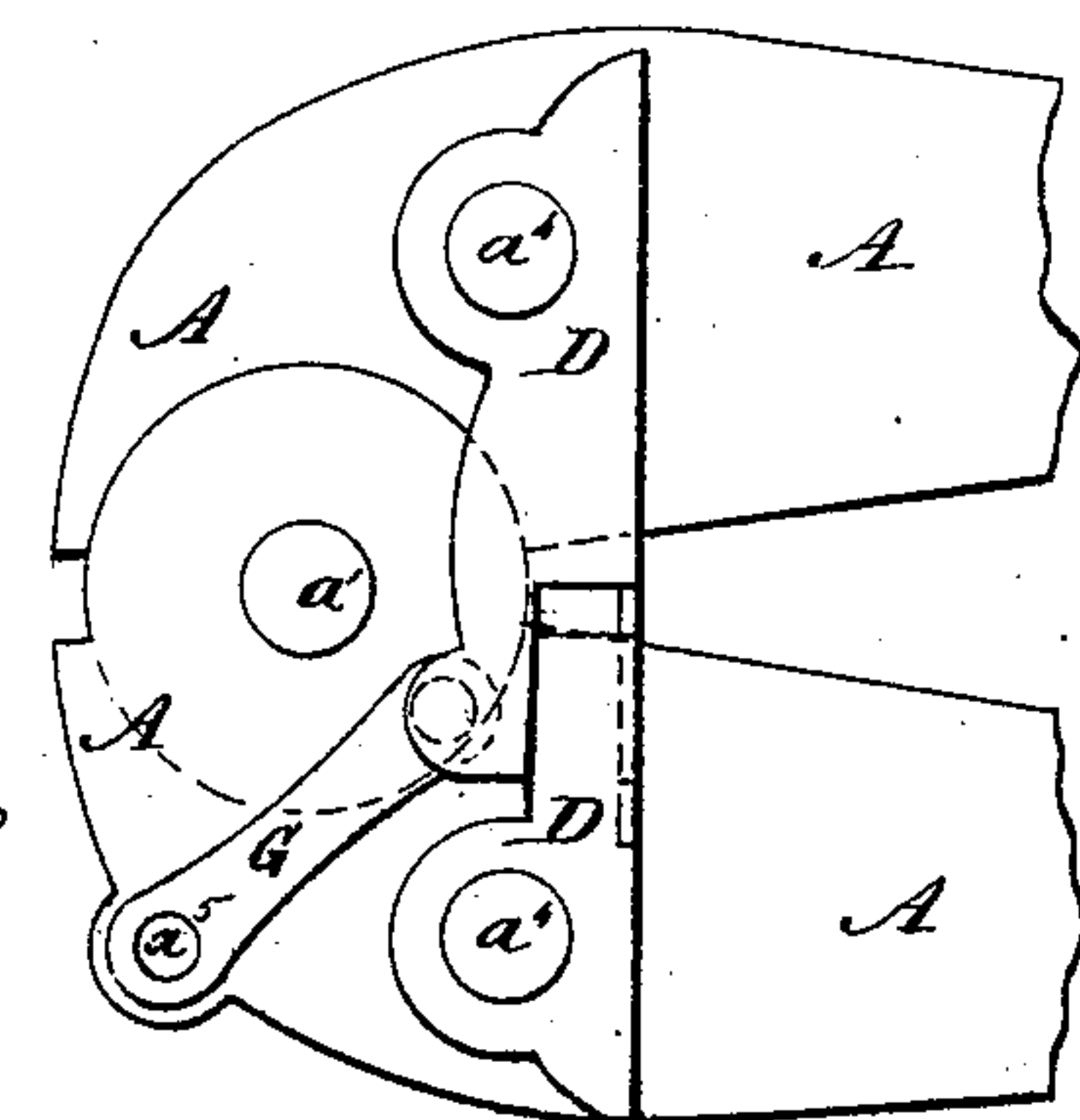
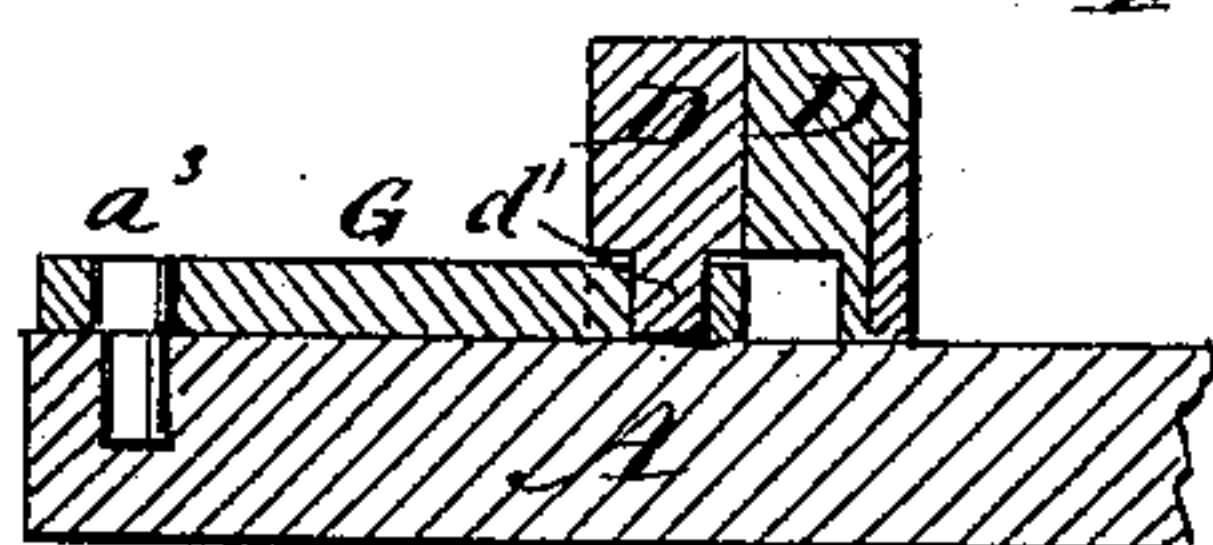
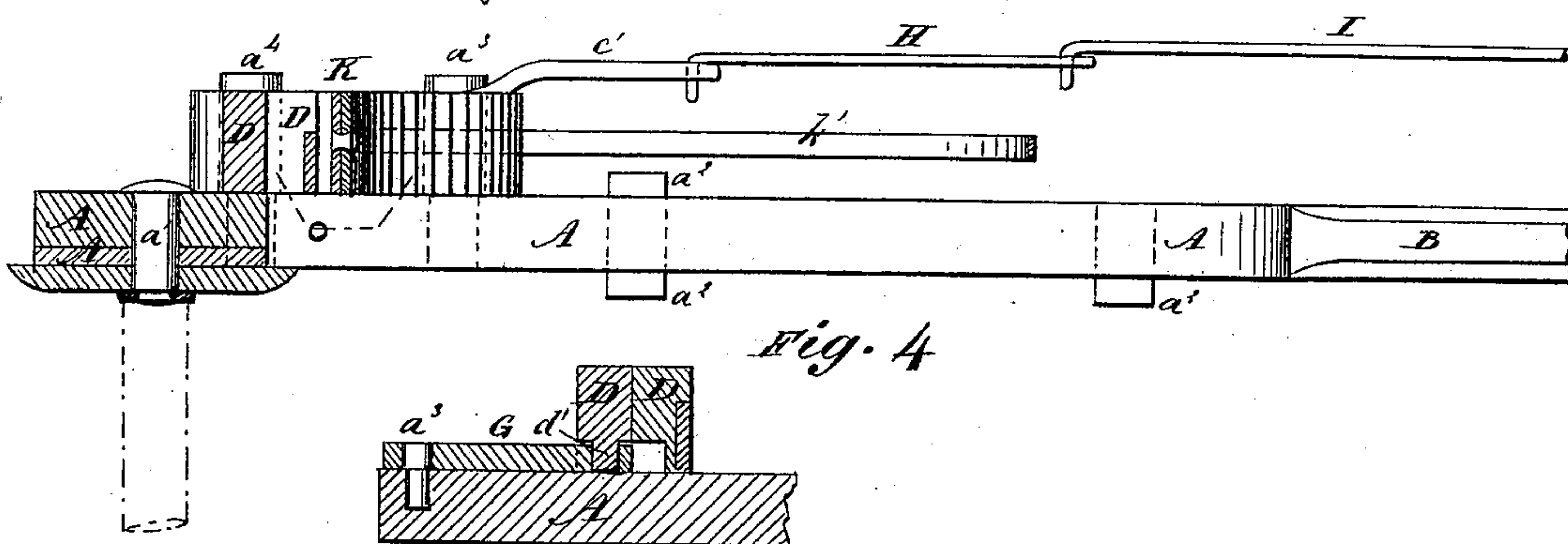
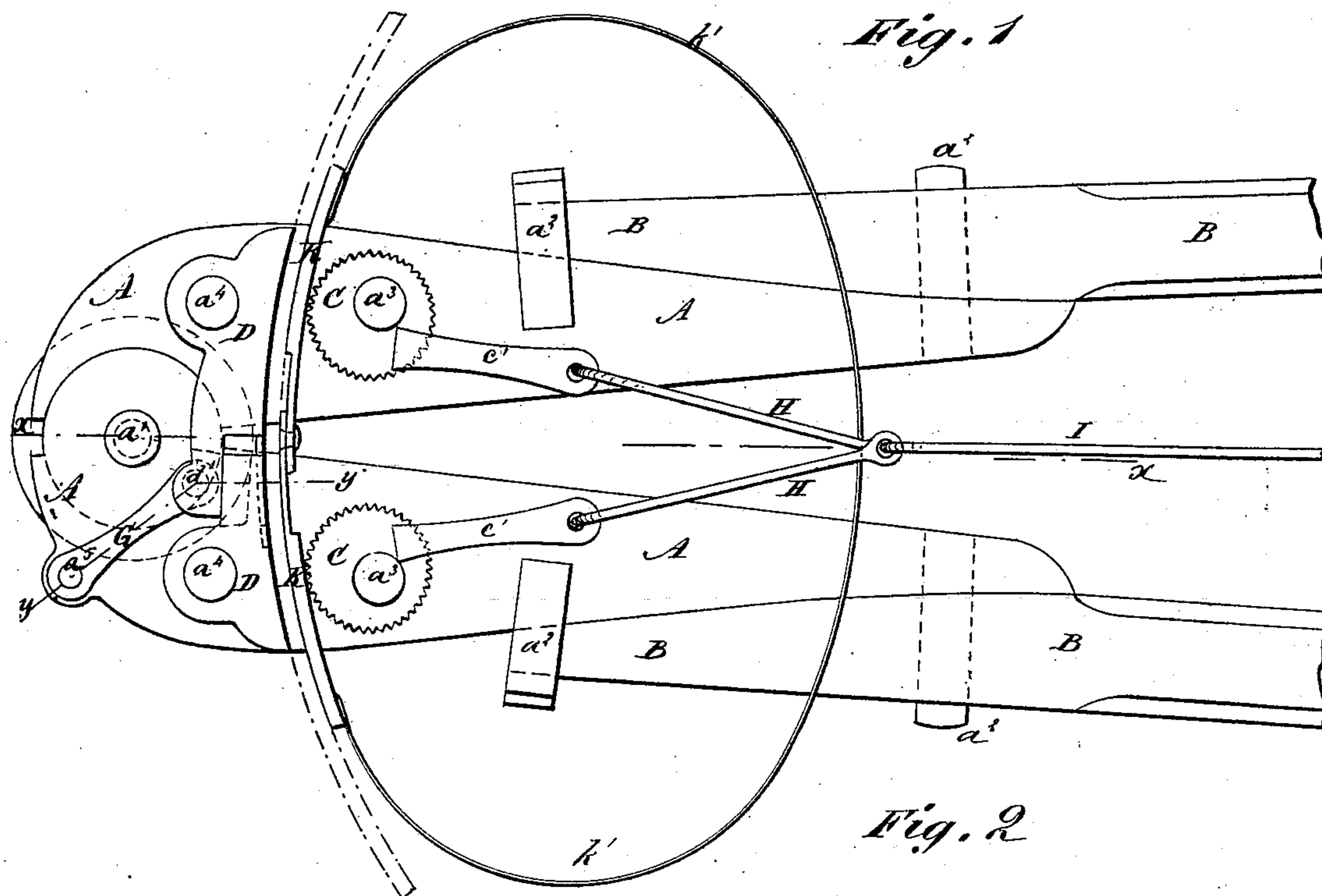


G. W. FORD.  
Machine for Expanding and Contracting Metal.  
No. 201,403.      Patented March 19, 1878.



WITNESSES:  
C. Nereux  
C. Sedgwick

INVENTOR:  
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ATTORNEYS.

# UNITED STATES PATENT OFFICE.

GEORGE W. FORD, OF ELBA, NEW YORK.

## IMPROVEMENT IN MACHINES FOR EXPANDING AND CONTRACTING METAL.

Specification forming part of Letters Patent No. **201,403**, dated March 19, 1878; application filed January 16, 1878.

*To all whom it may concern:*

Be it known that I, GEORGE W. FORD, of Elba, in the county of Genesee and State of New York, have invented a new and useful Improvement in Machines for Contracting and Expanding Metals, of which the following is a specification:

Figure 1 is a top view of my improved machine arranged for operating upon tires. Fig. 2 is a longitudinal section of the same, taken through the line *x x*, Fig. 1. Fig. 3 is a top view of the forward part of the same arranged for operating upon straight bars. Fig. 4 is a detail section taken through the line *y y*, Fig. 1.

Similar letters of reference indicate corresponding parts.

The object of this invention is to furnish an improved machine for contracting and expanding tires, bars, and other iron articles, and which shall be simple in construction and convenient and effective in use.

The invention consists in the combination of the exchangeable pivoted blocks and the exchangeable pivoted eccentric or cam wheels, provided with the arms, and the rods, with the hinged levers, provided with the handles; in the combination of the pivoted guide-bar with the pivoted blocks and the hinged levers; in the combination of the plates and their spring with the eccentric or cam wheels, the blocks, and the hinged levers, as hereinafter fully described.

A are two levers, which are hinged to each other at or near their forward ends by a bolt, *a*<sup>1</sup>. The bolt *a*<sup>1</sup> may extend down into a low bench, upon which the machine may be placed when being used, to keep the said machine in place.

Upon the end parts of the levers A are formed sockets *a*<sup>2</sup>, to receive the handles B, by which the machine is operated.

To the levers A, at a little distance from their hinged ends, are attached pivots *a*<sup>3</sup>, upon which are placed eccentric-wheels *c*, the faces of which are toothed, to cause them to grasp the iron to be operated upon.

To the eccentric or cam wheels *c* are rigidly

attached arms or levers *c'*, to the ends of which are pivoted the ends of two rods, H. The other ends of the rods H are pivoted to the end of a rod, I, which extends back into such a position that it may be conveniently reached and operated by the man who operates the handles B.

The eccentric-wheels *c* are shown in Fig. 1 in position for contracting tires or other articles, and should be exchanged when the machine is to be used for expanding them.

D are the blocks against which the iron is clamped by the wheels *c* to be operated upon, and which are placed upon pivots *a*<sup>4</sup>, attached to the levers A, so that the said blocks can be exchanged when required. The blocks D are made with curved or concaved faces, as shown in Fig. 1, when they are to be used for upsetting or contracting tires or other curved bars, and with straight faces, as shown in Fig. 3, when they are to be used for upsetting or contracting straight bars; and when the blocks D are to be used for upsetting or contracting curved or straight bars, their inner ends may be halved or tongued and grooved to each other, to keep them in place; and they may be further kept in place by guide-bar G, one end of which is placed upon a pivot, *d'*, attached to one of the said jaws D, and the other end of which is placed upon a pivot, *a*<sup>5</sup>, attached to one of the levers A.

K are two plates, the inner ends of which overlap and are halved to each other, and are connected by a rivet attached to one end, and passing through a slot in the other end. To the outer ends of the plates K are attached the ends of a curved spring, *k'*, to keep them spread apart in position for use.

The plates K are designed for use in upsetting light tire, to keep it from kinking, and are interposed between the said tire and the cam-wheels C.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination of the exchangeable pivoted blocks D and the exchangeable pivoted eccentric or cam wheels C, provided with the



arms  $c'$ , and the rods H I, with the hinged levers A, provided with the handles B, substantially as herein shown and described.

2. The combination of the pivoted guide-bar G with the pivoted blocks D and the hinged levers A, substantially as herein shown and described.

3. The combination of the plates K and

their spring  $k'$  with the eccentric or cam wheels C, the blocks D, and the hinged levers A, substantially as herein shown and described.

GEORGE W. FORD.

Witnesses:

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