

No. 840,837.

PATENTED JAN. 8, 1907.

C. N. FREY.

BRAKE.

APPLICATION FILED JULY 23, 1906.

3 SHEETS—SHEET 1.

Fig. 1.

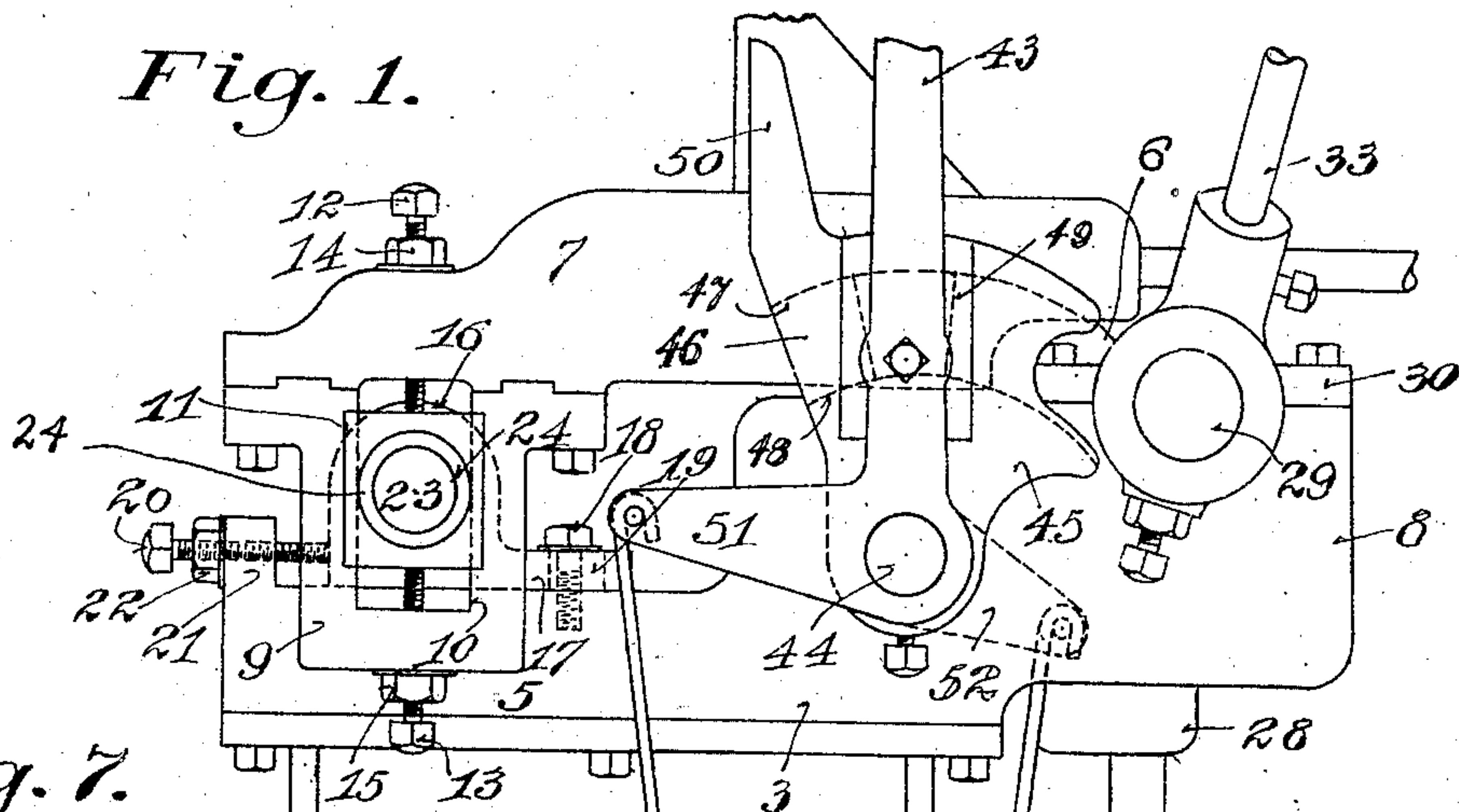
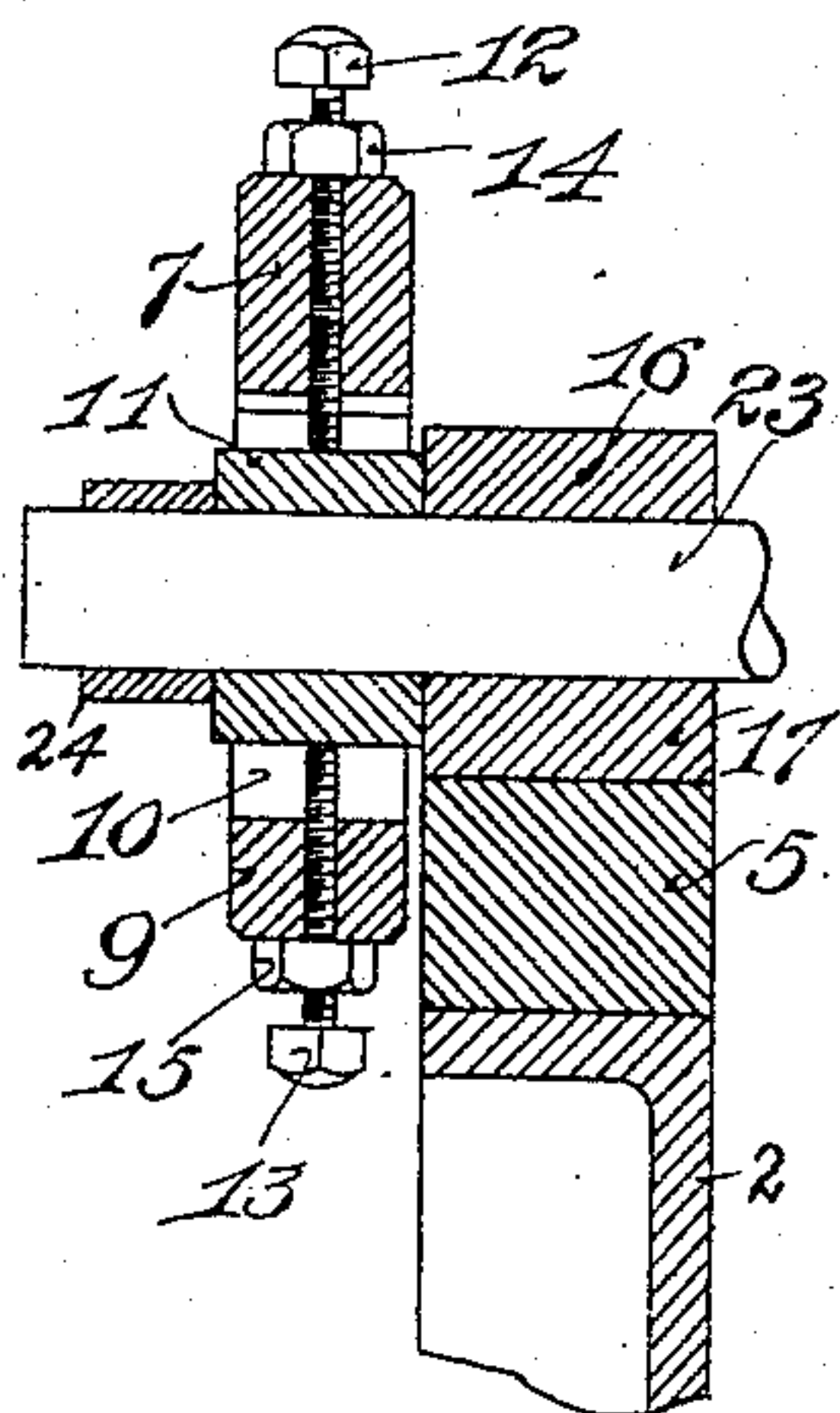


Fig. 7.



Witnesses.

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3 SHEETS—SHEET 2.

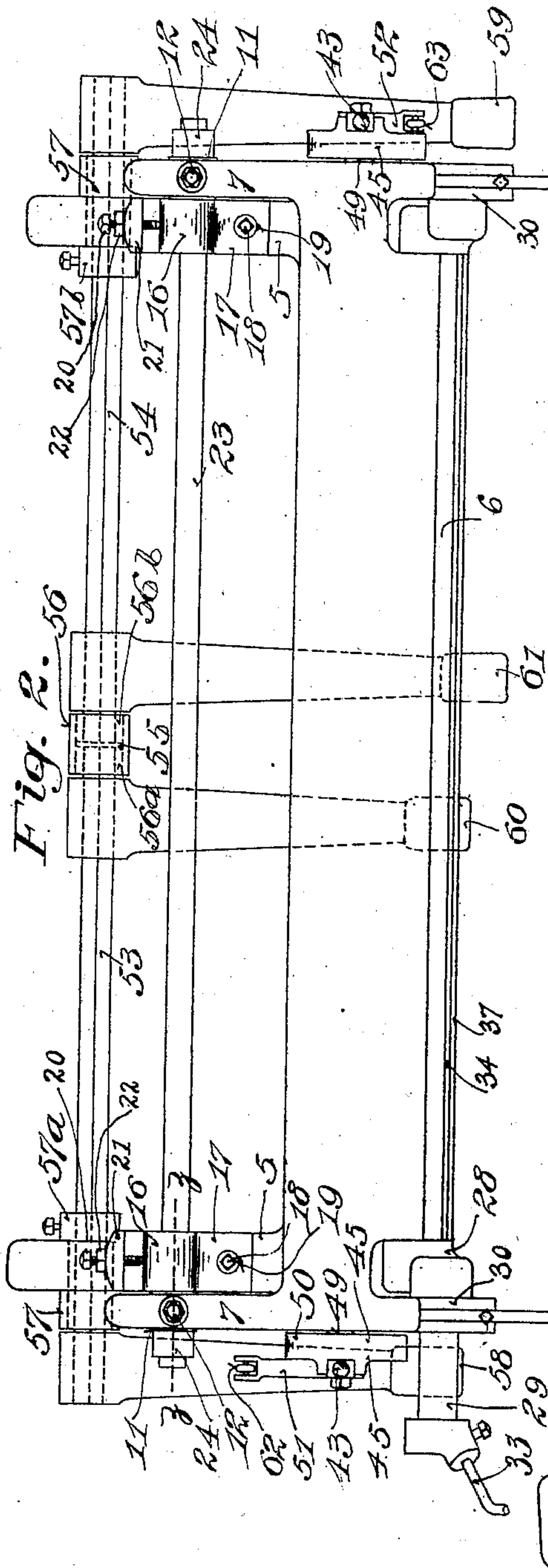
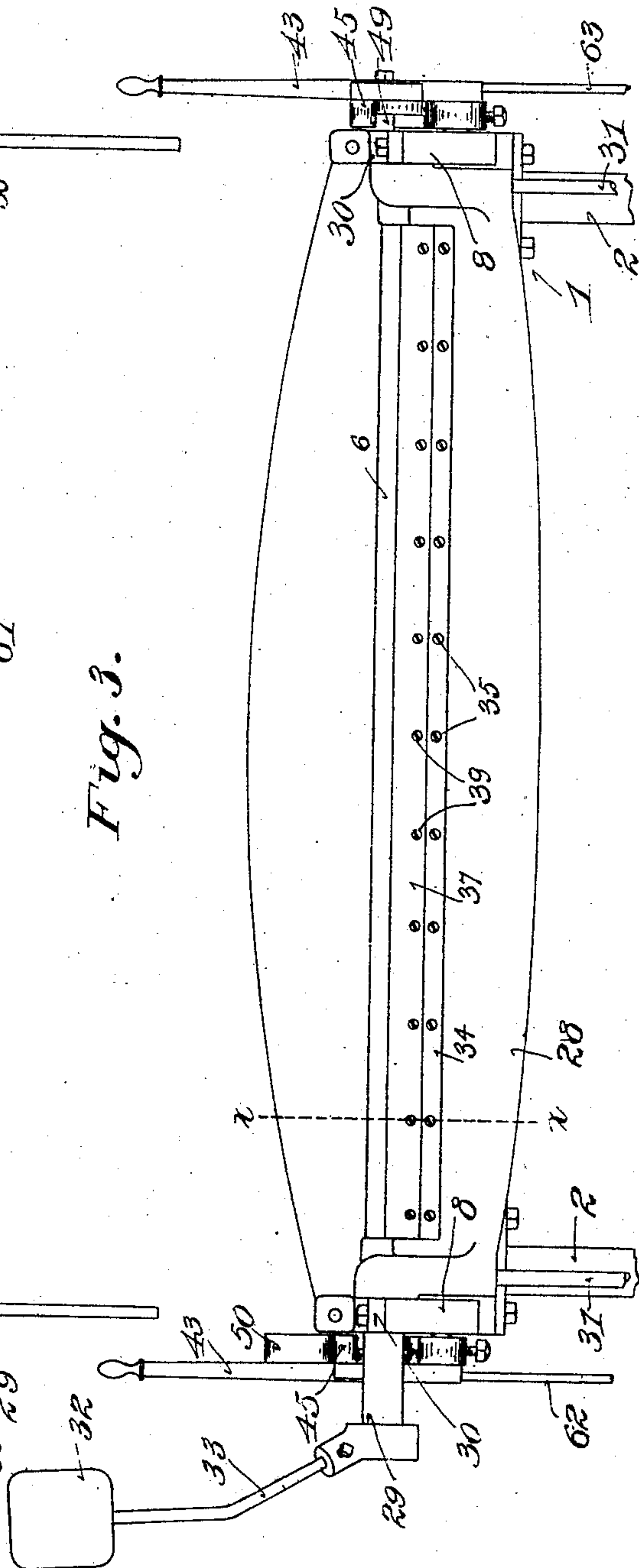


Fig. 3.



Witnesses.

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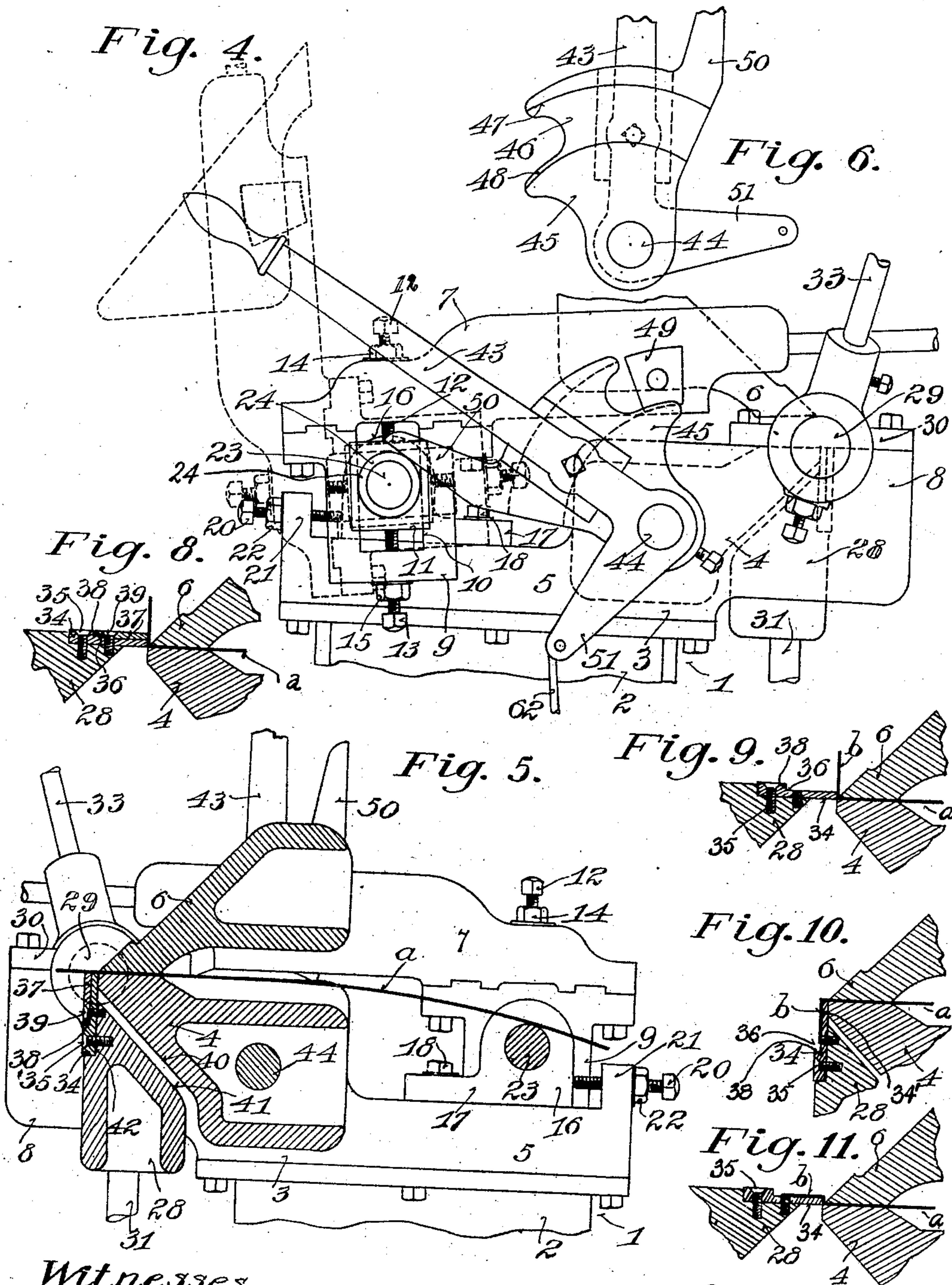
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3 SHEETS—SHEET 3.



Witnesses.

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UNITED STATES PATENT OFFICE.

CLARENCE N. FREY, OF CINCINNATI, OHIO, ASSIGNOR TO THE J. M. ROBINSON MANUFACTURING COMPANY, OF CINCINNATI, OHIO, A CORPORATION OF OHIO.

BRAKE.

No. 840,837.

Specification of Letters Patent.

Patented Jan. 8, 1907.

Application filed July 23, 1906. Serial No. 327,330.

To all whom it may concern:

Be it known that I, CLARENCE N. FREY, 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 Brakes, (Case A,) of which the following is a specification.

My invention relates to improvements in brakes—such, for instance, as brakes for bending sheet metal—and has for its object the providing of various improved instrumentalities in such brakes; and the invention will be readily understood from the following description and claims and from the drawings, in which latter—

Figure 1 is an end elevation of my improved device, partly broken away. Fig. 2 is a plan view of the same. Fig. 3 is a front elevation of the same, partly broken away. Fig. 4 is an end elevation of the forming parts of my improved device, showing the movable clamping-jaw in partly-raised position in full lines and in fully-retracted position in dotted lines. Fig. 5 is a cross-section of the forming parts of my improved device on the line *x x* of Fig. 3. Fig. 6 is a detail of the cam-lever, partly broken away, showing its inner side in side elevation. Fig. 7 is a detail in section on the line *z z* of Fig. 2, showing the mounting for the pivotal shaft of the movable clamping-jaw. Figs. 8, 9, 10, and 11 are details in section, showing my improved bending-leaf performing various operations to which it is applicable.

1 represents the frame, having side standards 2, connected by a bed-piece 3, forming the lower clamping-jaw 4 of the machine, and having rear extensions 5 at its ends.

6 is an upper clamping-jaw, between which and the lower clamping-jaw the sheet to be bent is adapted to be clamped. (See the sheet *a* in Fig. 5.) The upper clamping-jaw has rear extensions 7 at its ends. These rear extensions 7 are located in vertical planes closely adjacent to the vertical planes of the rear extensions 5 at the respective ends of the machine. (See Figs. 2 and 7.) The said rear extensions are pivoted together in the following manner.

9 is a yoke depending from each of the rear extensions 7 and has a slideway 10 therein.

A bearing 11 has sliding fit in this slideway and is adjusted therein by means of adjusting-bolts 12 13 taking against the bearing and secured in place by lock-nuts 14 15.

16 represents bearings on bearing-blocks 17, one of which is adjustably secured to the rear extension 5 at each end of the machine by means of a bolt 18 taking into the extension through a slot 19 in the bearing-block, the said bearing-block being backed by a set-bolt 20, adjustable in a lug 21 at the rear of the extension 5 and held in place by a lock-nut 22.

A shaft 23 extends the entire width of the machine through the bearings 11 11 16 16 at each end of the machine and is held against longitudinal displacement by means of a collar 24, secured to said shaft at each end thereof. This shaft extending the entire width of the machine through the four bearings 11 11 and 16 16 prevents any tilting, teetering, binding, or relative shifting between said bearings or of said shaft and relieves said shaft and all of said bearings of binding stress and makes an exceedingly firm and cheap construction. This shaft also forms a support at the rear of the machine for the sheet being operated on, as shown in Fig. 5.

28 is a bending-leaf pivoted at its respective ends on trunnions 29, journaled in bearings 30 of the cheeks 8 of the bed-piece 3. This bending-leaf is operated in a suitable manner, as by means of levers 31, and may be counterbalanced, as by means of weights 32, secured to arms 33. I provide removable bending-plates for the bending-leaf, whose edges are adapted to make contact with the sheet when bending the same. I make these plates thin and permit removal for enabling me to make very small reverse bends. Thus I provide a plate 34, secured to the bending-leaf by bolts 35, the said plate having a recess 36, forming a rabbet for receiving a removable plate 37, whose lower edge rests on a shoulder 38 of the plate 34. The plate 37 is secured to the bending-leaf by means of bolts 39. The plates 34 37 extend longitudinally of the bending-leaf, as shown in Figs. 2 and 3.

In practice the bending-leaf is formed of

iron and the plates of steel, and I prefer to have these plates extend at right angles to the plane of the clamping-surface of the stationary clamping-jaw and to secure them to the outer side of the bending-leaf. The lower clamping-jaw is slantingly undercut at its front, as shown at 40, for accommodating the bending-leaf thereunder, the upper rear face of the bending-leaf being correspondingly tapered, as shown at 41. The plate 34 is secured in a rabbet 42 at the front of the bending-leaf and extends upwardly beyond the paper 41. (See Fig. 5.) The edges of the plates 34 37 make contact with the sheet for bending the same. The construction explained permits me to make bending-faces of steel or other hardened metal, thereby prolonging the life of the machine, and also permits me to make exceedingly narrow reverse bends on a machine of this character. In the ordinary bending operation I employ both of the bending-plates so as to get a reinforced bending-surface upon the sheet while being bent, this operation being shown in Figs. 5 and 8. If now it is desired to make a very narrow reverse bend—for instance, a quarter-inch reverse-bend for cornice-work—the plate 37 is removed, leaving the edge of the plate 34 to perform the office of bending. The first bend is accomplished in the ordinary manner, as exemplified in Fig. 9. The bending-leaf is then returned to normal position and the sheet unclamped, reversed, and replaced in the machine, with the bent part *b* resting against the face 34' of the plate 34, as shown in Fig. 10, which permits the corner which has been formed by the first bend to be closely adjacent to the outer edges of the clamping-jaws. When now the bending-leaf is swung upwardly, the sheet is provided with a very narrow reverse-bend, as exemplified in Fig. 11.

For clamping the upper or movable clamping-jaw upon the stock being operated on I provide a clamping-lever 43 at each end of the machine. These clamping-levers are both secured to a shaft 44, the clamping-levers thereby operating in unison. The clamping-levers comprise a cam-plate 45, having a cam-slot 46 on its inner face, the cam-slot comprising upper and lower cam-walls 47 48, adapted to make engagement with a cam-block 49 at each end of the movable clamping-jaw. The slot 46 is described on a circle whose center is located forwardly of the rocking axis of the shaft 44, so that as the bending-lever is forced forwardly the upper clamping-jaw is forced toward the stationary clamping-jaw for clamping the sheet to be operated on. The upper clamping-jaw is also adapted to be swung upwardly into fully-retracted relation with the lower clamping-jaw by bringing the walls of the cam-slot 46 out of range of the cam-block. (See the

upper clamping-jaw swung past a vertical plane, as shown in dotted lines in Fig. 4.) This is for the purpose of making the space between the clamping-jaws completely accessible for accommodating various classes of bent work.

If it is desired to swing up the upper clamping-jaw in this manner, the cam-lever is thrown rearwardly for bringing the forward edge of the cam-wall 47 out of line with the cam-block, the said cam-wall being abbreviated at its forward end. One of the cam-plates is provided with a normally upwardly extending ear 50, which is adapted to make contact with and rest on one of the collars 24 for limiting the rearward movement of the cam-levers and thereby preventing the handles on the levers getting out of reach from the front of the machine. It is also desirable that said cam-plate be operated by treadle-power, and for this purpose I provide the cam-lever at one end of the machine with a rearwardly-projecting arm 51 and the cam-lever at the other end of the machine with a forwardly-projecting arm 52, constituting said levers bell-crank levers. Adjacent the lower end and at the rear of the frame I provide a divided rock-shaft 53 54, the division of the same (shown at 55) being in collars 56^a 56^b of a bearing 56, secured to the floor, the respective sections 53 54 of said divided rock-shaft also being journaled in collars 57^a 57^b of bearings 57 in the side standards. At the respective ends thereof, adjacent said side standards, the said rock-shafts 53 54 are respectively provided with treadles 58 59. Approximately at the middle in width of the machine the said sections of said rock-shaft are also provided with treadles 60 61. A link 62 connects the arm 51 and the treadle 58, and a link 63 connects the arm 52 and the treadle 59. The treadles 58 and 60 are normally in position opposite to that of the treadles 59 and 61. In other words, when the former are raised the latter are depressed, and vice versa, this arrangement insuring that any reversal of the upper clamping-jaw into clamped or unclamped position may be effected by a downward pressure upon a treadle. Thus a downward pressure upon either of the treadles 58 or 60, whereby the section 53 of the rock-shaft will be rocked in one direction, will cause an unclamping of the upper clamping-jaw, the clamping-blocks thereof riding on the lower cam-walls 48 of the cam-plates for raising the upper clamping-jaw, whereas depressing of either treadle 59 or 61 and the rocking of the rock-shaft section 54 in the opposite direction will cause the cam-plates to be swung forwardly for causing the upper cam-walls 47 to ride upon the cam-block, and thereby depress the movable clamping-jaw for clamping the sheet between it and the stationary clamping-jaw.

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

1. In a brake, the combination of a bed-piece comprising a lower clamping-jaw and having a rear extension at each end of the bed-piece, an upper clamping-jaw having a rear extension at each end thereof, the said rear extensions at the respective ends of said bed-piece and upper clamping-jaw being adjacent to each other, a bearing on each extension, said bearings being in the same axial plane, and a shaft in said bearings extending throughout the entire width of said clamping-jaws forming a rear support for the material clamped between said clamping-jaws, substantially as described.

2. In a brake, the combination of a bed-piece comprising a lower clamping-jaw and having a rear extension at each end thereof, a movable clamping-jaw having a rear extension at each end thereof, a bearing at the rear end of each of said extensions in the same axial plane, a shaft extending there-through and acting as a rear support for the sheet clamped between said clamping-jaws, a cam-block at each end of said movable clamping-jaw, a cam-lever at each end of said bed-piece comprising a cam-plate having a cam-groove with a lower and an abbreviated upper cam-wall adapted to make engagement with said cam-blocks, said cam-plates also having an extension which is normally upright, said extension supported from said shaft and acting as a stop for said cam-levers when the latter are retracted, substantially as described.

3. In a brake, the combination, with a pair of clamping-jaws, of a bending-leaf, bending-plates thereon whose edges are

adapted to contact the sheet for bending the same, and means for securing said bending-plates flatwise against the bending-leaf and each other, said securing means being constructed and arranged for permitting successive removal of said bending-plates, substantially as and for the purpose described.

4. In a brake, the combination, with the clamping-jaws, of a bending-leaf having an upper front rabbet therein, a bending-plate in said rabbet and having an upwardly-opening rabbet at its front, a removable bending-plate in said last-named rabbet, the edges of said bending-plates being normally projected upwardly for forming the bending-surface for said bending-leaf, and means for securing the said bending-plates flatwise of each other in said rabbets, substantially as and for the purpose specified.

5. In a brake, the combination with the clamping-jaws, of a bending-leaf, a plurality of bending-plates, the upper edges of said plates forming bending-faces for said bending-leaf, and means for securing said bending-plates flatwise of each other to said bending-leaf, said securing means permitting one or more of said bending-plates to form the bending-face for said leaf, the bending-plate nearest said bending-leaf having an outer side face closely adjacent to the outer meeting edges of said clamping-jaws for permitting very narrow reverse bends to be formed, substantially as and for the purpose described.

In testimony whereof I have signed my name hereto in the presence of two subscribing witnesses.

CLARENCE N. FREY.

Witnesses:

HENRY N. BAUER,
CORDELIA O'HEARN.