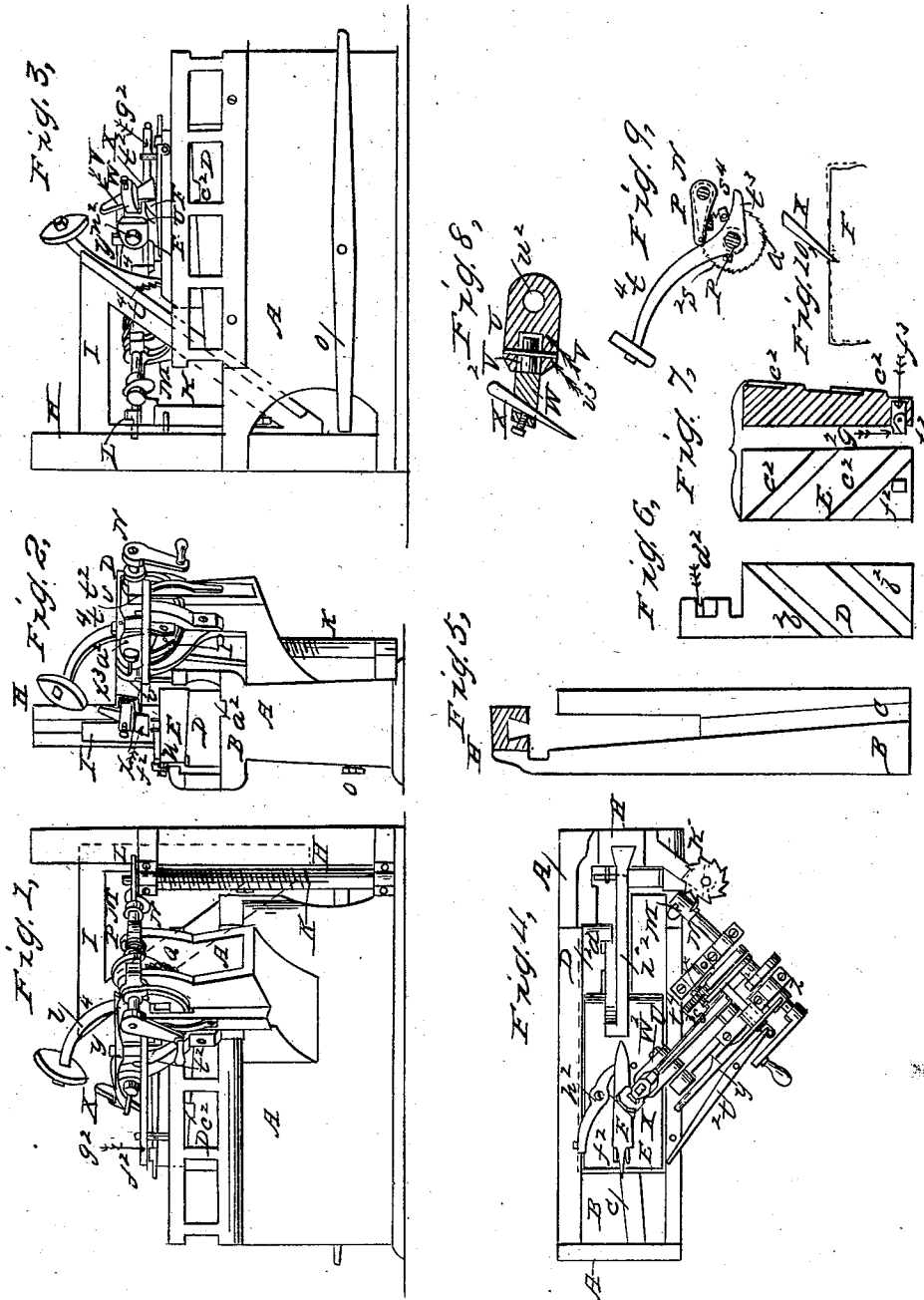


W. VAN ANDEN.

File Cutter.

No. 17,760.

Patented July 7, 1857.



# UNITED STATES PATENT OFFICE.

WM. VAN ANDEN, OF POUGHKEEPSIE, NEW YORK.

## FILE-CUTTING MACHINE.

Specification of Letters Patent No. 17,760, dated July 7, 1857.

*To all whom it may concern:*

Be it known that I, WILLIAM VAN ANDEN, of the city of Poughkeepsie, Dutchess county, State of New York, have invented certain new and useful Improvements in Machinery for Cutting Files; and I do hereby declare the following to be a full description of the same.

The nature of my invention consists in the mode of constructing and operating the bed on which the file blank is cut, so as to have a forward feed motion, and at the time of the blow of the hammer a slightly independent oblique or forward motion of the upper half of the compound bed or united bed, as the case may be, caused by the percussion of the hammer on the chisel in upsetting the bur or teeth, and the difference of resisting surfaces of metal against the back edge of the chisel, in consequence of its angle of cut, wedging it forward at the time of cutting the teeth; second, in the mode of constructing and operation of the chisel holder and stock, so as to cause the chisel, which is firmly held by a set-screw in the holder, to find its own adjustment upon the file blank at all times, under the stroke of the hammer, to make a uniform cut across the face of the blank; third, in the mode of construction and operation of the hammer, by means of cams, and regulator ratchet wheel, and spring on hammer axis, and detent pins, whereby the force of the hammer may be varied at pleasure to suit different kinds of work, without change of mechanical parts, and also to increase the force of the blow of the hammer as the file increases in width from the point toward the tang; fourth, in the mode of construction and operation of the feed motion, by means of an intermittent worm on the main driving shaft, operating a male and female screw or rack and pinion for elevating or operating a vertically inclined plane, whereby the bed is fed up under the chisel and upon which the file blank is held by clamping jaws, in combination with a hook tang holder during the operation of cutting. But to describe my invention more particularly, I will refer to the accompanying drawings forming a part of this specification, the same letters of reference wherever they occur referring to like parts.

Figure 1 is a right hand side elevation of the machine. Fig. 2 is a front end ditto. Fig. 3 is a left hand side ditto. Fig. 4 is a plan view of ditto. Figs. 5, 6, and 7 are de-

tached views of the upper and lower halves of the compound bed, and also of the table board, on which the compound bed is operated. Fig. 8 is a detached cut section of the chisel holder and stock. Fig. 9 is a detached view of the cam-ratchet wheel, spring and detent pins for controlling and operating the hammer. Fig. 10, representation of angle of cut of chisel, the red lines showing true cut of file tooth and black line what would be the cut if the file was held on a solid bed.

Letter A is the frame of the machine. Across the top of the frame and forming a part of it is a table board B, having a groove C, cut in its upper face. This groove traverses the length of the table in a slightly oblique direction from the front and right side of the machine to the back and left side of it. The object of this is to cause the lower half of the compound bed D, by means of a tongue  $a^2$  on its lower surface, to traverse the length of the feed table, in an oblique direction. On its upper face are two grooves  $b^2$ ,  $b^2$ , from the left to the right side obliquely across it, into which fit tongues  $c^2$ ,  $c^2$ , on the lower face of the upper half E of the compound bed. The object of this is to cause it to work up or forward by an independent motion of the positive feed against the edge of the chisel, in consequence of the percussion of the hammer upon the file blank F and the difference of resisting surfaces of the metal against the back edge of the chisel, in consequence of its angle of cut, wedging it forward at the time of cutting the teeth. This effect is illustrated in Fig. 10, in which the black outline shows the true cut and the red outline the acquired cut or upsetting of the bur or tooth, in consequence of the file blank and bed wedging forward at the time of the blow of the hammer, and as the chisel is held rigidly in the stock its point becomes a center of motion, while the upper part of it has a relative motion forward to the backward motion of the file blank, and thereby upsets the tooth to give the requisite angle to make a good file. As this result must be simultaneous with the blow of the hammer, like that of the peculiar motion of the hand holding the chisel under the action of the hammer, it will be obvious as to its importance.

In all machines heretofore used for cutting files, the effort to imitate the hand operation has been through the independent adjustable motion of the chisel by a swivel-like

motion. But the delicacy of touch of the hand operator with his knack of holding it firmly in the true center of percussion is not easily acquired by rigid and arbitrary metallic joints. My invention, therefore, aims to accomplish this result; but in contradistinction to all other experimenters in this branch of mechanics, I hold the chisel rigidly in the stock and employ the impinging force of the hammer upon the chisel, and the development of the metal under its point; at the time of cutting, to wedge or move the file blank and bed, upon which it is adjusted back, so as to cause the requisite upsetting of the tooth of the file uniformly and at all times alike—that is, as the impinging force of the hammer is upon the file blank, so will be the requisite amount of motion in the file blank and bed upon which it is secured, to upset the tooth at right angles, or nearly so, to the plane of the file.

It will be obvious that various modifications may be made in the bed upon which the file blank is to be cut, as suggested in my caveat filed as the basis of this application, so as to employ the percussion of the hammer and the wedging action of the point of the chisel to accomplish the same results I have described; and as I may desire to avail myself of such suggestions in building subsequent machines, I desire it to be understood that I do not disclaim my right to their use as a part of my invention.

Letter  $f^2$  is the tang holder, having a joint  $f^3$  in it and hooks  $g^2$  on its upper back edge, so as to hold the file blank down upon the bed. This tang holder fits into a mortise hole in the bed with just sufficient room to allow of its working up and down as the point of the file is depressed while under the action of the chisel.

Letter  $h^2$  is a lever jaw attached to the bed for holding against the side of the file blank while being cut.

Letter  $H$  is a vertical guide post at the back end of the frame  $A$ . In the guideway of this post works a triangular-shaped gate  $I$ , having on its longest side or hypotenuse a tongue  $i^2$ . This takes into a groove  $d^2$ , on the back end of the lower half of the bed  $D$ , so that as the gate is worked, by means of the female screw  $J$ , at the back edge of it (being forced into gear by a foot lever  $O$  at the side of the frame  $A$ ) with the vertical male screw  $K$ , rotated by means of a saw or ratchet wheel  $L$ , secured upon its upper end, and a worm  $M$  on the end of the main driving shaft  $N$ , the compound bed is fed up under the action of the chisel, as required, and drawn back again by the screw  $J$ , being thrown out of gear again by dropping the foot lever  $O$ .

Letters  $P$  are two pawls on the main driving shaft  $N$ . These pawls, as the shaft  $N$  rotates, operate a ratchet-wheel  $Q$ , running

loosely on the hammer shaft or axis  $R$ . At the side of the wheel  $Q$  is a stiffener spring  $S$ , having one end secured to the axis  $R$  and at its opposite side a detent pin  $s^2$ , which, by its adjustment, acts against a pin  $S^3$  in the axis  $R$  to hold the ratchet-wheel when it reacts; after the file has been cut, so as to preserve a uniformity of starting point in the force of the hammer in cutting the file, while the increasing force of the hammer is regulated by the pawls winding up the spiral spring on the ratchet-wheel one tooth at each succeeding blow of the hammer till the pawls come to the blanking plate  $S^4$  on the ratchet wheel, at which point the pawls cease to act, and the force of the blow of the hammer is kept at its maximum point till the file has been cut, when the pawls are thrown out of gear by an intercepting bar  $T$  and lever  $t^2$ , arranged at the side of the frame, holding the hammer shaft, passing in under them, and also of the toe  $t^3$  of the hammer  $t^4$ , so as to allow the main shaft  $N$  to continue its motion while the new file blank is being adjusted.

Letter  $V$ , in the chisel stock, secured on an axis  $v^2$ , arranged on a part of the frame of the machine. In the front end of it is a square mortise, into which is inserted a block  $V$ , having a slight vibratory motion, but no up and down motion. This block also has a round socket hole  $v^2$ , in its front end, in which fits the stem of the chisel holder  $W$ , with sufficient looseness to have a slight motion on its axis. These two parts are held in the stock  $V$ , by a pin  $v^3$ , passing vertically through their back ends. The object of this arrangement is to allow the chisel  $X$ , in the end of the holder  $W$ , to have a slight vibratory motion, as will as a rocking motion, to find its level on the face of the file blank, independent of any absolute motion in the chisel on its own axis, so that each blow of the hammer will be through the center of percussion to give the desired effect and action to the point of the chisel in upsetting the teeth of the file.

Letter  $y$  is a lever arranged on the hammer axis frame, operated by a cam  $z$ , on the main driving shaft, for the purpose of depressing the chisel just in advance of the blow of the hammer upon the blank, so that it may hold the blank down, and at the same time be at rest, when the hammer strikes the head of the chisel.

It will be perceived that this machine makes but one series of cuts, and may therefore be called a right-handed machine. To make the opposite transverse cuts, the machine will be made as a left-handed machine, requiring therefore two machines to complete the operation of cutting the file. This however is not absolutely necessary, but prefer it rather than make the one machine changeable to accomplish this

result, and besides as many machines will be used in cutting files, do not deem it any additional expense to have some made right handed and others made left handed for the purpose described.

Having now described my invention and its operation I will proceed to set forth what I claim and desire to secure by Letters Patent of the United States.

10 What I claim is—

1. The arrangement of a bed on which the file blank is cut, having a forward positive feed motion, and an independent forward motion against the edge of the chisel in consequence of the percussion of the hammer, and the difference of the resistance of the metal at the back edge of the chisel, wedging it forward at the time of cutting the teeth of the file to cause their upsetting substantially in principle of operation as hereinbefore described.

2. I also claim the combination and arrangement of the bed on which the file blank is cut operating in the manner substantially as set forth, with the triangular

feed gate, and side rails of the machine frame or substantially their equivalents for the purposes hereinbefore set forth.

3. I also claim the combination and arrangement of the ratchet wheel, spring and detent pins, or their equivalents, in combination with the pawls for operating the same for the purposes substantially as hereinbefore set forth.

4. I also claim the use of the compound self-adjusting chisel holder stock, in combination with the chisel whereby it is held rigidly in its place under the blow of the hammer in manner and for the purposes substantially as hereinbefore set forth.

5. I also claim the use of the triangular gate, as a feed motion to my compound bed, in combination with the apparatus for operating the same substantially as hereinbefore set forth.

WM. VAN ANDEN.

Witnesses:

CHARLES L. BARRITT,  
C. KESSLER SMITH.