

J. A. SAFFORD.

Mechanisms for Operating Punches, &c.

No. 156,651.

Patented Nov. 10, 1874.

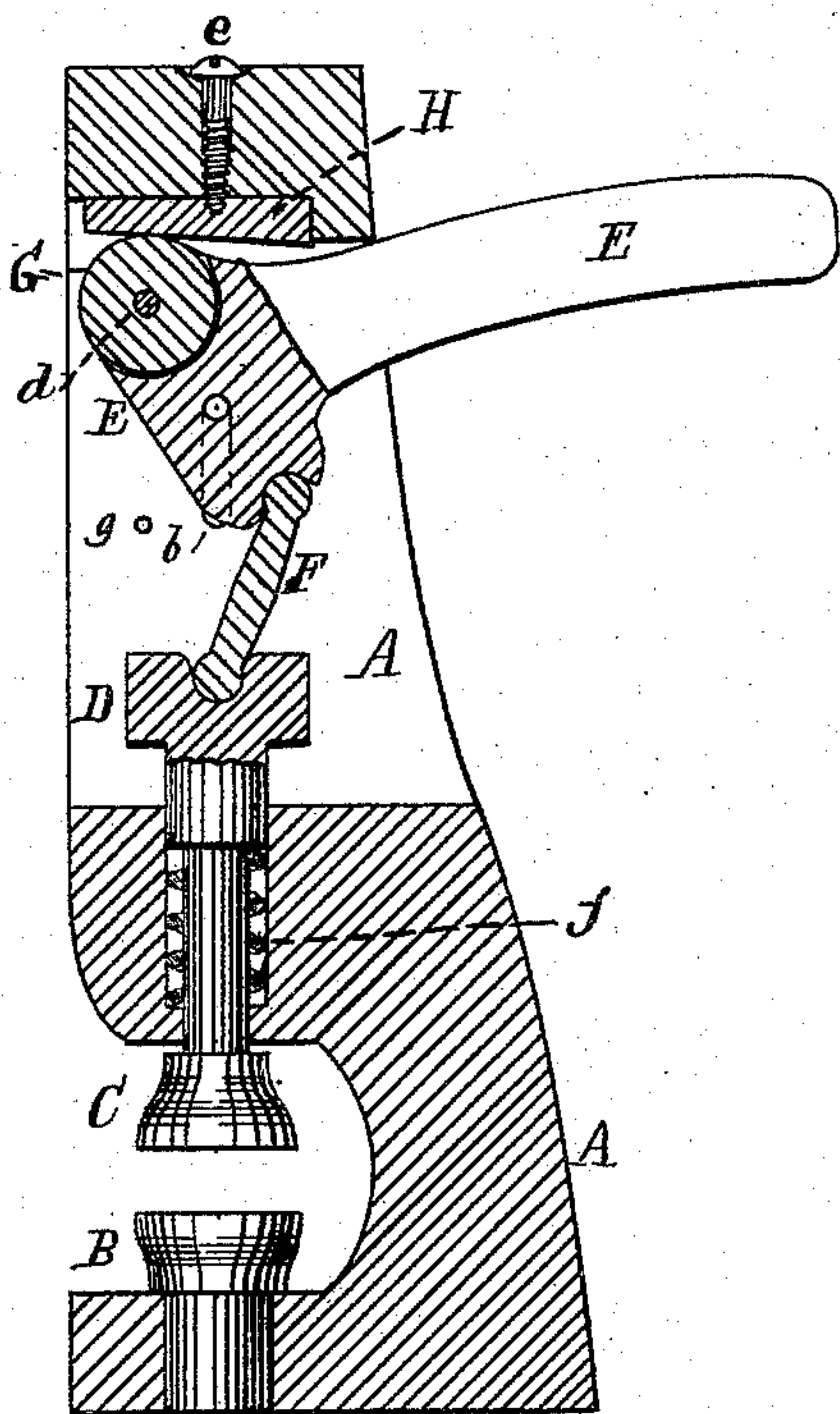


Fig. 3.

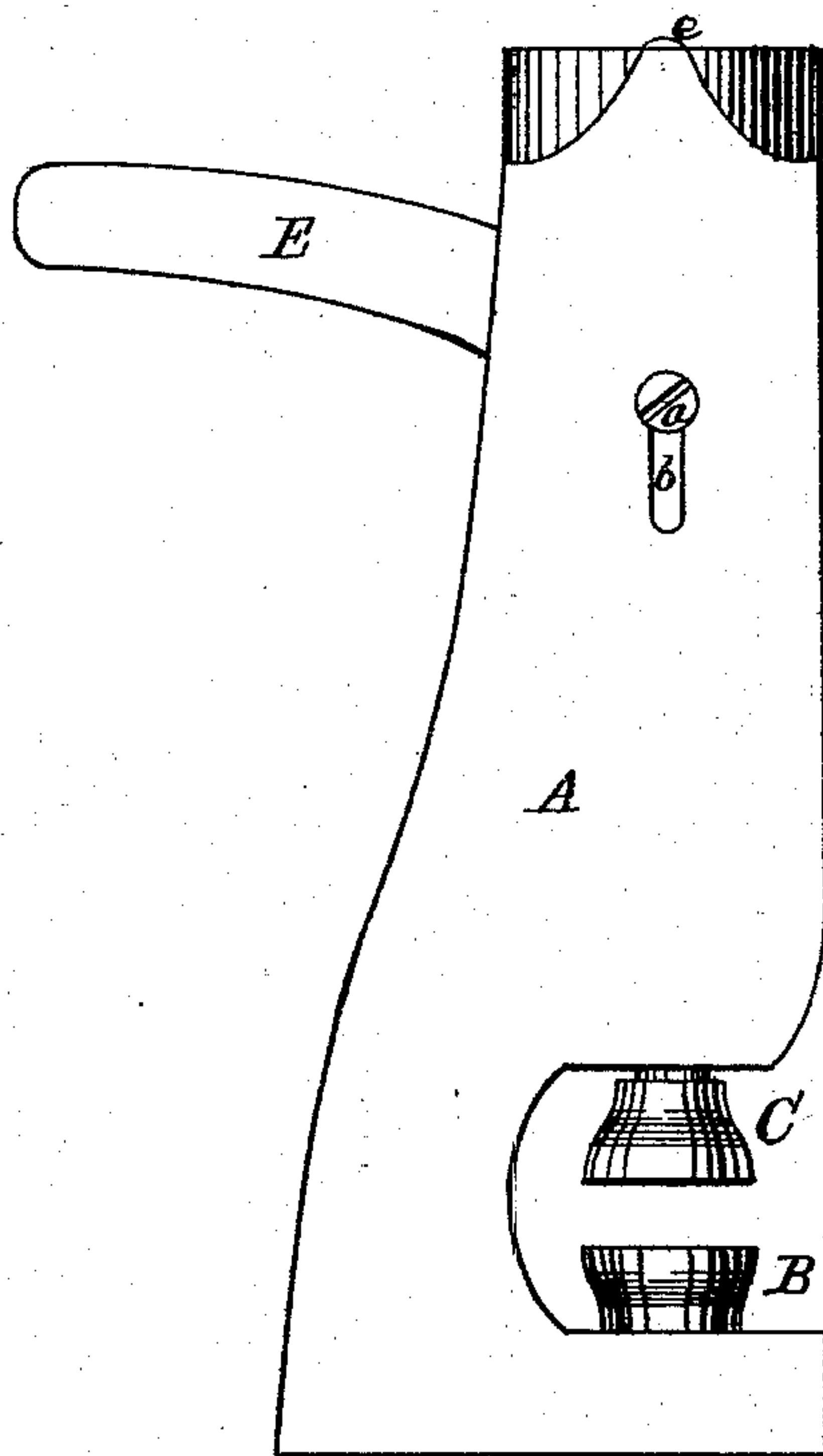
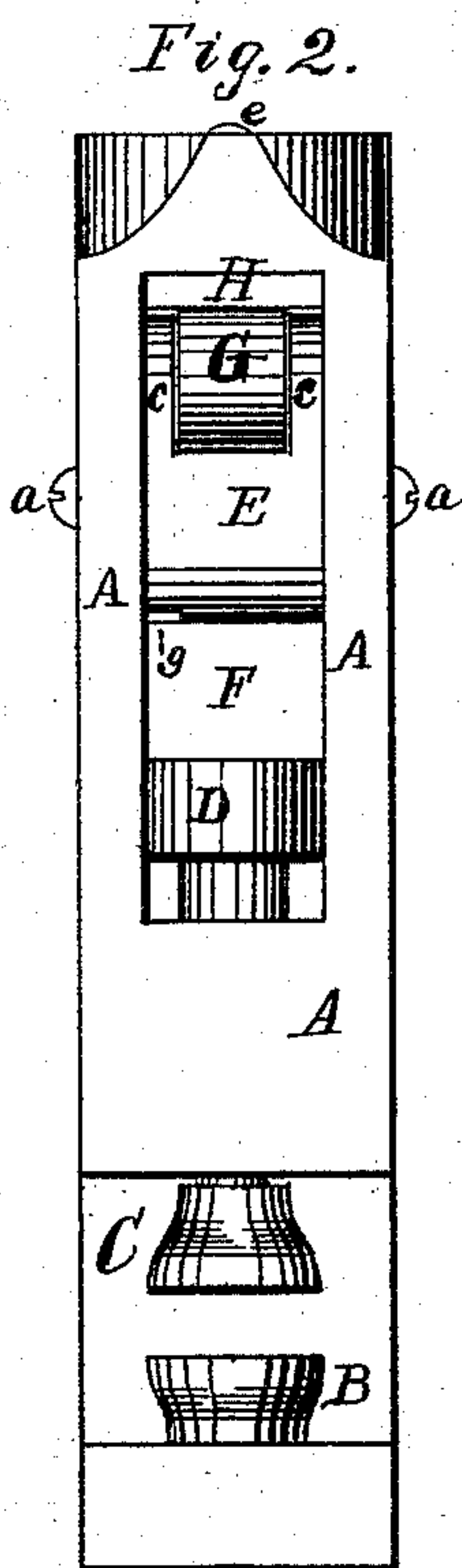


Fig. 1.

Witnesses.
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UNITED STATES PATENT OFFICE.

JOSEPH A. SAFFORD, OF WINCHESTER, MASSACHUSETTS.

IMPROVEMENT IN MECHANISMS FOR OPERATING PUNCHES, &c.

Specification forming part of Letters Patent No. **156,651**, dated November 10, 1874; application filed March 7, 1874.

To all whom it may concern:

Be it known that I, JOSEPH A. SAFFORD, of Winchester, in the county of Middlesex and State of Massachusetts, have invented a new and useful Mechanical Movement, of which the following, taken in connection with the accompanying drawings, is a specification:

My invention relates to an improved mechanical movement for operating punching and embossing presses, and for various other purposes where great power is required; and it consists in the use of a T-shaped or three-armed lever, arranged to vibrate about an axis placed at or near the junction of said arms, and that is free to move in the direction that the power is to be exerted, in combination with a toggle-link or strut, one end of which rests upon, or is connected to, one of the short arms of said lever, and the other end of which is connected to the plunger or other object to be moved, and an anti-friction truck, suitably mounted in the end of the opposite arm thereof, and arranged to roll along the surface of an abutment attached to, or forming a part of, the fixed frame of the machine, as said lever is vibrated when said abutment is so arranged, with relation to the movement of said truck, that its movement along the same shall cause said axis to move in a line with the desired movement of the die or other object to be operated upon, as will be further described.

In the drawings, Figure 1 is a side elevation of a press with my improvement applied. Fig. 2 is a front elevation. Fig. 3 is a vertical section on line *xx* on Fig. 2.

A is the frame of the press; B, the bed-die, and C the movable die attached to the lower end of the plunger D, fitted to move up and down in a bearing formed in the frame A. E is a lever provided with the trunnions *a a*, fitted to the slots *b b* formed in either side of the frame A, in which they are free to move up and down as said lever is vibrated about its axis, of which said trunnions are prolongations. The lever E is also provided with suitable means of connection to the strut or link F, the opposite end of which is connected to the plunger D in any well-known manner, and with an anti-friction truck, G, mounted upon the pin *d* passing through the ears *c c* formed upon the side of said lever opposite to the strut F, said truck being ar-

ranged to roll along the surface of a fixed or stationary abutment, H, so arranged that said movement of the truck, caused by the vibration of the lever E about its axis of motion, shall cause said axis to be moved away from said abutment in a line with the movement of the die C.

In the case shown in the drawings, the abutment H is a removable plate, secured to the frame A by the screw *e*, its under surface, upon which the truck G acts, being inclined to the line of motion of the plunger D and die C; but in cases where less motion is required said under surface may be made at right angles to said line of motion.

The plunger D and die C are moved upward again, after being depressed by the action of the lever E, by the spring *f* surrounding said plunger, and inclosed within the frame.

This arrangement of parts constitutes a very powerful, and still a very easily operated, piece of mechanism, working with less friction, and, consequently, more powerful, than a simple toggle-joint, and, at the same time, giving a greater movement without corresponding loss of power.

The motion of the lever E is limited, in a downward direction, by the stop-pin *g*.

This device, in one or both of its forms, is applicable to a variety of uses; among which I will mention, in addition to the punching or embossing press, the adjustment of the bed-roll of a pair of pressure-rolls for rolling leather and other substances.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

The T-shaped or three-armed lever E, arranged to vibrate about a movable axis located at or near the junction of said arms, and having the anti-friction truck G mounted in the end of one of said arms, in combination with a fixed inclined or horizontal abutment, H, and the toggle-link or strut F, all arranged to operate substantially as described, for the purpose specified.

Executed at Boston this 4th day of March, 1874.

JOSEPH A. SAFFORD.

Witnesses:

WM. P. EDWARDS,
N. C. LOMBARD.