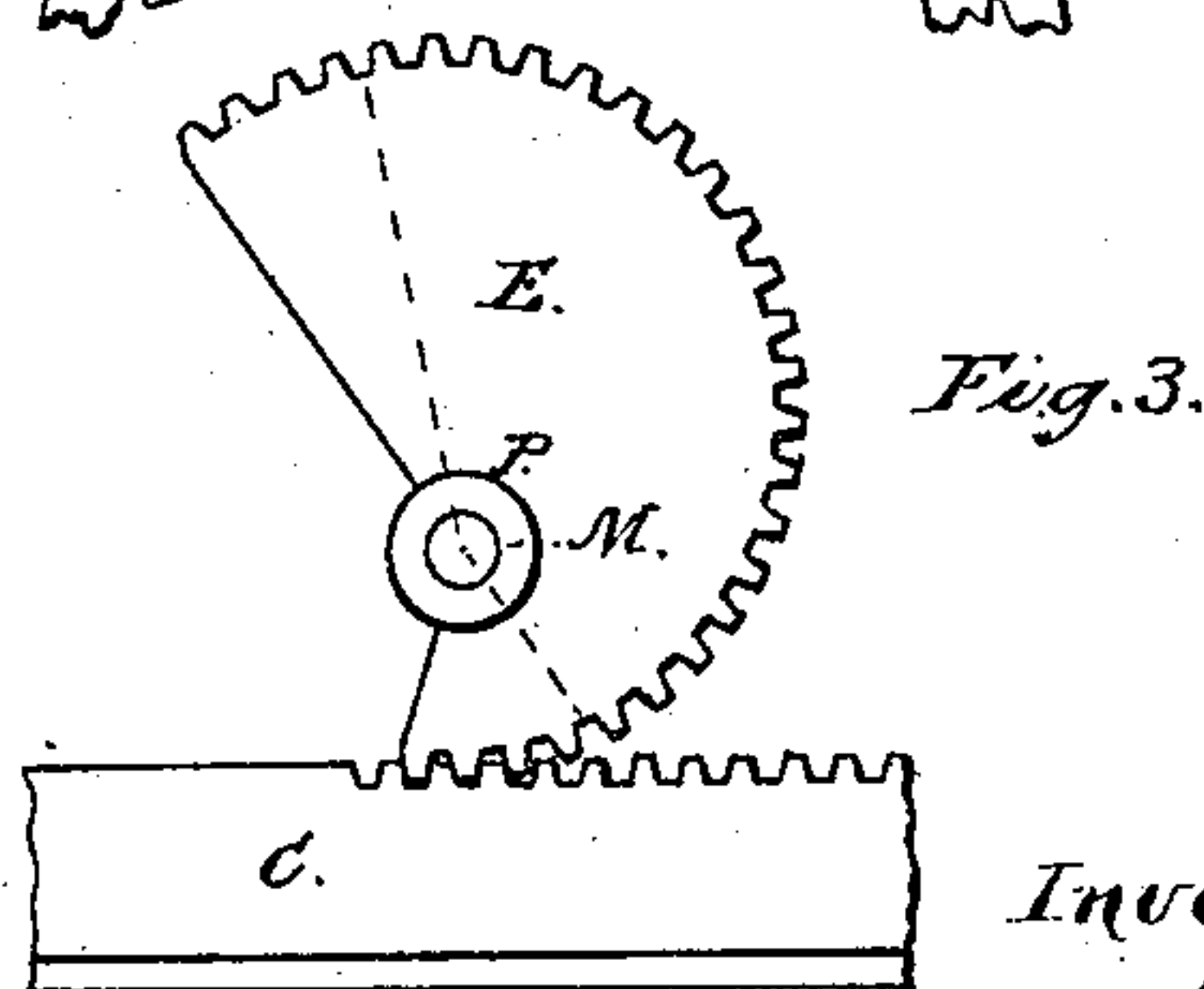
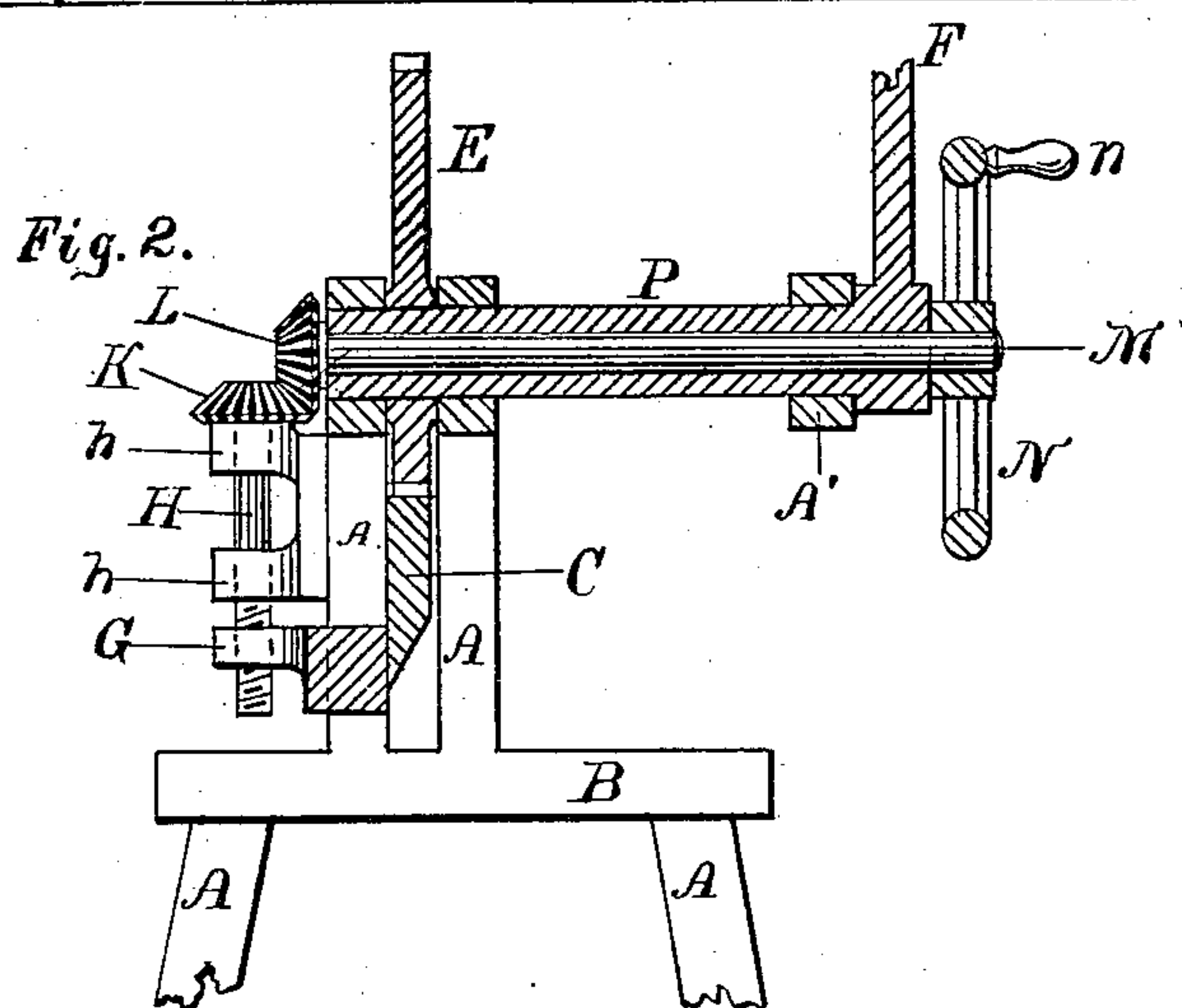
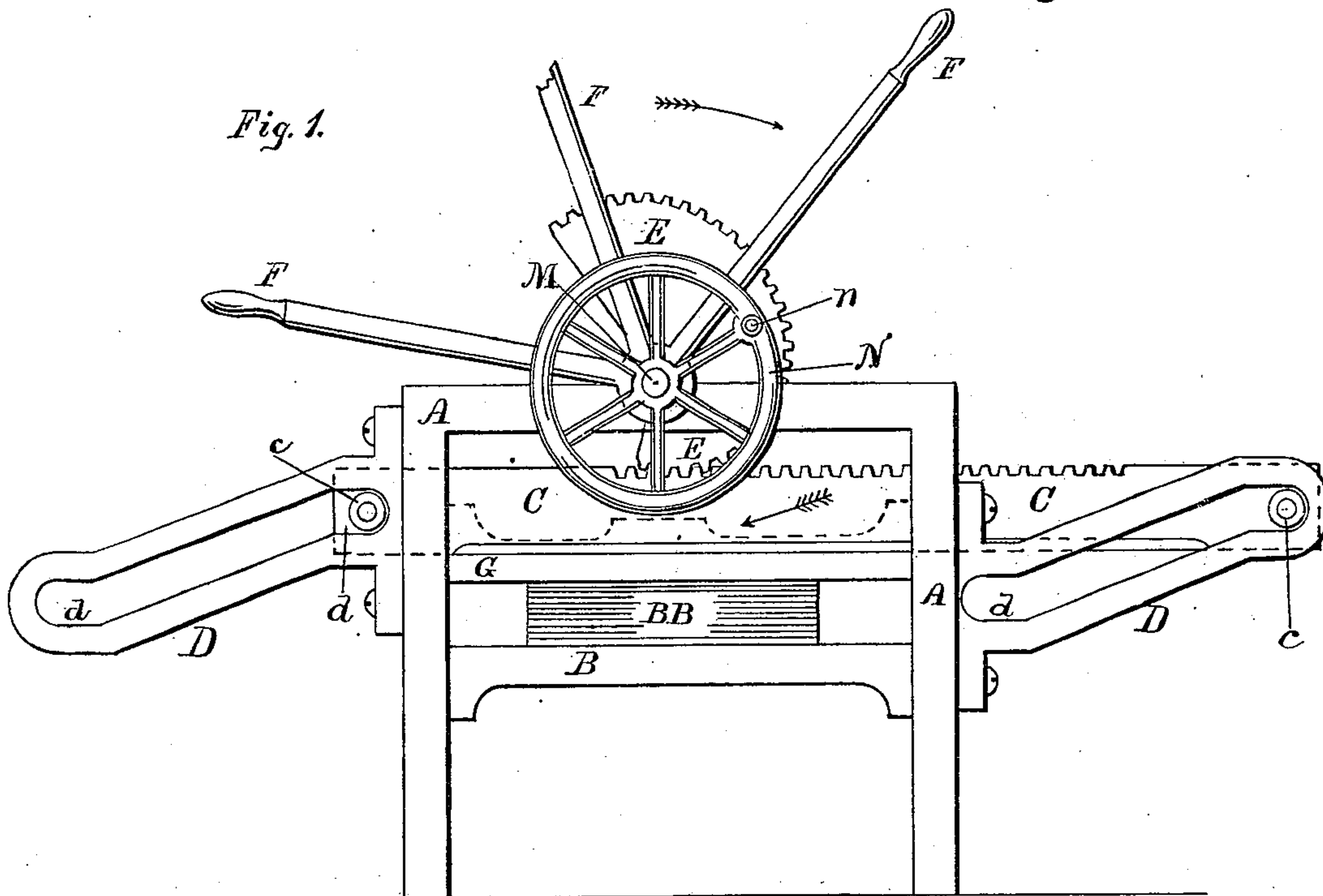


(No Model.)

J. WALKER.
PAPER CUTTING MACHINE.

No. 245,330.

Patented Aug. 9, 1881.



Witnesses:

Oscar & Ferrigo
Fred D. Ginn

Inventor:

Joseph Walker

UNITED STATES PATENT OFFICE.

JOSEPH WALKER, OF MANCHESTER, VIRGINIA.

PAPER-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 245,330, dated August 9, 1881.

Application filed January 19, 1881. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH WALKER, a citizen of the United States, residing at Manchester, in the county of Chesterfield and State of Virginia, have invented a new and useful Paper-Cutting Machine for the use of Printers, Book-Binders, and Others, of which the following is a specification.

My invention relates to paper-cutting machines operated by hand, as per annexed drawings, or by power, without changing the essential features of the invention.

The objects of my improvements are, first, to give the knife a positive endwise motion at the same time that it moves downward to make the cut; second, to reduce the power required to operate it to its minimum; third, to reduce the friction consequent upon many wearing parts, and the great strain usually necessary in such machines; fourth, to provide a positive and convenient clamping device for holding the paper while it is being cut. I attain these important objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a front elevation of my machine; Fig. 2, a vertical cross-section of a portion of the machine, showing details of the clamping device, and Fig. 3 a view, in detail, of the toothed involute E.

Similar letters refer to similar parts in the several views.

A A is a strong iron or wooden frame supporting the bed B upon which the paper to be cut is placed. The knife C is placed between the standards A A of the frame, and suspended at each end by the friction-rolls *c c*, running in grooves or slots in the guides D D.

Upon the back of the knife C is formed a series of teeth or cogs, which are engaged by the toothed involute E. This involute is in the form of a cam whose constantly increasing radii are accommodated by the inclination of the slots in the guides D D, which, by means of the friction-rolls *c c*, hold the cogs of the knife always engaged with those of the toothed involute E. A short distance of both the outer and inner ends of the involute is the arc of a circle whose center is the center of the shaft P on which the involute E is fixed, as shown by dotted lines in Fig. 3. The object of this

is to allow of a perfectly horizontal movement of the knife at the commencement and end of each cut, as shown by the short horizontal portion of the slots in the guides D D, as seen at *d d*. This is for the purpose of holding the knife in a secure position when raised, and preventing a shock when the knife cuts through the last sheet of paper in its descent.

The shaft P is mounted in the frame A, the outer end being supported by the bracket-bearing A' attached to the frame A. Fixed to the outer end of the shaft P are the handles F F F, by means of which the involute E is operated. The shaft P is hollow through its entire length, through which runs the shaft M, having on its back end the bevel-gear L, which engages the bevel-gear K fixed to the top of the shaft H, which is supported by the bearings *h h* fixed to the frame A. The lower portion of the shaft H is formed into a screw passing through a nut in the clamp G, which slides up and down upon the standards of the frame A A. Through the medium of the bevel-gears K L, shafts H M, and hand-wheel N the clamp G is raised and lowered at pleasure. The hand-wheel N is provided with a handle, *n*, by which it may be rapidly revolved when necessary. The clamp G is for the purpose of forcing the paper down into a compact mass preparatory to being cut.

The parts H *h h* K L are omitted in Fig. 1 to avoid obscuring the drawing.

The operation of my machine is as follows, viz: The paper B B to be cut is placed upon the bed B, and by means of the hand-wheel N, acting through the shaft M, bevel-gears K L, and shaft H the clamp G is forced down upon it. The handles F F F are now moved in the direction of the arrow, revolving the toothed involute E, which, engaging the cogs of the knife C, forces it in the direction of the arrow on its face, the constantly increasing radii of the involute E, acting in concert with the inclined slots in the guides D D, forcing the knife forward and downward through the paper, making a clean smooth cut. The knife C in the drawings travels endwise six inches to every one inch downward, whereby an immense cutting capacity is acquired, or, if efficiency requires it, by enlarging the radii of the involute E, and lengthening to a corresponding degree the le-

vers F F F, an additional horizontal cutting force may be obtained with the same power, or less, by a decrease of the radii of the involute E and length of the levers F F F, if that change is found necessary and efficient. By means of this "draw-cut," as it is usually termed, the power required is very much reduced.

By the employment of the toothed involute E, acting directly upon the knife, the number of working and wearing parts is reduced to a minimum, as is also the power required to overcome the usual amount of friction in such machines.

Heretofore the knife of paper-cutting machines has usually been suspended by one or more short hangers or links, and pulled downward by various devices. In all these machines the knife has moved endwise only about the same distance as it moves down. In my machine it will be seen that the knife travels endwise six times as far as it does downward. This movement and the means by which it is obtained are new. By my method of acquiring the draw-cut I have also acquired a mobility of action which will reach the point of efficiency in cutting—that is, by enlarging or diminishing the radii of the toothed involute E, and by lengthening or shortening the levers F F F, I can acquire the best cutting capacity with the least power for the special and various uses of a paper-cutting machine.

By locating the hand-wheel N in front of the machine it is much more convenient than if

located, as usual, in a horizontal position at the top or at any other point, all of which greatly enhances the practical value of this machine.

Having now described my invention, I claim—

1. In a paper-cutting machine, the cutting-knife C, provided upon its back with a series of cogs, in combination with the toothed involute E, engaging directly with said cogs, and adapted to operate said knife, substantially as in the manner and for the purpose set forth.

2. In a paper-cutting machine, the cutting-knife C, provided upon its back with a series of cogs, and the toothed involute E, engaging directly with said cogs, in combination with the guides D, constructed and arranged so as to support the ends of said knife C, substantially as in the manner and for the purpose set forth.

3. In a paper-cutting machine, the combination, with the guides D and the cutting-knife C, supported at its ends by said guides, and provided upon its back with a series of cogs, of the toothed involute E, engaging directly with said cogs, hollow-shaft P, upon which said involute is mounted, and lever-handle F, provided at the end of said shaft, all constructed, arranged, and operating substantially as and for the purposes set forth.

JOSEPH WALKER.

Witnesses:

OSCAR E. PERRIGO,
FRED. D. GANN.