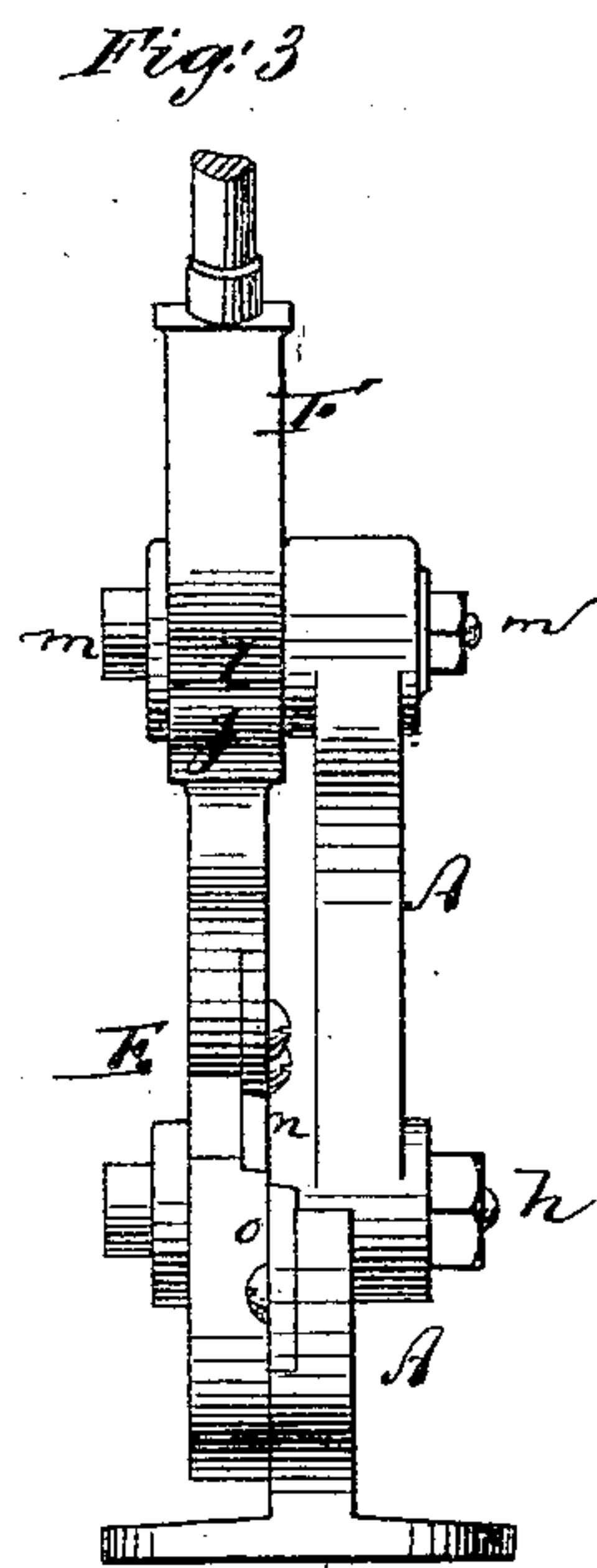
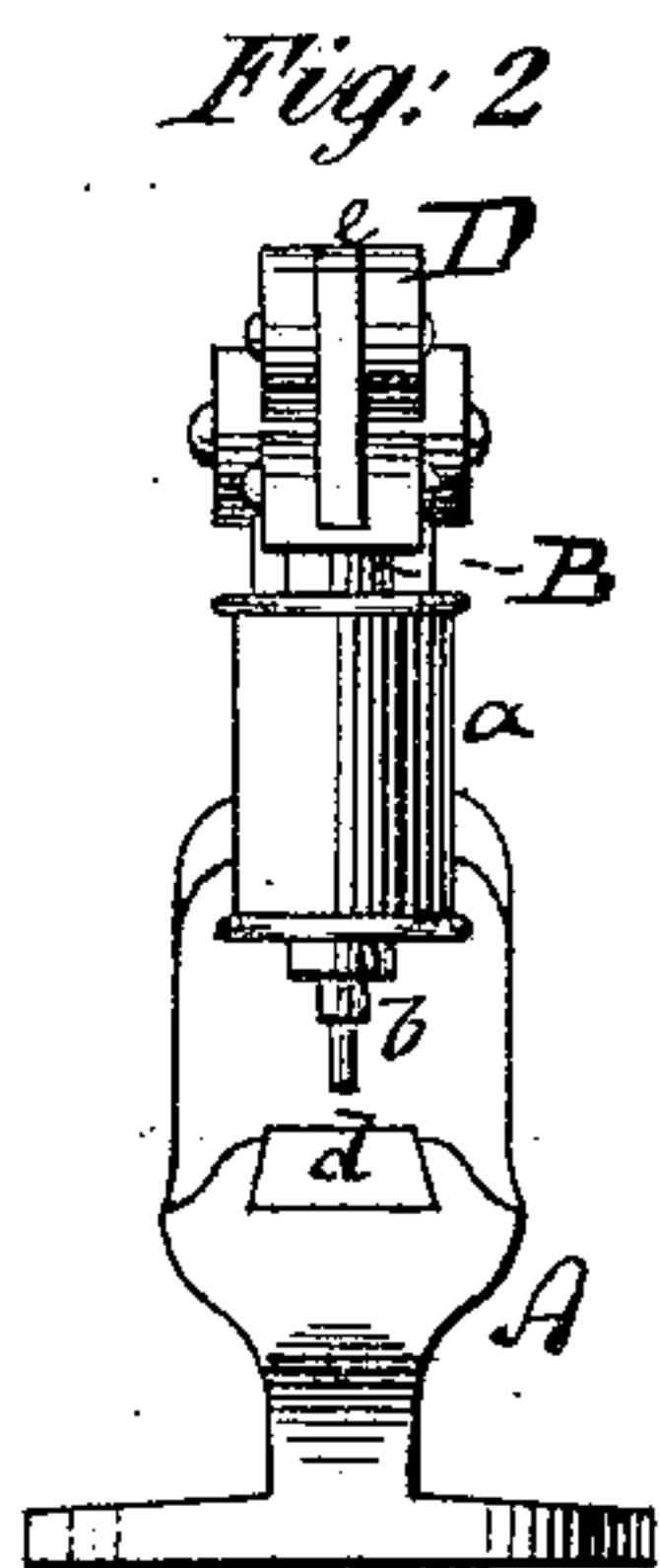
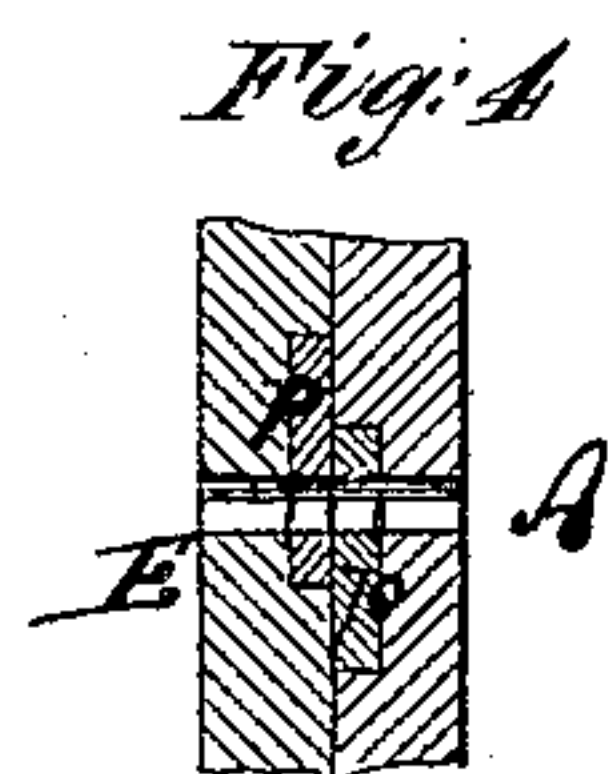
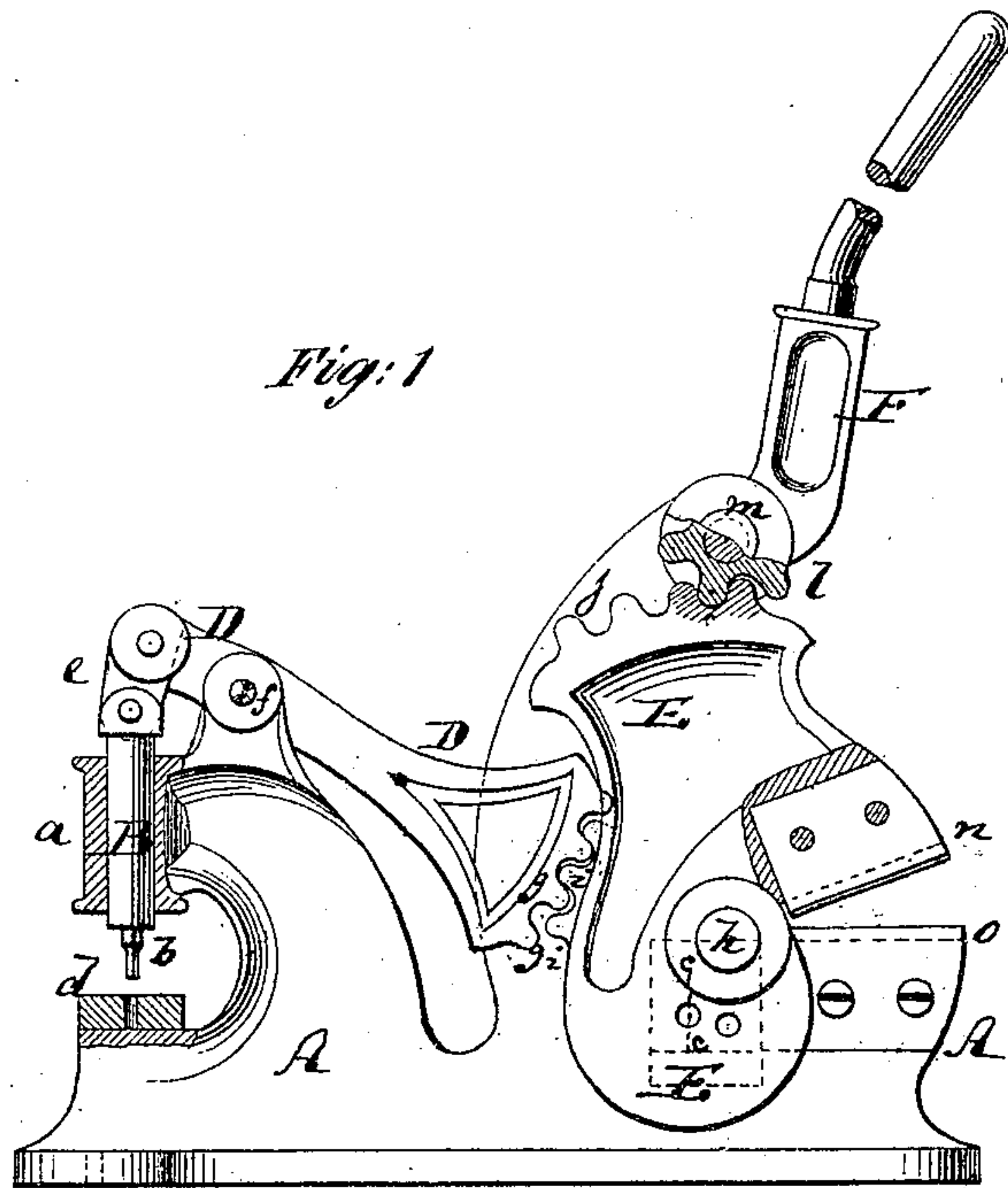


W. LYON.

Combined Punching and Shearing Machines.

No. 142,926.

Patented September 16, 1873.



Witnesses:
Fred Hayner
Jacob Smith

Warren Lyon
per Brown & Allen
Attorneys.

UNITED STATES PATENT OFFICE.

WARREN LYON, OF MAMARONECK, ASSIGNOR TO THE BIDDLE MANUFACTURING COMPANY, OF NEW YORK, N. Y.

IMPROVEMENT IN COMBINED PUNCHING AND SHEARING MACHINES.

Specification forming part of Letters Patent No. **142,926**, dated September 16, 1873; application filed March 24, 1873.

To all whom it may concern:

Be it known that I, WARREN LYON, of Mamaroneck, in the county of Westchester and State of New York, have invented a Combined Punch and Shears, of which the following is a specification:

Figure 1 is a side elevation of my improved combined punch and shears; Fig. 2, an elevation of one end of the same, showing the punch. Fig. 3 is an elevation of the other end, showing the shears. Fig. 4 is a detail vertical section on the line C C, Fig. 1, showing the wire-cutting shears.

Similar letters of reference indicate corresponding parts.

This invention has for its object to combine in one machine instruments for punching metal, for cutting bars or plates of metal, and also for cutting wire, all at one operation, if desired; and the invention consists in such a new arrangement of levers for imparting motion to the several cutting and punching tools that they will all be operated simultaneously, even if not required to work, so that thus either one of the three operations—to wit, that of punching, of bar or plate cutting, and of wire-cutting—may be carried on separately or together, as may be desired. The several levers are connected with each other by toothed segments, thereby to transmit motion from one to the other, in manner hereinafter more fully described.

In the accompanying drawing, the letter A represents the frame or stationary support of my combined punching and shearing machine. The same is made of metal, or other material of sufficient strength, and of such shape as to be best adapted to the operations of the machine. B is an upright slide or rod, fitted through a tubular guide, *a*, which is formed at one end of the frame A. The lower end of the slide B carries a punch, *b*. Below the punch is secured, in a dovetail or other shaped mortise of the frame A, a die, *d*, as is more clearly shown in Fig. 2. This die may be removed and replaced at will, as can also the punch be removed or replaced from or on the rod B. The upper end of the rod B is, by a link, *e*, connected with a lever, D, which is

at *f* pivoted to the standard of the frame A, on which the tube *a* is formed, as is clearly shown in Fig. 1. One end of the lever D is connected with the link *e*, as described, while its other end carries a toothed segment, *g*, which is in gear with a lever, E, that is at *h* pivoted to the side of the frame A. The lever E carries a toothed segment, *i*, in gear with the segment *g* of the lever D. At the upper portion of the lever E is formed another toothed segment, *j*, which is in gear with a toothed segment, *l*, formed on a lever, F, that is at *m* pivoted to the upper part of the frame A. A cutting-blade, *n*, is fastened to one side of the lever E, and passes, when said lever is vibrated on its pivot, along a similar cutting-blade, *o*, which is fastened to the side of the frame A. Thus, whenever the lever F is swung on its pivot, the levers E and D will be vibrated simultaneously to operate the punch *b* and the cutting-blade *n* of the shears *n o* at one and the same time. The lower or any other part of the lever E is perforated in line with a similar perforation or perforations through the upright part of the frame A, and similarly perforated cutting-plates *p p* are secured on the contiguous perforated surfaces of such lever E and frame A, as is more clearly shown in Fig. 4.

Whenever a wire or rod is to be cut, it is put through the perforations of the lever E and frame A while the same are in line with each other, and the lever, being then swung, carries its blade *p* along the similar blade *p* of the frame, and serves thereby to cut said wire.

The three processes hereinabove mentioned can thus be carried on at once, or separately when desired.

I claim—

The combination of the levers D, E, and F with the punch B, shears *n o*, and rod-cutters *p p*, for simultaneous operation, substantially as specified.

WARREN LYON.

Witnesses:

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