

(No Model.)

2 Sheets—Sheet 1.

F. M. LEAVITT.  
TILTING FRAME POWER PRESS.

No. 451,223.

Patented Apr. 28, 1891.

FIG. 1.

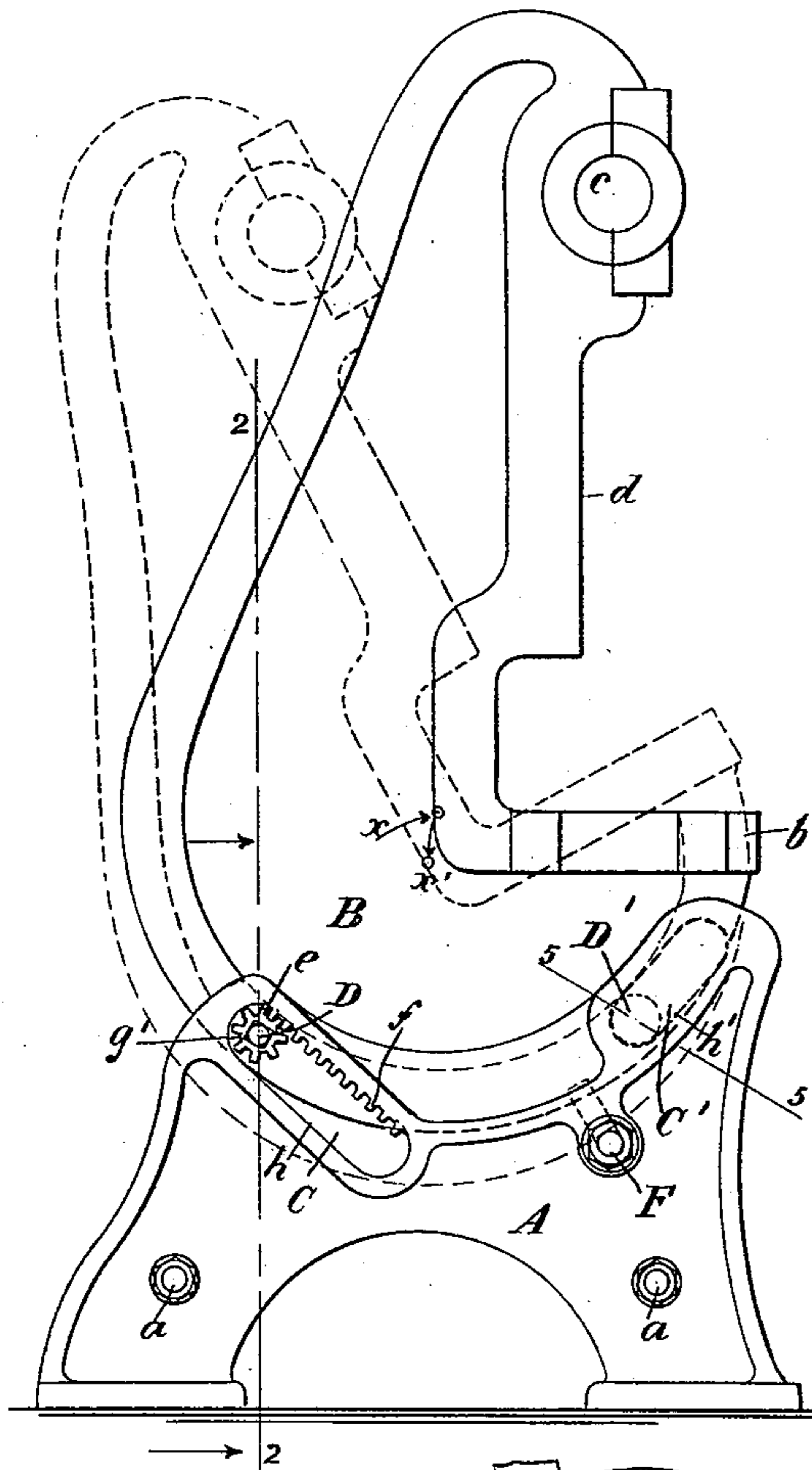


FIG. 2.

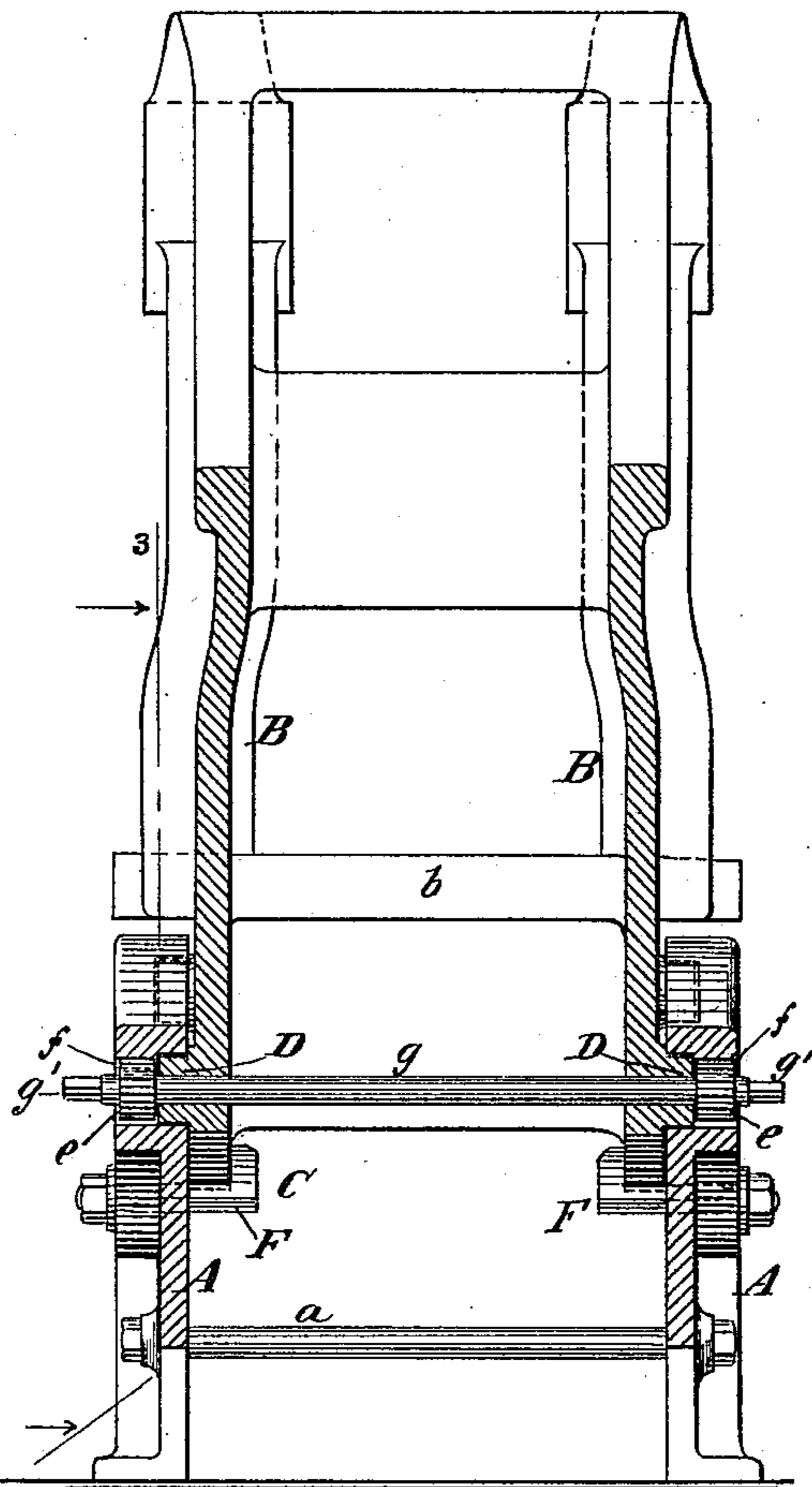
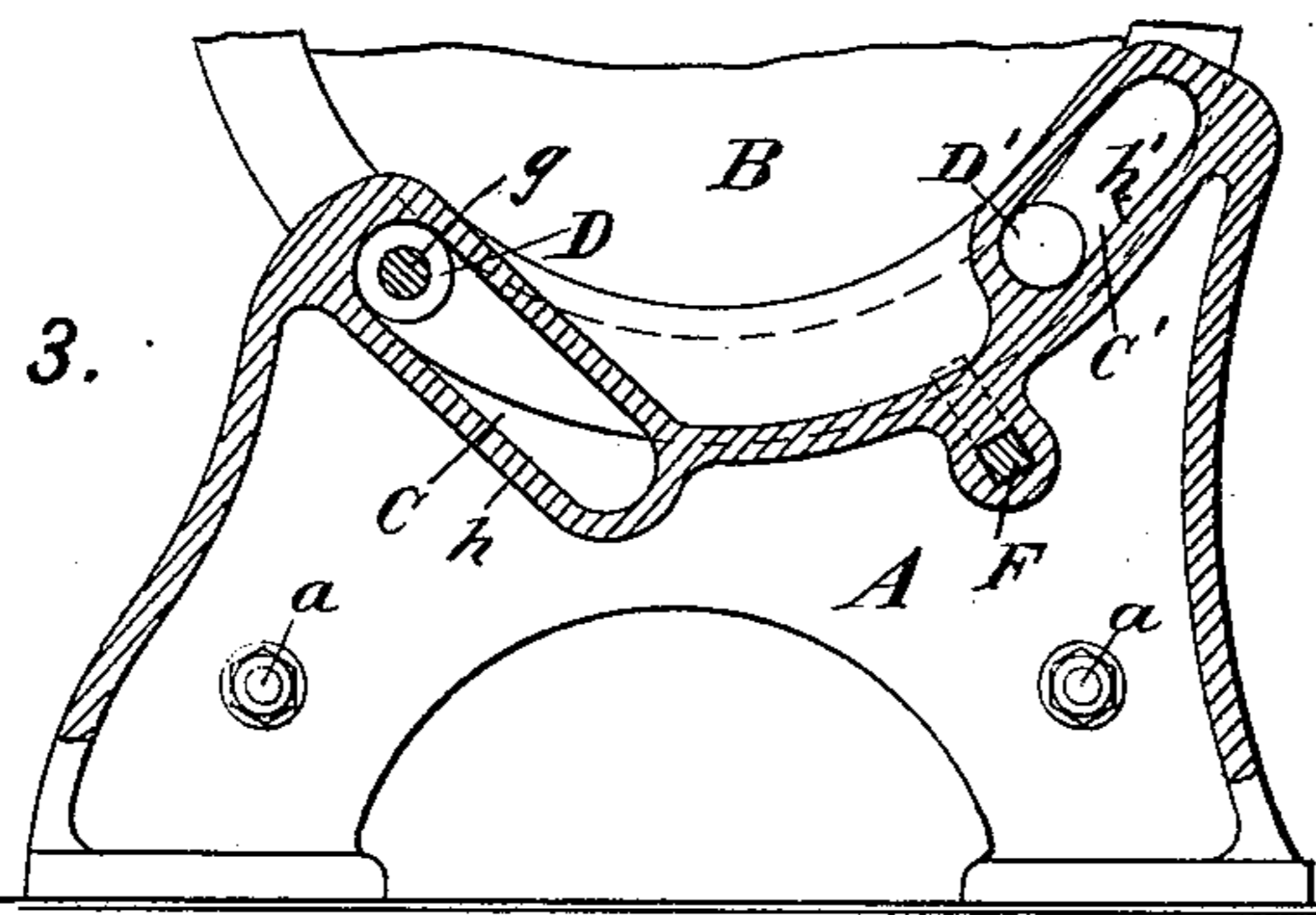


FIG. 3.



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*Fred White*

INVENTOR:

*Frank M. Leavitt,*

By his Attorneys,

*Arthur C. Frazer & Co.,*

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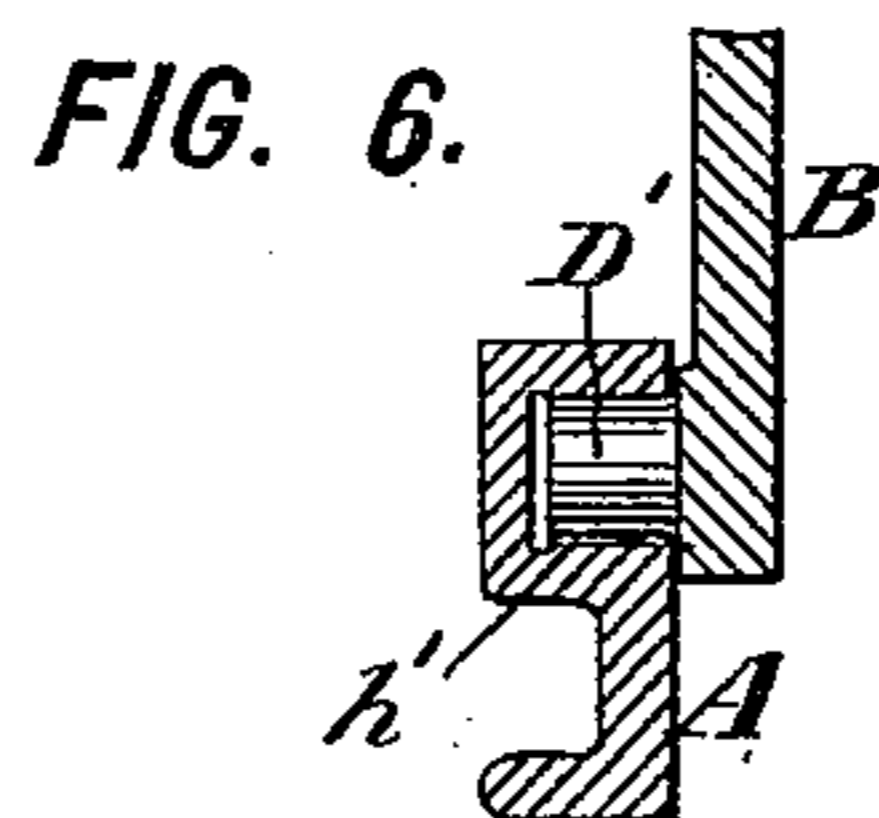
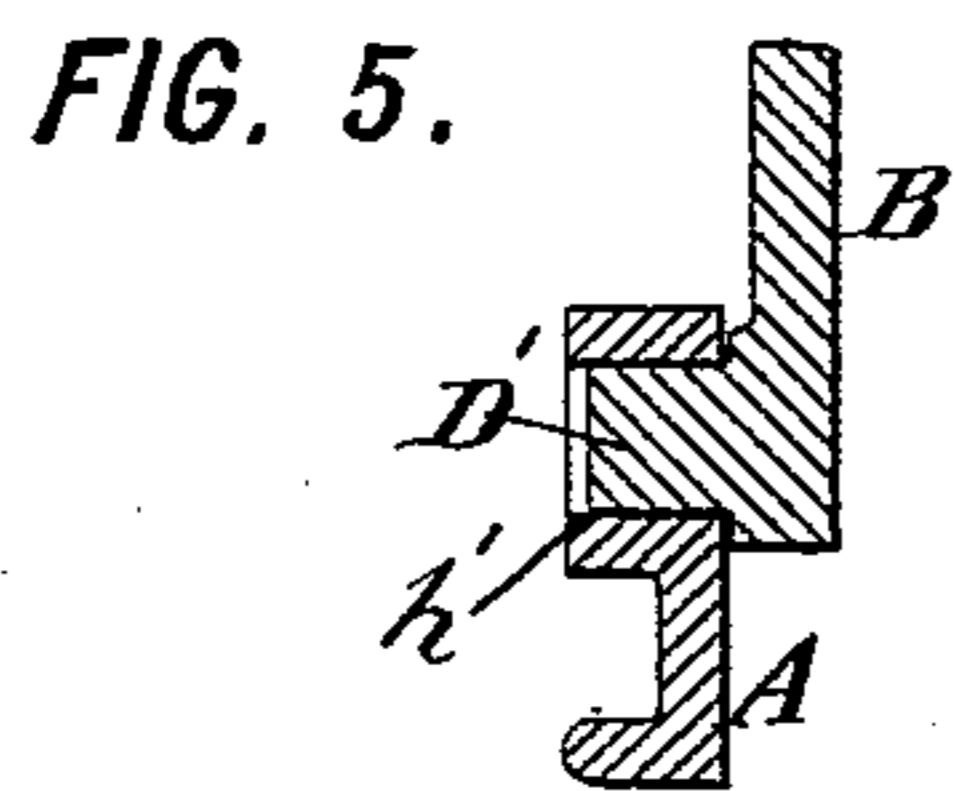
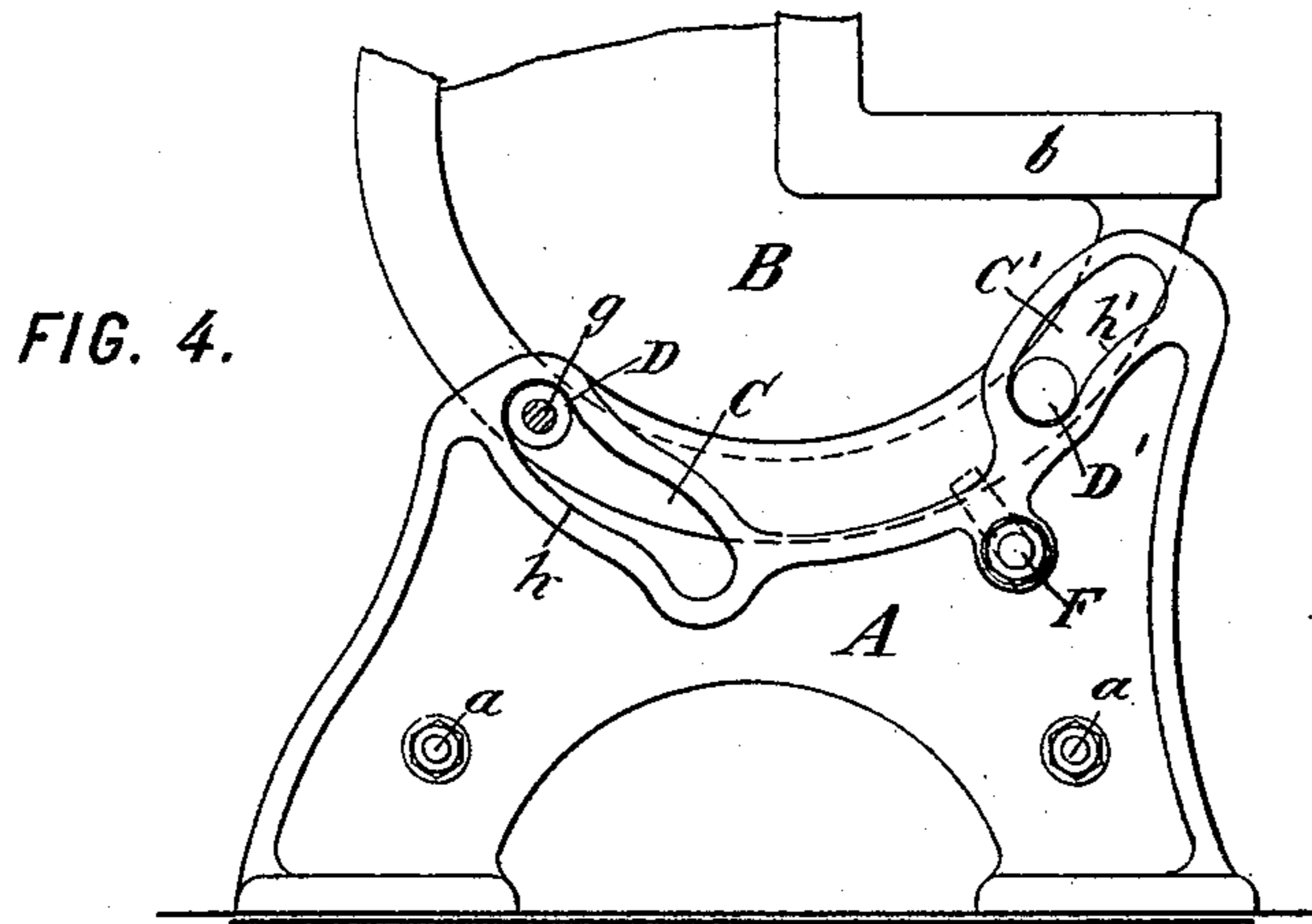
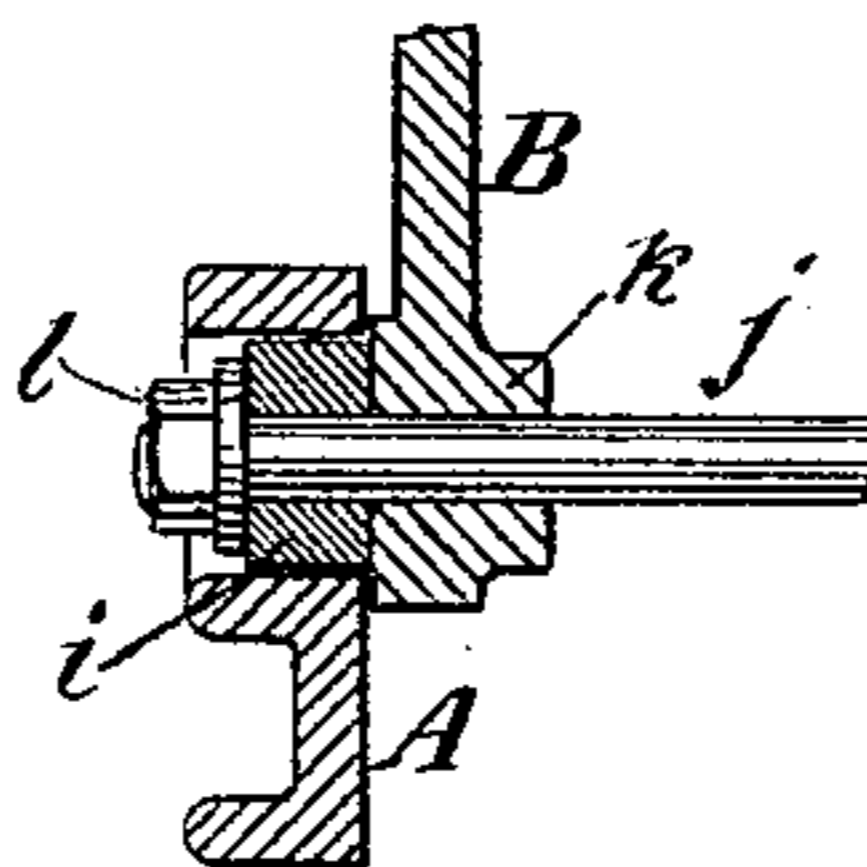


FIG. 7.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

FRANK M. LEAVITT, OF BROOKLYN, NEW YORK.

## TILTING-FRAME POWER-PRESS.

SPECIFICATION forming part of Letters Patent No. 451,223, dated April 28, 1891.

Application filed September 1, 1890. Serial No. 363,650. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK M. LEAVITT, a citizen of the United States, residing in Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Tilting-Frame Power-Presses, of which the following is a specification.

This invention relates to power-presses for punching, stamping, or shaping sheet metal, and for performing other operations of the class known as "tilting-frame" or "adjustable" presses. For certain purposes it is desirable that a power-press should have its head working vertically and its table horizontal, while for other purposes it is desirable that the press should be tilted backwardly in order that the table may be inclined sufficiently to cause the work to slide off backwardly and avoid the necessity of feeding or picking off the finished work. The so-called "adjustable" presses are made with that portion of the frame which carries the bed or die and working parts so constructed as to be adjustable to either an upright or a backwardly-inclined position relatively to the fixed base supporting it. Adjustable or tilting-frame presses have been made with an upper or tilting frame hung on trunnions at opposite sides. They have also been made with the upper or tilting frame and the lower frame or base conformed to each other in a curve and overlapping, being fastened together by passing bolts through coinciding holes. They have also been made with these frames conformed to each other, the upper frame formed with convex arc-shaped bearing-faces resting on concave faces on the lower frame, so that the adjustment is effected by sliding the one bearing-face against the other and then fastening with clamps.

My invention provides an improved construction, which I believe possesses features of superiority over any of the other constructions heretofore used.

According to my invention I construct the lower frame or base with inclined bearing-surfaces sloping toward a point between and beneath them and either straight or curved, and the upper or tilting frame I provide with bearing projections resting on said inclines

and movable along them in the act of tilting the frame. The bearing-surfaces are formed, preferably, by the lower sides of slots in the lower or base frame, and a rack is provided in connection with one of the slots engaged by a pinion in connection with one of the movable projections, so that by turning the pinion the projection is caused to travel through the slot, and the frame is thereby tilted from one position to the other.

Figure 1 of the accompanying drawings is a side elevation of my improved press, showing the frame in the upright position in full lines and in the tilted position in dotted lines. Fig. 2 is a rear elevation thereof, one side being partly in section in the plane of the line 2 2 in Fig. 1. Fig. 3 is a fragmentary side elevation answering to Fig. 1, except that the base-frame is partly in section in the plane of the line 3 3 in Fig. 2. Fig. 4 is a similar view to Fig. 3, but showing a modification. Fig. 5 is a transverse section in the plane of the line 5 5 in Fig. 1. Fig. 6 is a modification of Fig. 5. Fig. 7 is a further modification thereof.

Let A designate the lower frame or base, and B the upper or tilting frame. The base A consists in general of two plates arranged vertically and parallel to each other on opposite sides of the press, and connected together by tie-rods *a a* or by other intermediate connections, as usual. The tilting frame is made also by preference of two upright plates arranged, however, somewhat closer together than those of the base A, so as to pass between them, and connected together by transverse ties, the plates and ties being preferably cast in one piece in the manufacture of small presses. A table or bed *b* is carried by the frame B, being preferably cast in one piece therewith. This frame has bearings *c* at its upper end for the driving or crank shaft of the press, and the guiding slideways for the sliding head are fastened to the straight front *d* thereof, all as usual. The working parts of the press are not shown in the drawings, these being well understood and not being modified by my invention. The lower portion of the tilting frame B is swelled in a curve of approximately a half-circle, as is usual in presses of this character.

The base A is formed at each side with two

inclined slots C and C', (best shown in Fig. 3,) and the lower part of the tilting frame B, which projects between the upper or slotted portions of the base, has at each side two projections D and D', which enter these slots and constitute the attachment by which the tilting frame is connected to and supported by the base. The slots slope downwardly toward the middle and are preferably straight, although they might be curved either with the curves shown in Fig. 4 or with other suitable curves. When the press is used as an upright press, the projections D and D' are at the rear ends of the slots C and C', which accordingly constitute stops to prevent any further movement of the tilting frame in the direction in which it is moved to bring it to the vertical position. When the frame is tilted back to the position shown in dotted lines, the projections slide through the slots to their opposite ends and are stopped thereby; thus preventing any further movement of the frame in the backward direction. In either position the tilting frame is made fast to the base by any suitable means known to the mechanical arts, one of the most convenient being by a screw-clamp or hooked bolt of the construction shown at F in Fig. 2, by screwing which up the tilting frame and base are drawn or clamped firmly together.

In order to provide a convenient means for shifting the tilting frame between its extreme positions, I provide a rack and pinion, the rack *f* being arranged at and parallel with, or preferably in a lateral extension of, the slot, which is widened for this purpose, one of the slots, preferably the slot C, and the pinion *e* being arranged against the end of the projection D on a shaft *g*, which passes through from one side of the base to the other, and has its end *g'* squared for the reception of a key by which to turn it. A similar rack *f* and pinion *e* are provided at the other side of the base, both the pinions *e* being acted upon by the shaft *g*, so that as this shaft is turned the propulsive force is applied alike on both sides of the frame by the engagement of both pinions with their racks. The turning of the pinions causes the projections D D' to travel or slide in the slot C, by which means the frame B is tilted in one direction or the other, its projections D' meanwhile sliding in the slot C'. The rack *f* may be cast integrally with the base A or it may be a separate rack fastened to the base.

The essential portions of the slots C C' are the lower sides thereof, the surfaces *h h'* of which constitute the bearing inclines upon which the projections D D' rest. By constructing the frame B so that in either position its center of gravity shall be between the two projections D D' neither of these projections would have any upward thrust, and the metal extending over the slots might be removed. The construction shown, however, is preferable, as it prevents any possible displacement of the tilting frame during its adjustment.

The relative angles of inclination of the two slots are such that the bearing-frame will stand in either position of itself, the friction of the projections against the surfaces of the slots being sufficient to prevent any spontaneous movement. These angles are also so relatively proportioned that the frame B in tilting back instead of turning concentrically around the center *x* of its swelled lower part, as with presses of this character heretofore made, falls lower so as to bring its center to the position shown at *x'*. This movement, which cannot be attained with the pivotal connections between the tilting frame and base heretofore used, is attended with the advantage that the bed *b* is not thrown so high in front by the tilting backward of the frame. It is no longer necessary that the bed shall be either too high when the press is tilted back or too low when it is tilted forward, as has been heretofore unavoidable.

Figs. 5, 6, and 7 are sections through the slot C' and projection D', showing three different constructions. In Fig. 5 the slot is open, and the projection, which is here formed of a circular boss cast integrally with the frame B, projects nearly or quite through the slot. In Fig. 6 the slot is closed on the outer side. In Fig. 7 the projection is not integral with the frame B, nor is it a stationary projection. It consists of a hardened roller *i*, turning on a shaft *j*, which passes through the frame B, the latter being preferably formed with a bearing-boss *k*. The shaft may be merely a stud, or it may extend clear across the frame and carry a like roller *i* at its opposite end. Both rollers might be fixed on the shaft and the shaft made to turn in the bearing-boss *k*, or the shaft might be immovably fixed in the bearing-boss and the roller be free to turn on the shaft. The roller is fastened in place on the shaft by a washer and a nut *l*, screwed on the threaded end of the shaft.

I claim as my invention the following defined novel features, substantially as hereinbefore specified, namely:

1. The combination of a stationary base formed with bearing-inclines with a tilting frame carrying the working parts of the press and having bearing projections resting on said inclines, and means for fastening the tilting frame to the base in different angular positions.

2. The combination of a stationary base formed with inclined bearing-surfaces sloping in opposite directions with a tilting frame carrying the working parts of the press and having bearing projections resting on said bearing-surfaces.

3. The combination of a stationary base formed with inclined slots to constitute bearing-surfaces with a tilting frame carrying the working parts of the press and having projections entering said slots and movable therein to bring the frame to different angular positions.

4. The combination of a stationary base

formed with inclined slots to constitute bearing-surfaces with a tilting frame carrying the working parts of the press and having projections entering said slots and movable  
5 therein to bring the frame to different angular positions, a rack fixed to the base parallel to one of the slots, and a pinion carried by the frame and engaging said rack to propel  
10 the frame between its extreme angular positions.

5. The combination of a stationary base formed with inclined slots to constitute bearing-surfaces with a tilting frame carrying the working parts of the press and having pro-  
15 jections entering said slots and movable therein to bring the frame to different angular positions, a shaft passing through two projections on opposite sides, pinions carried by said shaft at opposite sides of the frame,  
20 and racks fixed to opposite sides of the base parallel to one of the slots thereof and engaged by said pinions.

6. The combination of a stationary base formed with bearing-inclines with a tilting frame formed with a table and carrying the  
25 working parts of the press and having bearing projections resting on said inclines, and said inclines arranged relatively to one another and to the relative positions of said  
30 projections, so that when the projections rest at one end of the respective inclines the bearing-frame shall stand vertically and when the projections are moved to the opposite ends of  
35 the inclines the bearing-frame shall be both tilted back angularly and lowered bodily, substantially in the manner described.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

FRANK M. LEAVITT.

Witnesses:

GEORGE H. FRASEP,  
FRED WHITE.