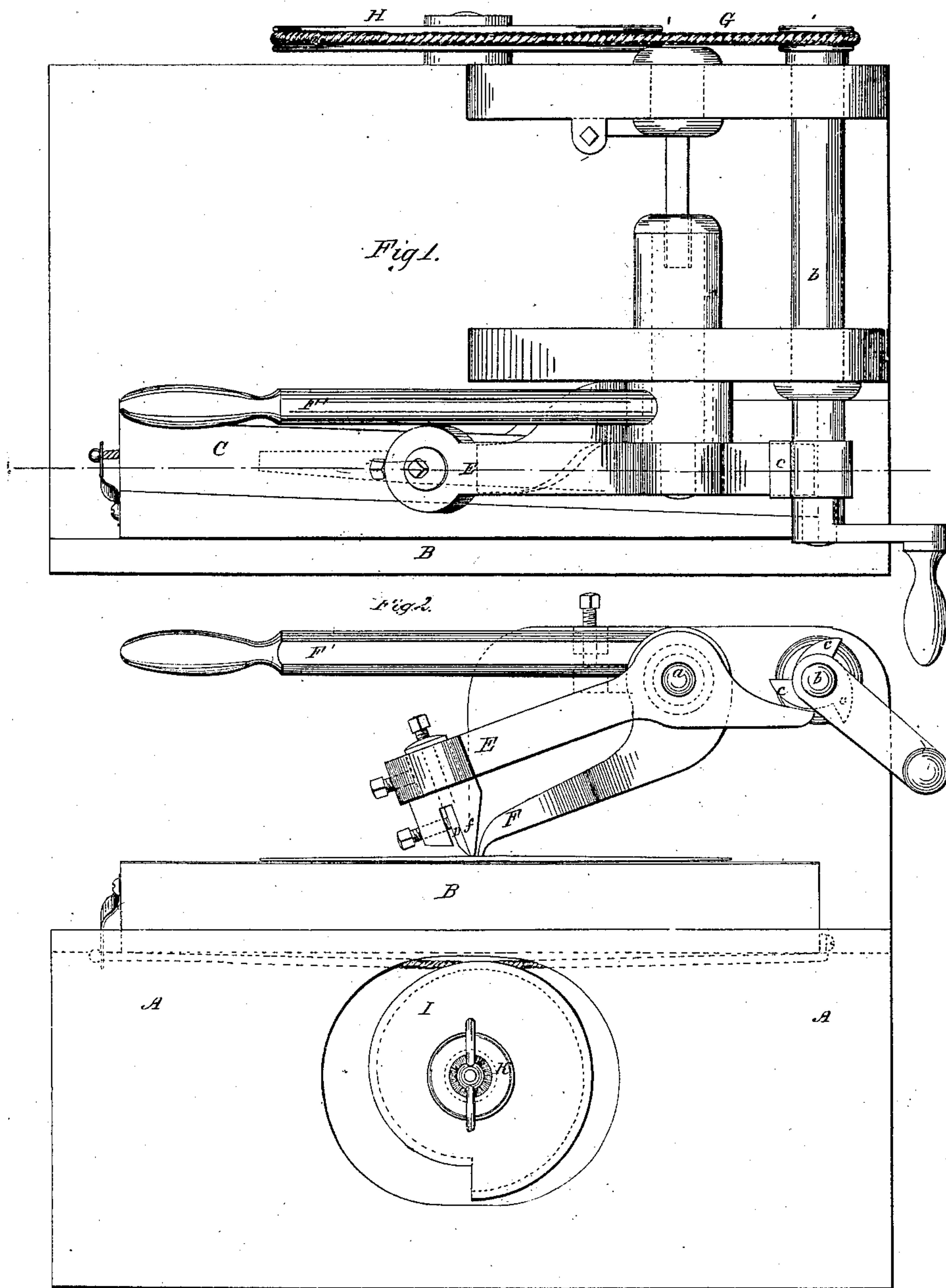


W. T. NICHOLSON.  
MACHINE FOR CUTTING FILES.

No. 78,681.

Patented June 9, 1868.



Witnesses.  
B. J. Thurston

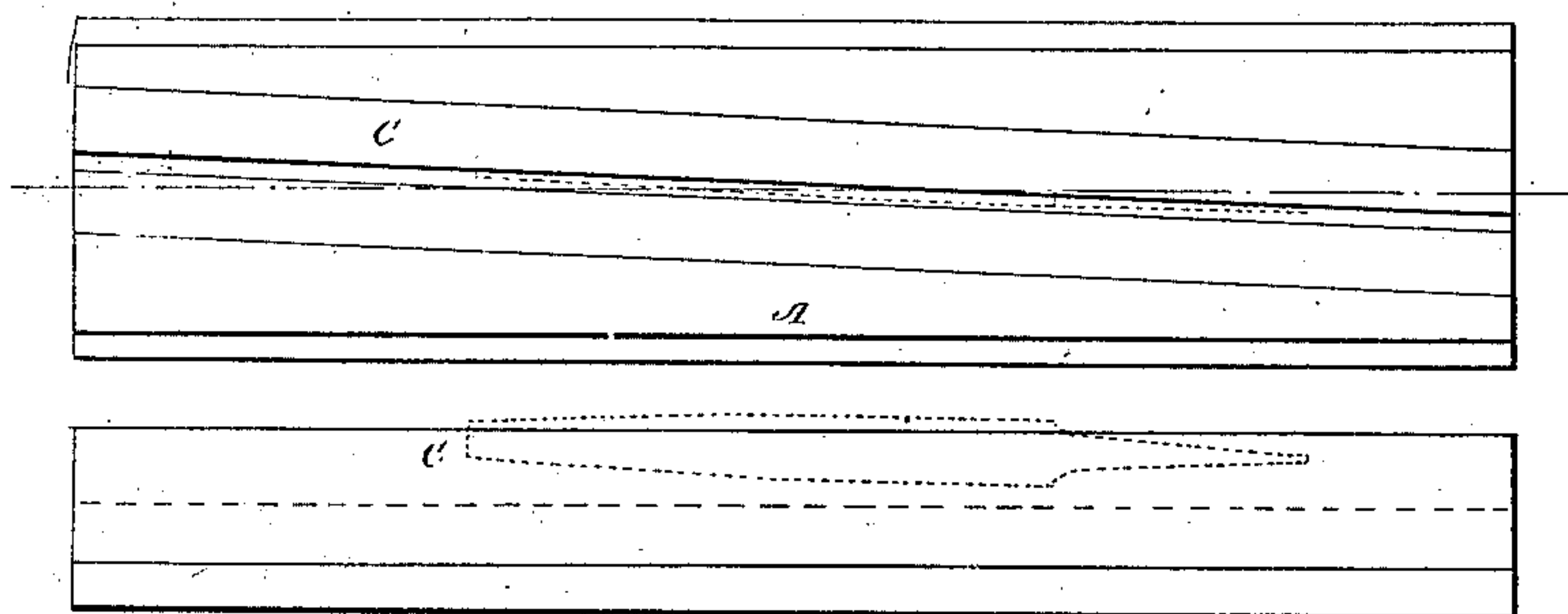
Inventor.  
W. T. Nicholson

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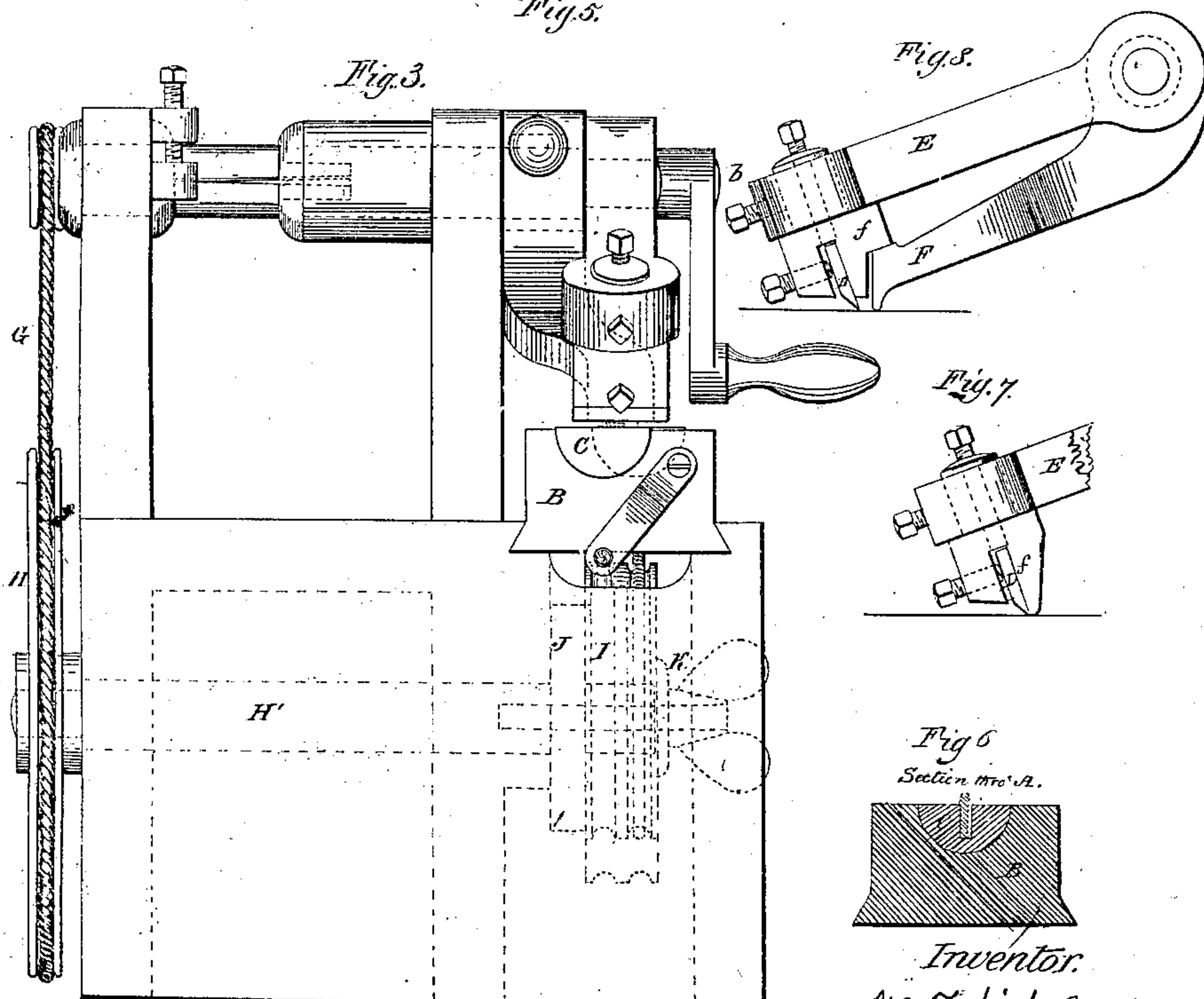
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Fig. 4.



*Fig. 5.*



Witnesses:  
 Bay F. Thurston.  
 Wm. M. Rickard.

Inventor:  
Wm. T. Nicholson



# United States Patent Office.

WILLIAM T. NICHOLSON, OF PROVIDENCE, RHODE ISLAND, ASSIGNOR TO  
THE NICHOLSON FILE COMPANY, OF THE SAME PLACE.

*Letters Patent No. 78,681, dated June 9, 1868; antedated June 5, 1868.*

## IMPROVED MACHINE FOR CUTTING FILES.

*The Schedule referred to in these Letters Patent and making part of the same.*

### TO ALL WHOM IT MAY CONCERN:

Be it known that I, WILLIAM T. NICHOLSON, of the city and county of Providence, in the State of Rhode Island, have invented certain new and useful Improvements in Machines for Cutting Files; and I do hereby declare that the following specification, taken in connection with the drawings making a part of the same, is a full, clear, and exact description thereof.

Sheet 1, Figure 1, is a top view of the machine.

Sheet 1, Figure 2, is a side view.

Sheet 2, Figure 3, is an end view.

Sheet 2, Figure 4, is a top view of the bed whereon the file-blank is placed while being cut.

Sheet 2, Figures 5, 6, 7, and 8 are detailed parts to be referred to.

In the accompanying drawings, A represents the frame upon which the various working parts are mounted, or to which they are attached.

B is the carriage, which travels under the cutter as the file is being cut, and carries a "rolling bed," C, fig. 6, upon which the file-blank rests, whose functions are described in the Letters Patent granted to John Crum, July 1, A. D. 1851.

D, fig. 2, is the cutting-chisel, which is set in a holder projecting from the helve E, whose fulcrum is at *a*. The proper revolution of the driving-shaft *b* causes the "wild-cat" *c* to act upon the helve E in a well-understood way, and lifts the chisel against the tension of a spring, the recoil of which, upon the release of the helve from the wild-cat, gives the necessary impulse to the chisel, to enable it to effect its work.

F is the presser for holding down the blank during the cutting operation, and for convenience there is attached to its axle a long handle, F', by means of which it can be lifted from the blank at pleasure, and upon which, if necessary, a weight may be hung, to regulate the degree of holding-force which the presser F shall exert.

The above-mentioned parts, and their mode of operation, do not require a more particular description, as the same are found in existing file-machines, and are familiar to those acquainted with the art of cutting files by machinery.

The present machine is particularly intended for cutting the faces of narrow and the backs of half-round files. For the purpose of avoiding the loss of time incidental to frequent grinding and resetting the chisel, I make use of a tool whose cutting-edge is much longer than the length of the cut which it is required to make, but make use, nevertheless, of the whole extent of the cutting-edge progressively during the process of cutting the blank from tip to heel. This is effected by setting the rolling bed C at an angle with the line of motion of the carriage B, as shown at fig. 4, whereby successive portions of the extended edge of the cutter are progressively brought into action as the blank is being cut. The advantage which thus results by economizing the time which would otherwise be consumed in regrinding and resetting a narrow chisel, is a consideration, in the practical operation of a file-factory, of much importance.

In the instance shown, the file-blank is fed along underneath the cutter, but the same arrangement of the rolling bed with reference to the main bed may be employed, and with equal advantage, in machines in which the bed is stationary and the cutting-chisel arranged to travel over the file.

The feeding-motion which should be given to the carriage to cause the file-blank to travel under the cutter, it will be found is in this instance a constant and not an intermittent one; the latter, however, may be employed, if preferred. A belt, G, passes from a pulley upon the driving-shaft around a pulley, H, connected with suitable mechanism for giving movement to the carriage, or the driving-shaft may be connected with the carriage-mechanism by a train of gears. The bed and its moving-mechanism can be connected or disconnected at pleasure, notwithstanding that such mechanism is in motion.

The transverse shaft H', driven by the pulley H, carries a double scroll-cam pulley, I, fig. 2, (and shown



in dotted lines in fig. 3,) fitting loosely upon it, and belts, or flexible metallic bands, are made fast to such pulley, and are attached to the ends of the carriage B, by means of which, when the scroll-cam pulley is revolved, the carriage will be made to traverse the bed upon which it is mounted.

Upon the shaft H' is a fixed plate or shoulder, J, (shown in dotted lines, fig. 3,) next to which the scroll-cam pulley I is placed, and upon the other side of such pulley, but attached to the shaft H', and accessible to the operator through an opening cut in the side of the frame A of the machine, is a clamp-nut, K, fig. 2. It is quite evident that when such clamp-nut is turned so as to hold fast the loose scroll-cam pulley between the face of the nut and the shoulder J, the necessary movement will be imparted to the carriage, but at other times the shaft H' may revolve independently of the scroll-cam.

It will be noticed that the action of the operator in raising the lever F', to relieve the blank from the influence of the "presser" F, will cause also the chisel to be lifted, and the helve E to be moved upon its fulcrum-pin, out of interference with the path of revolution of the tappet upon the wild-cat C. This arrangement, in combination with a continuously-revolving driving-shaft, effects a decided economy of time in operating the machine. The attendant, when a row of teeth upon the back of a half-round file has been cut, can with his left hand raise the lever F', and with his right hand unclamp the carriage and slide it back to position to commence a new row, then adjust the rolling bed to a new position upon its axis, when, upon reclamping the carriage and bringing down the presser, the machine instantly recommences its work.

A varying rate of feed can be obtained by so shaping the scroll-cam pulley I that the carriage shall travel faster at the points where it is desired to increase the width of the spaces between the teeth of the file, and move slowly at the points where the teeth are to be cut finer, the effect being the same upon the file as that described in the Letters Patent granted to me, April 5, A. D. 1864.

The last feature of improvement which the present machine exhibits, consists in a means for gauging the depth to which the chisel shall cut, and by the use of which no time may be lost in adjusting the force to be exerted by the spring which gives impulse to the chisel, but in all cases, irrespective of slight differences in the density of blanks of different grades of metal, the power to be exerted by the spring may be without close adjustment in excess of that required to cut the requisite depth of tooth. It consists simply in extending one side of the holder or socket for the chisel f, fig. 2, so that its edge striking upon the file-blank will form a stop, to prevent the chisel from entering the blank deeper than for the distance which such chisel projects beyond such stop. A modification of this device is shown at fig. 8, where, in place of extending the side of the socket, a projection from the same is arranged to strike upon the foot of the presser, and accomplish the same result as in the other case.

The machine above described has been constructed and arranged with especial reference to the accomplishment of the best results in manufacturing the class of files which it is adapted to cut with the greatest possible rapidity of execution. With this view, I, by preference, employ a constant instead of an intermittent feed-motion, which, when combined with a rolling bed, I have found to greatly increase the capacities of the machine in respect to rapidity of operation. The same end is also materially assisted by working the chisel with a helve instead of attaching it to a stock sliding between guides, and, in addition, from the fact that a chisel so hung moves in an arc whose radius is the helve, the teeth of files which are much curved can be properly cut upon such curved surface at an angle with the surface less apparently different from the angle of the teeth cut upon that portion of the file which is straight than if the chisel travelled in a right line.

I am aware that a chisel so hung has been before used with a fixed bed, but I am not aware that the same has before been used with a bed having an incidental rolling motion dependent upon the shape of the file-blank.

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

In a file-cutting machine, a "rolling bed," whose longitudinal axis is set angularly with the line of motion of the carriage, or of the cutting-chisel if the former be stationary and the latter movable, in combination with such cutting-chisel, substantially as described, for the purposes specified.

WM. T. NICHOLSON.

Witnesses:

BENJ. F. THURSTON,  
WM. W. RICKARD.