2 Sheets—Sheet 1.

J. T. BEDFORD.

Mechanism for Actuating Punches, Shears, and Stamps.

No. 216,593. **Patented June 17, 1879.**

Fig1.

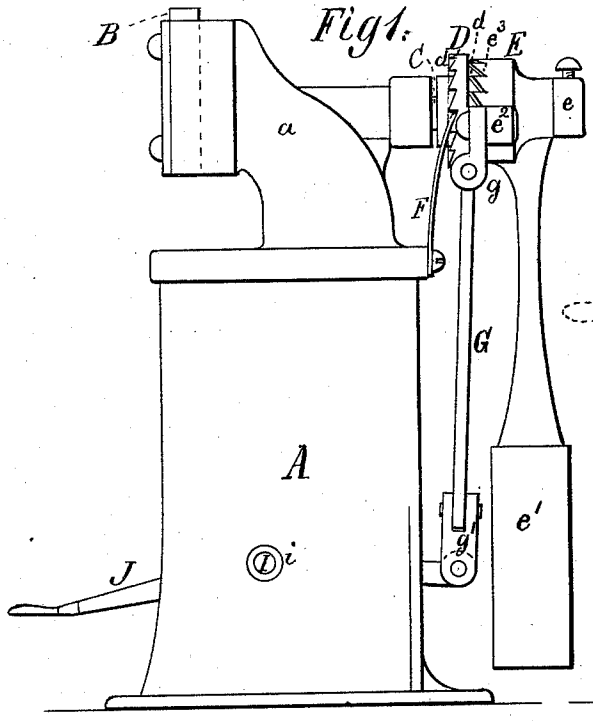


Fig2.

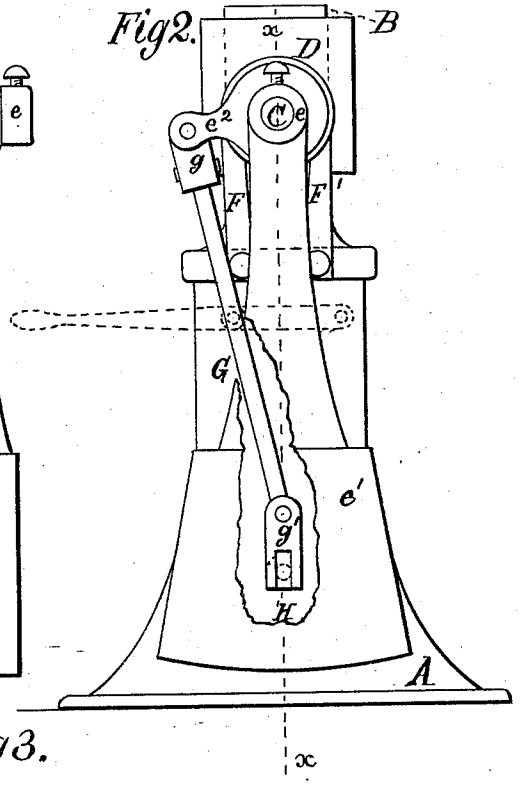


Fig3.

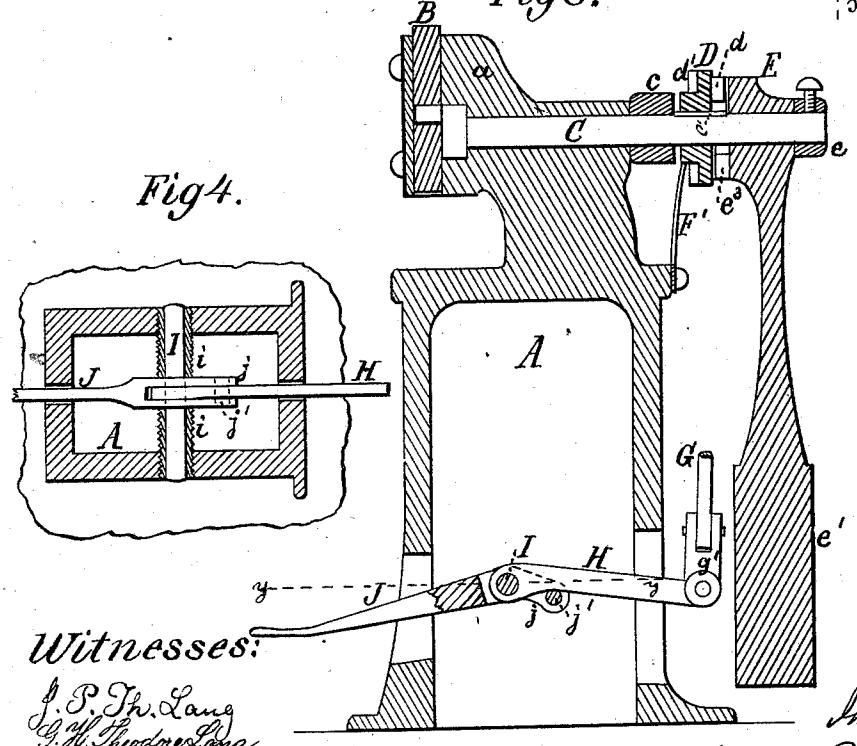


Fig4.

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G. H. Theodore Lang

Inventor:

Joseph T. Bedford
by Munn, Pennick & Lawrence

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

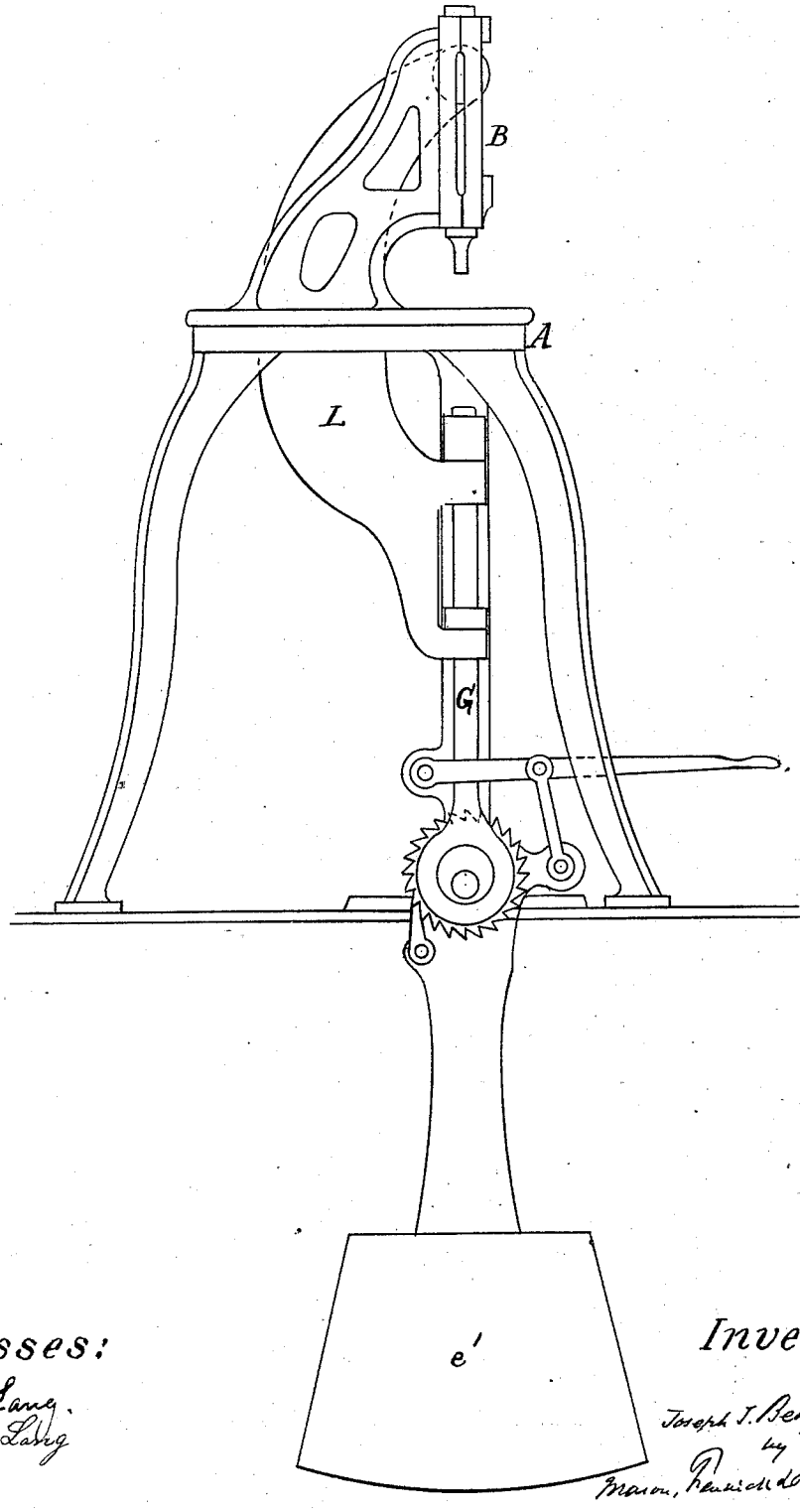
2 Sheets—Sheet 2.

J. T. BEDFORD.

Mechanism for Actuating Punches, Shears, and Stamps.

No. 216,593. **Patented June 17, 1879.**

Fig 5.



Witnesses:

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UNITED STATES PATENT OFFICE.

JOSEPH T. BEDFORD, OF NEW YORK, N. Y.

IMPROVEMENT IN MECHANISMS FOR ACTUATING PUNCHES, SHEARS, AND STAMPS.

Specification forming part of Letters Patent No. **216,593**, dated June 17, 1879; application filed January 31, 1879.

To all whom it may concern:

Be it known that I, JOSEPH T. BEDFORD, of the city, county, and State of New York, have invented a new and useful Improvement in Mechanism for Actuating Punches, Shears, and Stamps of Punching, Shearing, and Stamping Machines, which improvement is fully described in the following specification and annexed drawings, in which latter—

Figure 1 is a side elevation of the machine. Fig. 2 is a rear elevation of the same. Fig. 3 is a vertical central section in the line *x x* of Fig. 2, and Fig. 4 is a horizontal section in the line *y y* of Fig. 3, showing an improved treadle-movement. Fig. 5 is a diagram of a modified construction of the machine.

My invention consists of improved mechanism for actuating punches, shears, and stamps of punching, shearing, and stamping machines in which the pendulum is employed with other mechanism for producing rotary motion of a shaft or eccentric, thereby operating the punching-slide or other slide.

It consists, also, in a pendulum-weight, a connecting-rod, and a treadle of novel construction, whereby the upward swinging motion of the pendulum, without check to its movement, may exceed the stroke of the treadle.

In the annexed drawings, A represents the main body or stand of a punching or shearing machine; B, the slide which carries the punch or shear, and C the crank-shaft which operates the slide. The crank-shaft C is snugly fitted into the head *a* of the machine, as seen in Fig. 3, and prevented from longitudinal movement by a shoulder or collar, *c*, at the rear side of the machine. Next to the collar *c* a double ratchet-head, D, is loosely fitted, so as to slide upon the shaft C, which is there provided with a straight key, *c'*, in order to cause the shaft and double ratchet-head to revolve together, and also to permit the ratchet-head to move longitudinally upon the shaft.

Next to the ratchet-head D a ratchet-head, E, is loosely fitted upon the shaft C, and held in position by a collar, *e*, so as to rotate upon said shaft. The ratchet-head E is provided with a heavily-weighted pendulum, e^1, and a lever-arm, e^2. Two tension-springs, F F', suitably fastened to the stand A, push the ratchet-head D against the ratchet-head E, and keep them geared together, the ratchet-surface e^3 of the head E and the ratchet-surface *d* of the head D being constructed to match each other. The ratchet-surface *d'* of the head D corresponds in construction with the ratchet-surface *d*. The springs F F' bear against the surface *d*, and the spring F serves as a pawl for preventing back movement.

The lever-arm e^2 is, by means of a connecting-rod, G, and ordinary accommodating joints *g g'*, connected to a lever, H, which swings on a fulcrum-pin, I. The pin I is inserted into two screw-threaded sleeves, *i*, which are screwed into opposite sides of the stand A, and between the ends of these sleeves the forked fulcrum end *j* of a treadle-lever, J, together with the fulcrum end of the lever H, are laterally confined in position, as shown in Fig. 4.

The forked end *j* of the treadle-lever J extends back beyond the pin I, and is, below the lever H, provided with a transverse pin, *j'*, thus forming the means whereby the lever H is thrown up by the treadle, and allowing the pendulum-arm e^2, when necessary, to rise up higher than the stroke of the treadle.

Operation: For the purpose of punching, the slide B is, as usual, provided with a suitable punch, and the stand A with a corresponding die. The metal plate to be punched is placed upon the die, and the treadle-lever forced down, whereby the lever H is forced up and the pendulum-weight e^1 swung to the right.

If the crank of the crank-shaft C has been standing to the left, the slide B is moved down with the first stroke of the treadle, and the punch of the slide thus pierces the metal plate; but if the crank occupies another position previous to the operation of the machine, one or several strokes of the treadle will be necessary, in order to bring the crank in the position most favorable for the punching-stroke of the machine.

It will be seen that by a judicious use of the treadle the crank can be adjusted as accurately as desired before each punching-stroke.

The pendulum-weight e^1 after each stroke swings back freely, the ratchet-surface e^3 of its head E gliding over the ratchet-surface *d* of

the head D, which remains stationary during each back stroke. The clutch or head D can be moved in and out of gear by means of a hand-rod or other device.

It is necessary to so adjust the crank of the shaft C as to make allowance for a "start" of the pendulum-weight; or, in other words, the pendulum-weight should be allowed to perform a part of its stroke before the punch of the slide comes in contact with the metal plate to be punched, in order to increase the power exerted by the operator by the impetus of the swinging pendulum-weight. This increase of power is so great that one man is enabled to perform with my improved machine the work of several operating a machine of ordinary construction.

My invention is also adapted for metal shearing, stamping, and so on.

In Fig. 2 I have indicated by dotted lines how a hand-lever may be substituted for the treadle, for the purpose of operating my machine; and in Fig. 5 I have shown how the crank-shaft and pendulum-weight might be differently applied in connection with the machine, and attached to the floor of a shop, in order to use a heavier pendulum without affecting the stability of the machine during its operation.

The connections between the pendulum e^1 and the slide B are a connecting-rod, G, and a curved link, L, secured in proper guides of the standard A.

What I claim is—

1. An improved machine consisting of a combination of a rotary crank or eccentric power-shaft, a pendulum connected to the shaft, a lever mechanism which imparts to the pendulum a reciprocating motion, and a clutching mechanism which communicates to the shaft from the pendulum a rotary motion, and a slide or its equivalent, which carries the operating-tool, substantially as and for the purposes described.

2. The combination of a slide, B, and its operating crank-shaft with the clutch D E and pendulum-weight e^1, substantially as and for the purpose described.

3. The combination of a foot or hand lever, a clutch, D E, shaft C, and pendulum e^1, whereby the oscillations of the pendulum are converted into revolutions of a punching or shearing shaft, substantially as described.

4. The combination of the pendulum e^1, having a head, E, and arm e^2, connecting-rod G, lever H, and treadle J, having a pin, j', substantially as and for the purpose set forth.

JOSEPH T. BEDFORD.

In presence of—
JOHN STEVENSON,
ERNST TOPP.