

(No Model.)

E. F. LEWIS.
PRESSURE PLATE.

No. 472,301.

Patented Apr. 5, 1892.

FIG-1

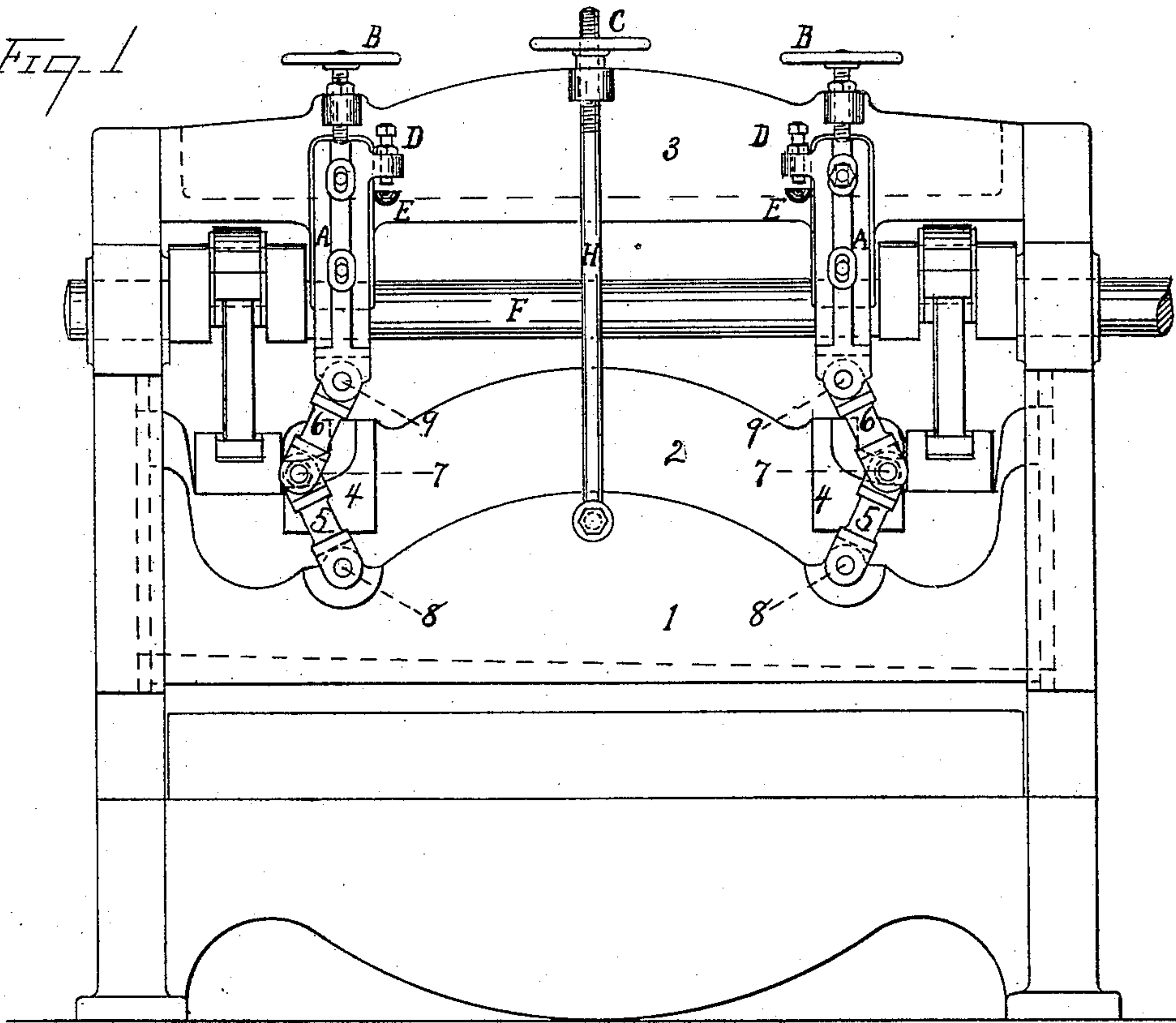


FIG-3

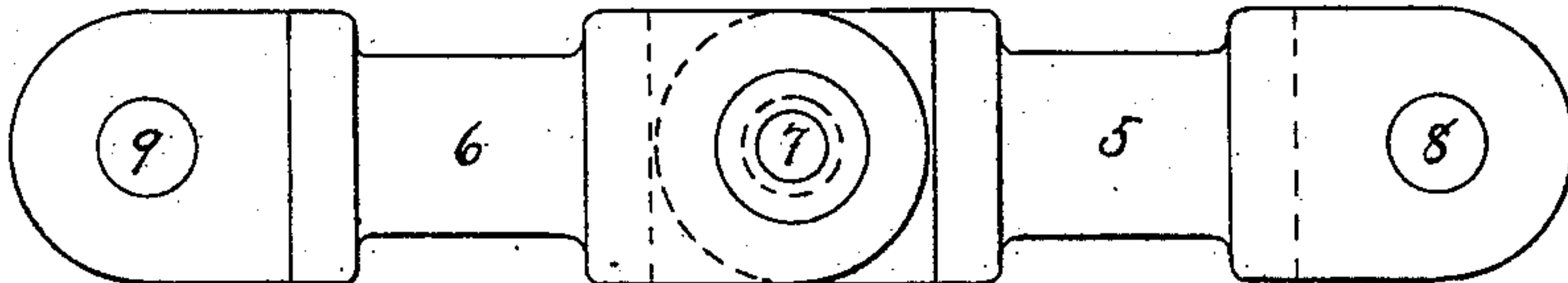


FIG-4

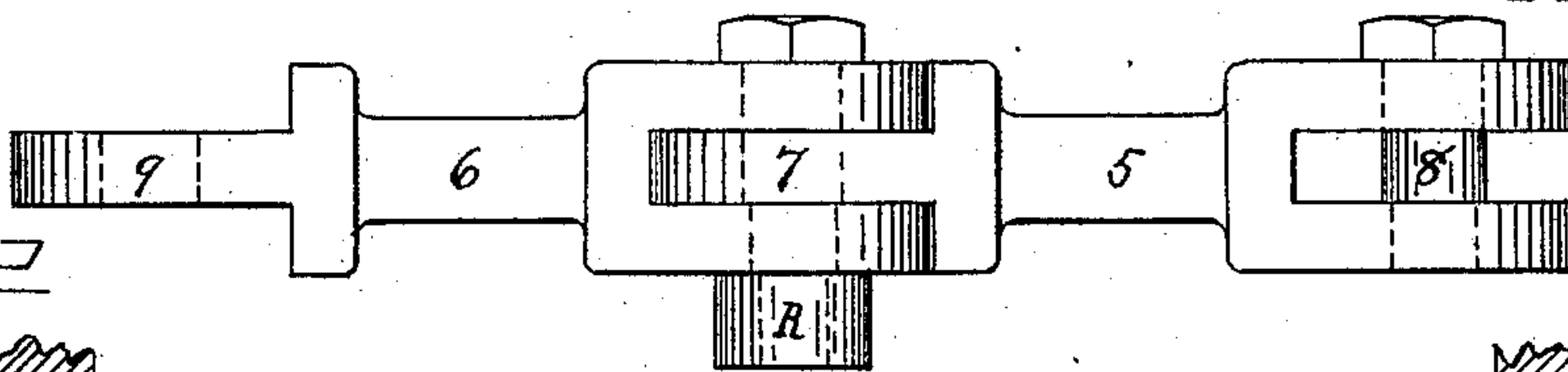
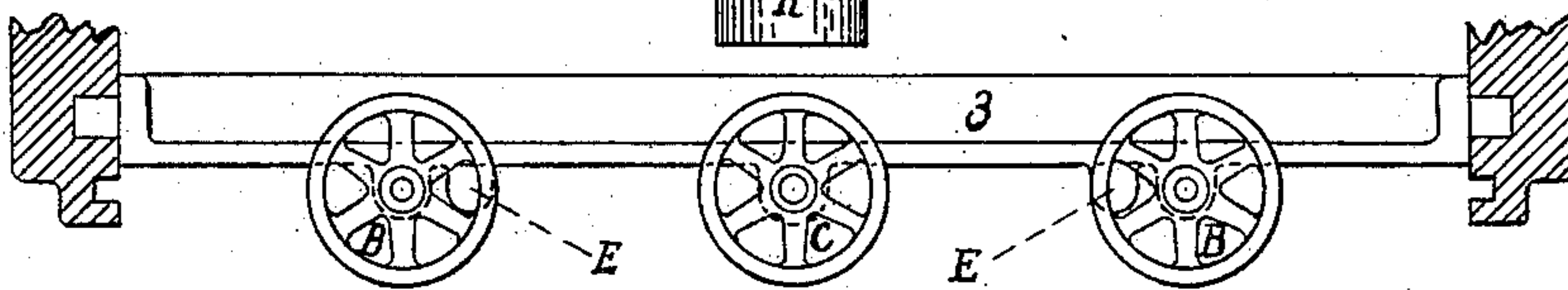


FIG-2



Witnesses.
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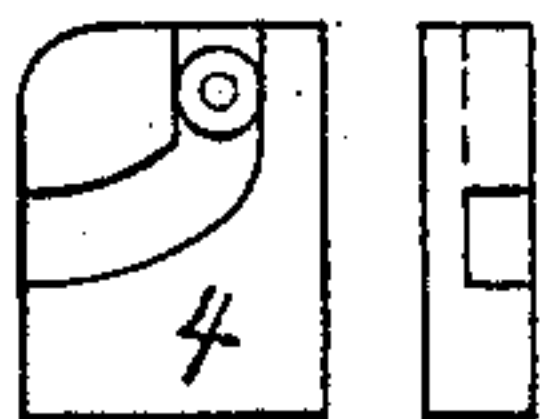


FIG-5

Inventor.
E. F. Lewis.

UNITED STATES PATENT OFFICE.

EDWARD F. LEWIS, OF WATERBURY, CONNECTICUT, ASSIGNOR TO THE
WATERBURY FARREL FOUNDRY AND MACHINE COMPANY, OF SAME
PLACE.

PRESSURE-PLATE.

SPECIFICATION forming part of Letters Patent No. 472,301, dated April 5, 1892.

Application filed December 14, 1891. Serial No. 415,320. (No model.)

To all whom it may concern:

Be it known that I, EDWARD F. LEWIS, of Waterbury, in the county of New Haven and State of Connecticut, have invented a new and
5 useful Improvement in Pressure-Plates; and I do hereby declare the following, when taken in connection with accompanying drawings and the letters and figures of reference marked thereon, to be a full, clear, and exact descrip-
10 tion of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a front view of a metal-squaring shear with pressure-plate attached, showing
15 its connection with the toggles and the cams by which the toggles are operated; Fig. 2, a view looking on the top of Fig. 1; Fig. 3, an enlarged view of one pair of toggles as seen from in front; Fig. 4, a view looking on the
20 top of Fig. 3 and showing the roll which controls the toggle-joint; Fig. 5, a front and side view of one of the cams detached.

This invention relates to an improvement in that class of pressure-plates which are in-
25 tended to hold sheets of metal or other material while being operated upon by shears or punches; and the object of my improvement is, first, to provide a certain and unvarying pressure; second, to afford facilities for the
30 proper adjustment of the pressure-plate independently of the positions of the moving parts of the machine to which it is attached; third, to afford facilities for disconnecting the driving mechanism of the pressure-plate
35 and suspending the pressure-plate in such a manner as not to interfere with the proper working of the rest of the machine, and, fourth, to construct an automatically-operated pressure-plate which does not throw any
40 strain or wear on the driving mechanism while it is holding the metal with the desired pressure. These objects are attained in a very simple and effective manner by the mechanism illustrated in the accompanying draw-
45 ings.

2 (see Fig. 1) represents the main gate of the metal-squaring shear shown. The gate is guided by ways at each end and has a reciprocating sliding motion imparted to it by
50 cranks on the main shaft F. Along its under side and at a slight angle is attached a knife,

which shears with a corresponding knife set in the bed-plate.

The machine and its operation are well known and do not need to be more particu- 55
larly described.

On certain classes of work it is necessary that the material to be sheared should be held rigidly against the bed-plate. This is accom-
60 plished by means of another sliding gate or pressure-plate 1, which is guided by ways at each end to slide in close proximity and parallel to the main gate 2. Its lower side or foot is planed smooth and parallel to the bed-
65 plate.

The pressure-plate as commonly constructed is operated through necessary rolls and levers by a cam attached to the main shaft F. Its relative time of action with the main gate
70 is such that its downward movement is completed before the knives commence to shear, and the shape of the cam is such that the pressure-plate remains stationary while the knives continue to shear and until they separate. The distance between the foot of the
75 pressure-plate when down and the bed-plate is usually adjustable, enabling it to hold different thicknesses of metal. This construction is generally unsatisfactory, because any
80 little wear or unevenness in the holding-surface of the cam makes a varying pressure; also, because it is difficult of adjustment, requiring the machine to be turned carefully
85 by hand until the pressure-plate is in its lowest position, because it must either operate in connection with the rest of the machine or
else be removed entirely, and, lastly, because the strain remains on the moving parts of the machine while the pressure is sustained,
90 causing rapid wear and a great deal of friction.

My invention relates particularly to an improvement in the second sliding gate or pressure-plate; and it consists in the construction hereinafter described, and more particularly 95
recited in the claims.

4 represents cam-shaped pieces, preferably of steel, bolted firmly to front side of main gate 2. A steel roll R, revolving on a stud
7, fits the groove in the cam. An extension 100
of the stud 7 forms a center pin, on which the two toggle-pieces 5 and 6 are hinged.

The other extremity of the piece 5 is hinged by means of a pin 8 to the pressure-plate 1, while the other toggle-piece 6 is hinged at its other end by a pin 9 to a piece A, which is bolted to the frame of the shear. The pieces thus joined form what is known as a "toggle-joint." In the machine shown in Fig. 1 there are two toggle-joints; but, as they are counterparts, a description of one will answer for both.

The cam 4 is so shaped and placed on the main gate 2 that the roll R is brought into the same line with the centers 8 and 9 by the downward motion of the main gate, as shown in Fig. 3. This action rigidly and firmly closes the pressure-plate upon the sheet of metal to be sheared, the strain being exerted wholly and entirely through the frame of the machine. The cam 4 acts merely to hold the roll R in the line of the centers 8 and 9, thus being relieved of all strain while the metal is being sheared. The main gate after reaching the bottom of its stroke begins to move upward, the pressure-plate remaining stationary until the bend or curve in the cam 4 breaks the line of centers in the toggle-joint. From this point to the top of the stroke the pressure-plate rises more or less with the main gate, according to the shape of the cam 4. The stroke of either gate and the relative position of one to the other may be altered to suit the conditions imposed by the work to be done.

In representing the cam 4 as attached directly to the main gate 2 I do not wish to be understood as limiting this part of the invention to this particular arrangement, as the cam may be at a distant point and connected by means of gears and levers to the toggle-joint. It will be understood by those skilled in the designing of automatic machinery that the relative positions of the cam and engaging roll may be reversed, the cam, with some alteration in shape, being attached to the toggle, while the roll is attached to the main gate. If after the main gate 2 has reached its highest point we continue to lift the pressure-plate 1, the cam-groove 4 is so shaped that the roll R can pass out of engagement. The main gate is then free to reciprocate up and down without affecting the pressure-plate so long as the latter is held suspended. A rod H is provided for thus raising or lowering the pressure-plate or suspending it. Its lower end is attached to the pressure-plate by a bolt or any convenient device, while its upper end is threaded and extends through a boss or projection provided on the yoke 3 of the frame. A hand-wheel containing a nut fits the threaded end of the rod, and by turning this wheel the pressure-plate may be lifted out of connection or lowered into connection with the main gate. When the two gates are in connection, the rod H should be detached. This may be repeated any number of times without readjusting the pressure-plate, as it will always come back to its former position. This

is a great advantage, as it enables the operator to discontinue work on a certain size and cut odd sizes at any time, returning to the original size again with the least possible loss of time.

The piece A, which has the stationary center of the toggle at its lower end, is bolted to the yoke 3. The bolts pass through oblong holes, thus allowing for an adjustment up or down. A screw with hand-wheel B attached, tapped through a projection on the yoke, gives a means of forcing the piece A down and also for lifting it up. It is evident that by raising or lowering this piece the pressure-plate will descend to a position nearer or farther from the bed-plate, thus allowing for different sizes to be held. Projecting from the piece A is a boss D, through which is a set-screw. Directly underneath the set-screw is a projection E, extending from the yoke. The set-screw is adjusted so as to just touch the projection E when the foot of the pressure-plate rests upon the bed-plate. It is therefore a constant gage and shows at any time just how near to the bed-plate the pressure-plate will descend. It is only necessary, therefore, in order to set pressure-plate for a certain thickness of metal to raise or lower the piece A until the gage fits the metal to be held.

While I have particularly described my invention as applied to a metal-squaring shear, it will be understood that it is equally applicable to other machines of the nature of double-action presses.

I claim—

1. In a double-action power-press, the combination of the pressure-plate, a vertical reciprocating slide or main gate carrying one shear-blade, a driving-shaft substantially such as described to impart reciprocating movement to the blade-slide or main gate, a vertically-adjustable slide A on the frame, a toggle or toggles, one link of which is hinged to the pressure-plate, the other link hinged to said vertically-adjustable slide A, and mechanism substantially such as described between the links and the main gate, whereby on a downward movement of the main gate said links are forced into line to bring the pressure-plate to its gripping position in advance of the main gate and retain said links in line during the operation of shearing and then on an upward movement of said main gate to turn said links out of line to withdraw the pressure-plate, substantially as described.

2. In a double-action power-press, the combination of the pressure-plate, a main gate carrying a shear-blade, mechanism substantially such as shown to impart reciprocating movement to the main gate, a vertically-adjustable slide A on the frame, a toggle or toggles, one link of which is hinged to the pressure-plate, the other link hinged to said vertically-adjustable slide A, a screw-rod B, extending through a nut in the frame and attached to the slide A, whereby the slide A may be raised or lowered to set the pressure-

plate according to the thickness of the metal to be held, and a gage for the purpose specified, consisting of one part D, attached to slide A, and another part E, attached to frame, the two parts making contact when the slide A is so adjusted that the pressure-plate in its gripping position makes contact with the bed-plate.

3. In a double-action power-press, the combination of a pressure-plate, a vertically-movable slide or main gate, mechanism substantially such as shown to impart reciprocating movement to the main gate, a vertically-adjustable slide A on the frame, a toggle or tog-

gles, one link of which is hinged to the pressure-plate, the other link hinged to said vertically-adjustable slide A, and a rod H, attached at one end to the pressure-plate, the other end threaded and entering a hand-nut supported by the frame, whereby the pressure-plate may be elevated and the said toggle-links turned out of line to disengage them from the controlling-cams.

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Witnesses:

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