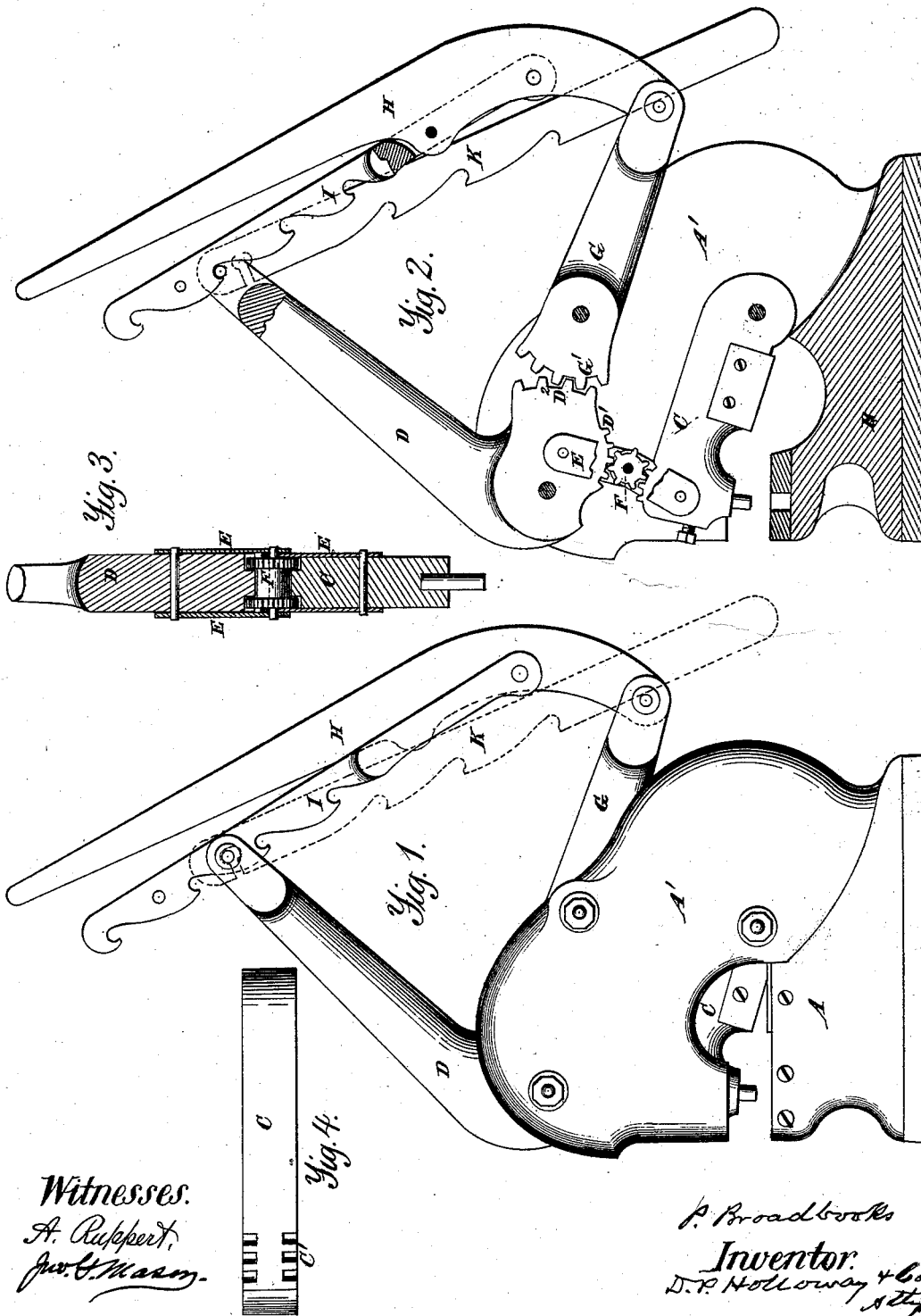


P. BROADBOOKS.  
Mechanical Movement.

No. 203,111.

Patented April 30, 1878.



Witnesses.  
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# UNITED STATES PATENT OFFICE.

PETER BROADBOOKS, OF BATAVIA, NEW YORK.

## IMPROVEMENT IN MECHANICAL MOVEMENTS.

Specification forming part of Letters Patent No. **203,111**, dated April 30, 1878; application filed March 8, 1877.

### *To all whom it may concern:*

Be it known that I, PETER BROADBOOKS, of Batavia, in the county of Genesee and State of New York, have invented a new and useful Improvement in Mechanical Movements, of which the following is a specification:

My invention relates to a combination of mechanism intended to develop great pressure, which I have illustrated as applied to a punching and shearing machine, but which may be applied to all manner of machines where great force of compression is required.

In the annexed drawings, making part of this specification, Figure 1 is a side elevation of the machine. Fig. 2 is a sectional elevation, the sides of the frame or casing being removed. Fig. 3 is a vertical transverse section through the upper jaw, pinion, and lever; and Fig. 4 is a plan of the top of the upper jaw.

The same letters are employed in all the figures for the indication of identical parts.

A A' are the side or frame pieces, through which the bolts pass which serve as fulcra for the several levers. B is the anvil or stationary jaw. C is the movable jaw, swinging on a bolt, the jaws being fitted according to the work to be done. On top of the jaw C, at the free end, is a double set of teeth, with an intermediate plain surface, as clearly shown in Fig. 4.

D is a lever, on the short arm of which is an eccentric-head, having on the lower face of the cam a double series of cogs and an intermediate plain surface, corresponding to C'. This lever is connected to jaw C by jointed straps E, which serve to sustain the jaw and also support the pivot of the intermediate pinion F, which has a series of spur-teeth on each end, and an intermediate plain cylindrical surface, corresponding to and bearing against the plain surfaces C' D<sup>1</sup>, the teeth of the pinion engaging those on each side of the jaw and lever. At the inner end of the eccentric-head of the lever is an arc, which has teeth cut at D<sup>2</sup>, engaging the corresponding teeth on the segmental end of the lever G, which, like lever D, has its fulcrum on the side frame.

The pinion and plain cylindrical surface of the roller, instead of being cast in one piece, may be cast separately and hung together on a single shaft, which serves as an axis, upon which they can turn independently.

When the free ends of levers D and G are drawn toward one another, they act with their combined force upon the pinion F and jaw C, the pressure being applied to the plain surfaces, the teeth causing the pinion to be revolved toward the fulcrum of lever D, thus continually shortening the distance between the fulcrum of the lever and the resistance, and increasing the power of the lever as the long arm continues to descend. This movement of the long arms toward one another is accomplished by means of the lever H, pivoted to the end of lever G, and connected with the free end of lever D by means of a notched connecting-bar, I, having its notches formed to successively hook over a pin in the open end of the arm D. The lower end of bar I is attached to either of a series of holes in lever H, thereby permitting the regulation of the power and relative speed. Each movement of lever H draws down the free end of D so far that the notched bar I requires to be shifted a notch, which is done by raising lever H until another notch falls over the pin in the end of D. To hold the levers from re-acting while the lever H is being raised, a notched bar, K, having its hooked notches reversed, is hung on the outer end of the pin in the free end of D, and lies on the projecting pin, which forms a fulcrum for lever H.

If, instead of oscillating the upper jaw, it is to be moved equally at both ends, a second set of links, pinions, and cam-surfaces with the double cogs must be attached to lever G, and the pinions will be moved away from one another and toward their respective fulcra whenever the levers are drawn together, thus moving equally the two ends of the knife-plate, or whatever is intended to be operated.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In combination with the jaws C, having on the edges rows of cogs with an intermediate plain surface, and cam-headed lever D, having corresponding cogs and an intermediate plain surface, and jointed straps E, the roller F, having corresponding cogs on the ends, and an intermediate cylindrical smooth surface and bearings in the joint of the strap, substantially as and for the purpose set forth.

2. In combination with the parts C, F, and

D, the lever G, having gearing connecting it with lever D at G' D<sup>1</sup>, so that when the ends of levers G and D are drawn together they shall act with their combined force on the pinion, substantially as set forth.

3. In combination with the interengaged levers G and D, the lever H and hook-notched bar I, arranged to operate substantially as set forth.

4. In combination with the levers D, G, and H and bar I, the notched bar K, arranged to operate substantially as set forth.

5. In combination with the jaw C and lever D, the pinion F, having between the series of cogs a plain cylindrical surface, on which it rolls, bearing upon corresponding surfaces of the lever and jaw, substantially as set forth.

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

PETER BROADBOOKS.

Witnesses:

N. K. CONE,

F. W. NORTON.