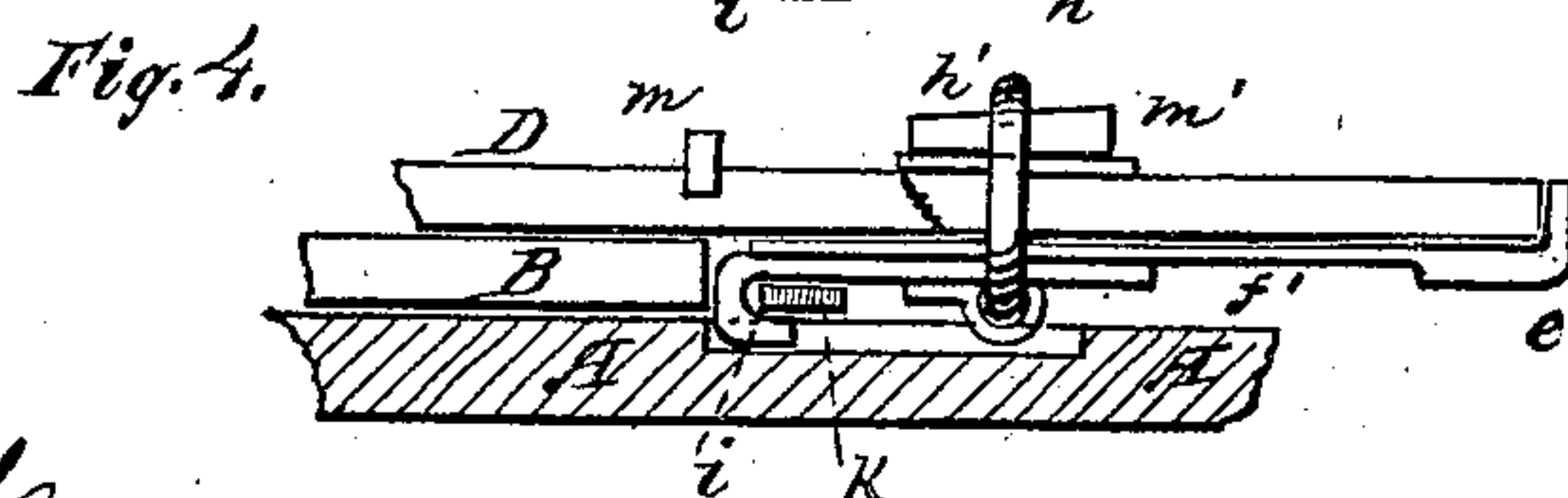
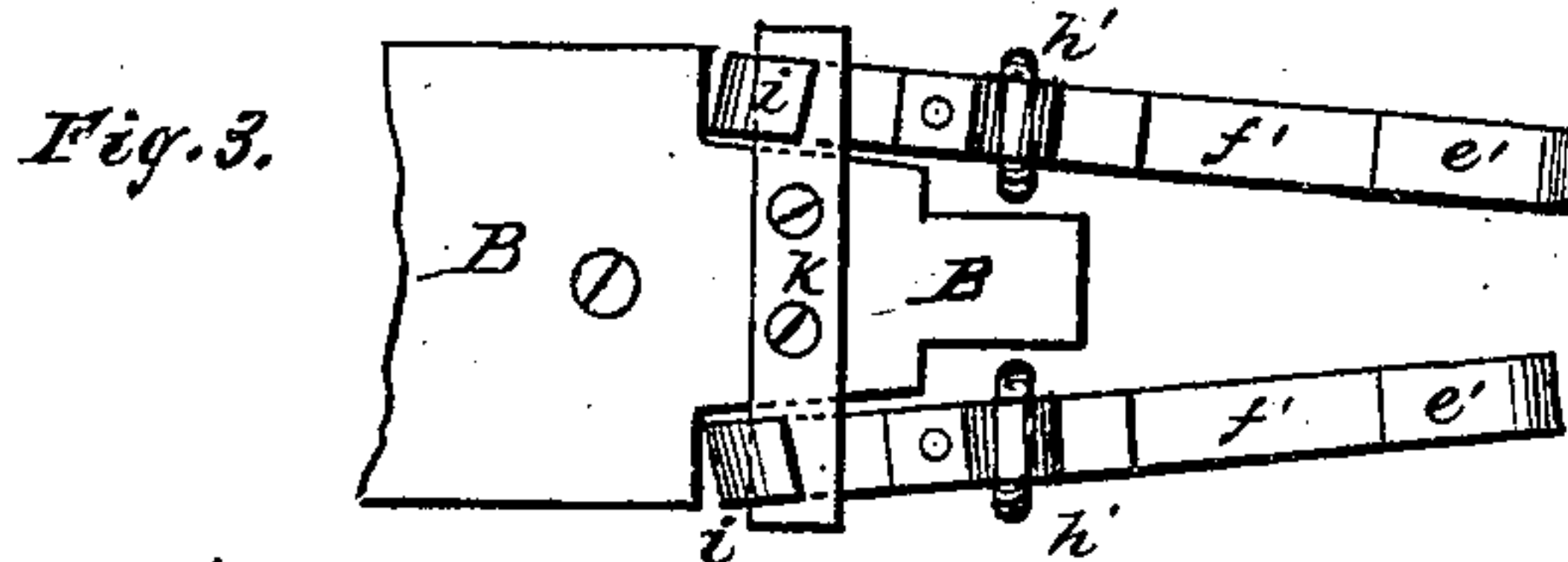
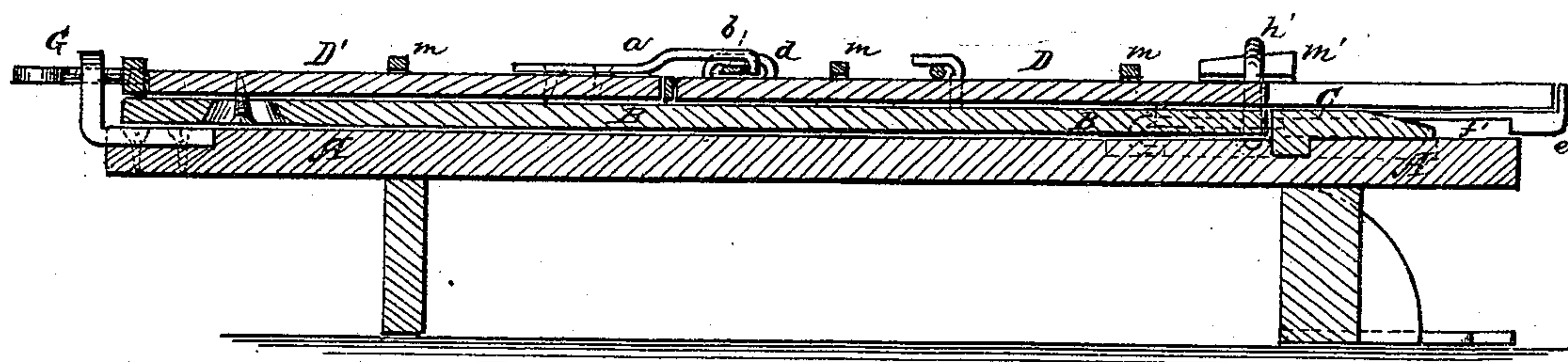
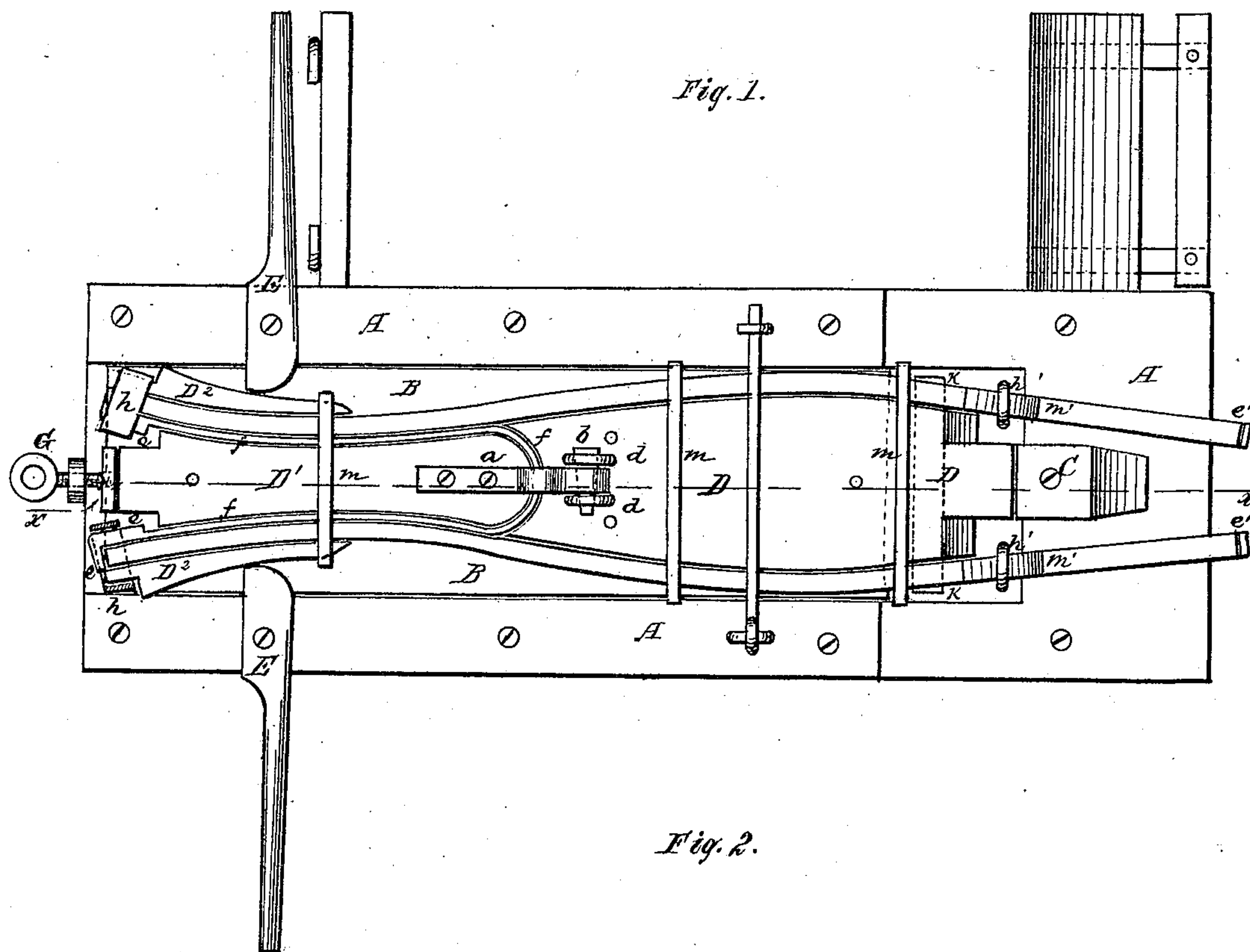


**A. G. SNYDER.**  
**Machines for Bending Shafts.**

No. 148,519.

Patented March 10, 1874.



WITNESSES.  
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G. Stiecker.

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per J. H. Alexander  
ATTORNEY.

# UNITED STATES PATENT OFFICE.

ANDREW G. SNYDER, OF ASHTABULA, OHIO.

## IMPROVEMENT IN MACHINES FOR BENDING SHAFTS.

Specification forming part of Letters Patent No. 148,519, dated March 10, 1874; application filed February 19, 1874.

*To all whom it may concern:*

Be it known that I, A. G. SNYDER, of Ashtabula, in the county of Ashtabula and State of Ohio, have invented certain new and useful Improvements in Machines for Bending Shafts; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings and to the letters of reference marked thereon, which form part of this specification.

The nature of my invention consists in the construction and arrangement of a machine for bending shafts, as will be hereinafter more fully set forth.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawing, in which—

Figure 1 is a plan view, and Fig. 2 a longitudinal section, of my machine. Figs. 3 and 4 are detailed views of parts of the same.

A represents the bed of my machine, in which is a recess for the reception of the plate B. One end of this plate abuts against an abutment, C, as shown. On the upper surface of the plate B is secured the stationary center-former D, to which is connected the adjustable or movable center-former D<sup>1</sup>, by means of a hook, *a*, permanently attached to the latter, and held by a key, *b*, in or between staples *d d* on the stationary former. This connecting device is used to hold or retain the end pressure. The formers D and D<sup>1</sup> are constructed substantially in the shape shown in the drawing, so as to bend both right and left shafts at the same time. Around the movable former D is a metal strap, *f*, provided at its ends with abutments *e e*, against which one end of each piece of timber to be bent is placed. Outside of the pieces of timber are placed short formers D<sup>2</sup> D<sup>2</sup>, for making the outside tip bend, the whole being held together by means of straps *h h*. The short outside tip-formers D<sup>2</sup> D<sup>2</sup> are operated upon by cam-levers E E, pivoted on

the bed A. The other ends of the pieces of timber to be bent are placed against abutments *e' e'* on heel-straps *f' f'*, the front ends of which form hooks *i i*, to be fastened on a cross-bar, *k*, attached to the under side of the plate B. Each heel-strap *f'* is provided with a strap, *h'*, passing over the timber, and through the same is passed a wood key, *m'*, to hold the timber to the strap.

The heel-straps *f' f'* may be curved or bent upward, more or less, according as it is desired to have the rear or heel ends of the shafts bent more or less.

The pieces of timber being placed in position, the movable center-former D<sup>1</sup> is forced inwardly by means of a set-screw, G, and the levers E E applied on the outside of the short formers D<sup>2</sup>.

Clamps *m m* are placed across the center and outside formers and the timbers, to hold the same together. When the desired pressure is obtained, the key *b* is inserted, to hold the hook *a*, and thus retain the pressure.

It will be noticed that all the bending is made by commencing at the ends and bending toward the center, making the shafts more solid and stronger than where they are bent from the center toward the ends.

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

The combination of the formers D D<sup>1</sup> D<sup>2</sup>, straps *f f'*, abutments *e e'*, and the fastening devices herein described, for bending right and left shafts at the same time, by commencing at the ends and bending toward the center, substantially as and for the purposes herein set forth.

In testimony that I claim the foregoing as my own, I affix my signature in presence of two witnesses.

A. G. SNYDER.

Witnesses:

C. S. ROBERTSON,  
I. O. FISHER.