6 and 7.) The lower end of the sleeve is provided with a packing-box *t*, while shortly above it is the sleeve H, having the shoulders *v v*, the upper surfaces of which have the same curve as the projections *n n*. The sleeve H is held in position, with the shoulders *v v* against the projections *n n* by the nut *p*. The slide *x* is held in position by the guides *w*. (See Figs. 4 and 7.)

The operation of the engine is as simple as its construction. By means of the slide in the lower piston-head and the sleeve surrounding the piston-rod the lower part of the cylinder can be utilized and steam admitted above and below the piston, although the piston-rod swings or oscillates. The slide, which is carried from side to side of the piston-head

D with each stroke of the piston, effectually closes the opening *e* in which the piston swings, the sleeve about the piston, with its circular head, as effectually closing the opening *o* in the slide. The joint between the head of the sleeve *I'* and the seat *l* is kept tight by the pressure of the shouldered sleeve *H*, which may be adjusted by means of the nut *p*.

10 The wearing of the wrist-pin box may be compensated for without removing any of the parts of the engine by turning up the piston-rod *a* against the box *z*.

What I claim is—

15 The combination, with the head of a steam-cylinder through which the piston-rod works,

of a slide reciprocating in a slot in said head and a sleeve having a rocking head resting in a concave seat in said slide and held in place, together with said slide, by suitable guides, said sleeve being provided with a packing-box at the lower end and having an outer sleeve supported by the nut *p*, with shoulders engaging said rocking head, substantially as described. 20 25

In testimony that I claim the foregoing as my invention I have hereunto set my hand this 10th day of February, A. D. 1891.

HENRY R. STICKNEY.

In presence of—

GEO. E. BIRD,

C. R. DUFFETT.