

A. WEED.
File-Cutting Machine.

No. 209,531.

Patented Oct. 29, 1878.

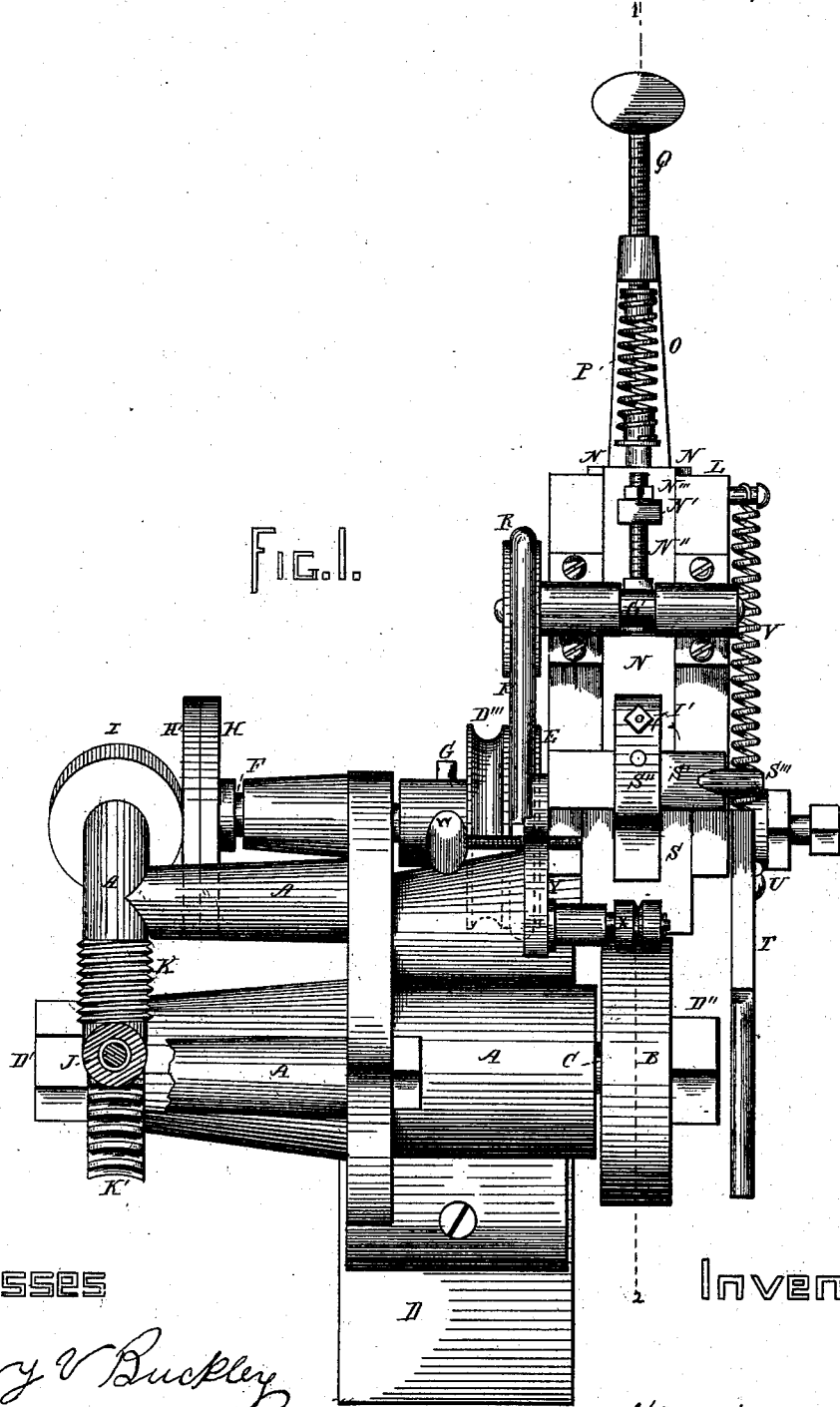


FIG. 1.

Witnesses

Henry V Buckley
Albert C Gachale

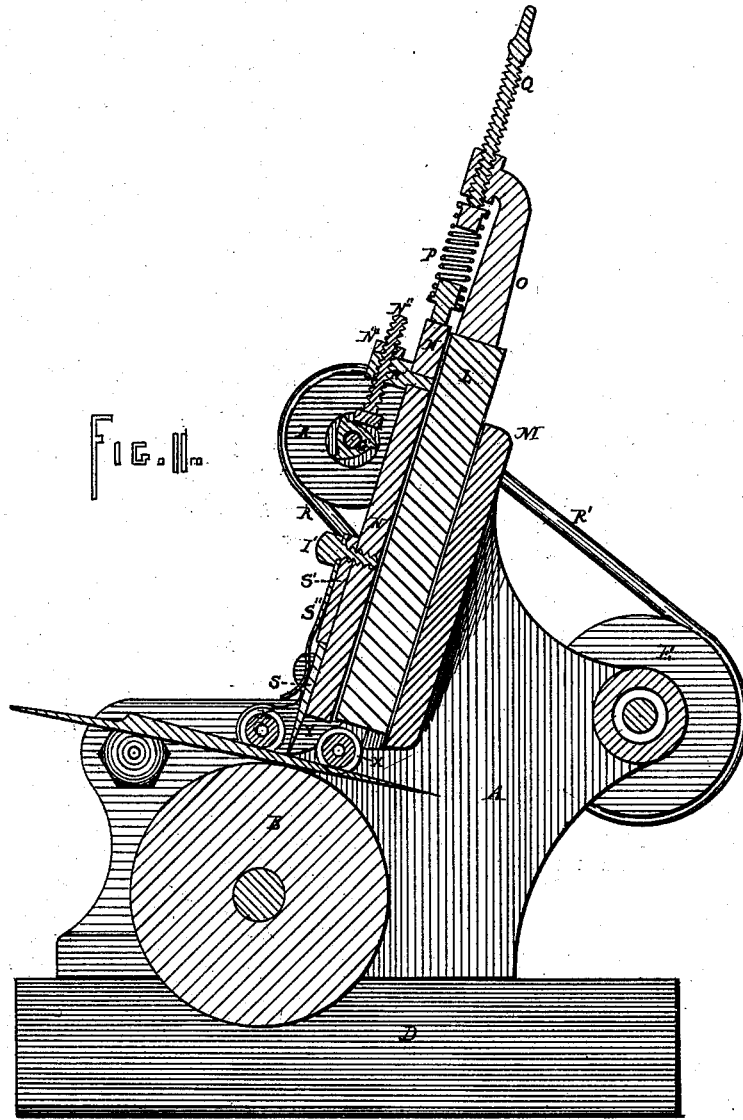
Inventor

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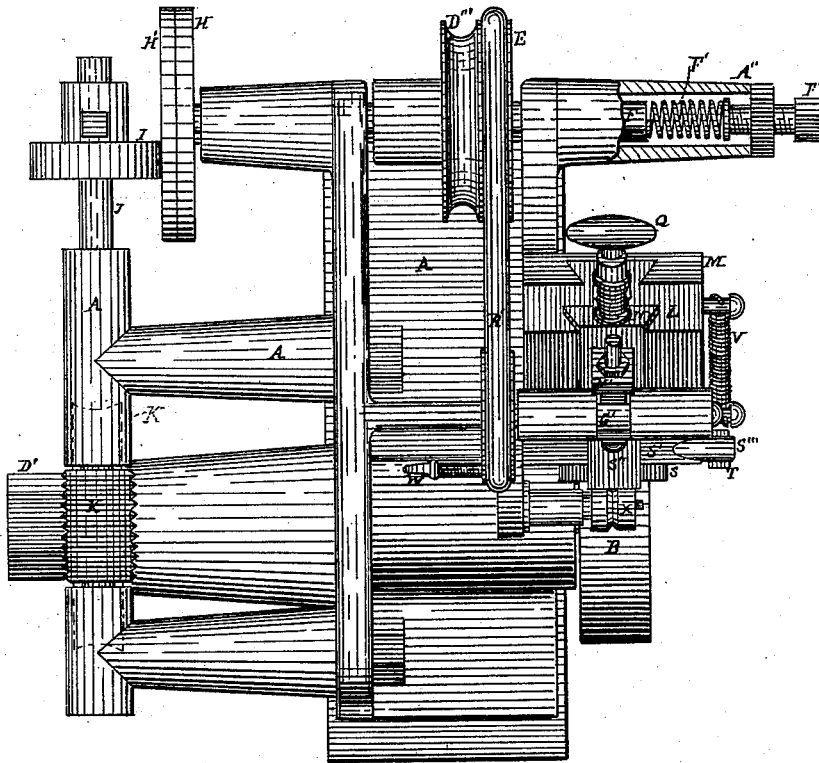
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FIG. III.



Witnesses

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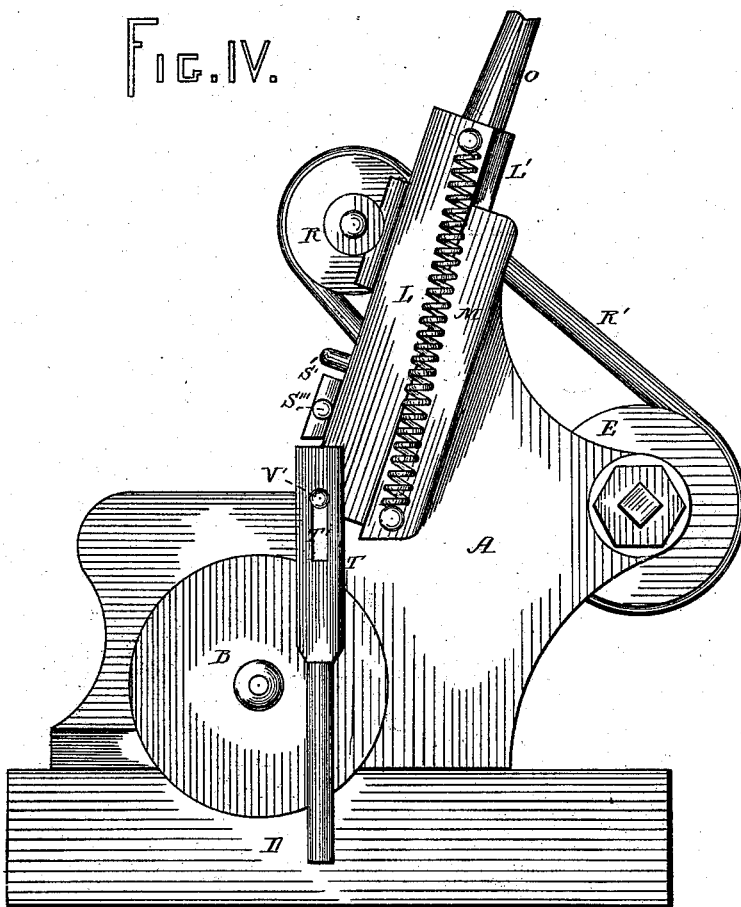
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FIG. IV.



Witnesses:

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UNITED STATES PATENT OFFICE.

ALFRED WEED, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO HIMSELF
GEORGE BARNETT, AND HENRY BARNETT, OF SAME PLACE.

IMPROVEMENT IN FILE-CUTTING MACHINES.

Specification forming part of Letters Patent No. **209,531**, dated October 29, 1878; application filed
January 19, 1878.

To all whom it may concern:

Be it known that I, ALFRED WEED, of the city of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in File-Cutting Machines; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the annexed drawings, making part hereof.

My invention relates most particularly to that class of file-cutting machines used to cut the edges of files. Heretofore a flat movable bed-plate has been used, and the file to be cut was laid thereon, and as the bed-plate moved forward the knife descended and cut the nicks. The objection to this was, that each bed-plate had to be specially adapted to receive the particular form or size of file to be cut, and the machines thus required frequent changes of bed-plates to be made.

In my machine, in addition to other improvements, I employ a revolving drum for a bed-plate, and the cutting-head is movable vertically, so that it is raised to receive, and then is set down upon, the file to be cut, and it will thus, without any adjustment, receive and hold a file of any size. The machine shown is adapted to cut three-sided files of any size.

The nature of my invention will be fully set forth in the following specification and claims.

To enable others skilled in the art to make and use my invention, I will describe its construction and mode of operation.

In the drawings, Figure 1 is a perspective view of my invention, looking at the machine from the feeding end; Fig. 2, a vertical cross-section of the same on the line 1 2 of Fig. 1; Fig. 3, a plan view; Fig. 4, a side view, showing simply a design and location of the treadle-bar upon the side of the machine.

A A A is the frame of the machine, made of cast-iron; D', the base; B, a drum to serve as a bed for holding the file to be cut, located upon a shaft, C, which passes through part of the frame, as shown, and secured in place by nuts D' D''. D''' and E are pulleys located upon shaft F, which passes through part of frame A, as shown.

G is a set-screw to hold pulleys D''' and E

in place upon the shaft. H is a friction-wheel, also located upon shaft F, and having its face armed with leather or other frictional surface; I, a milled wheel located upon shaft J, which passes through part of the frame. The gears in this wheel I are small, being only deep enough to insure its turning when in contact with the face H' of wheel H.

The end of shaft F opposite to the end upon which wheel H is located is not carried to the outer extremity of the arm A'' of the frame A, but terminates before it reaches that point. Through the end A'' of the frame a set-screw, F'', is passed, working in a thread in said end of frame A'', and between this end of shaft F and the end of set-screw F'' a compressed spiral spring, F', is situated, which acts as a cushion to force the wheel H against the wheel I with a pressure depending for its degree upon the driving in or out of set-screw F''.

When the spring F' is tightened down upon the end of shaft F the shaft is forced back, and keeps the wheels H and I in close and continuous contact. All the shafts C, F, and J are surrounded by parts of frame A as by sleeves for bearings.

K is a worm located upon shaft J and gearing into cog-wheel K', which is located upon the same shaft, C, as drum B. L is a slide, which, by its dovetail attachment L', slides in a groove in the back or support M, which is a part of frame A.

N is a dovetail bar sliding in a correspondingly-shaped groove in the slide L. O is a standard located upon the top of the slide L. This standard O is bent over at its upper extremity, and a set-screw, Q, passes down through it above, terminating below in a head, around which the end of a compressed spiral spring, P, is secured. This spiral spring is secured at its lower end to a lug upon the upper end of the dovetailed slide N, and tends to force this piece N down. N' is a lug rigidly attached to the front surface of slide N, and it has a female thread, through which is passed a screw, N'', which terminates in a head below. N''' is a lock-nut upon this screw N'', to set the screw at any desired elevation. G' is a cam in the form of a ratchet-wheel in cross-section, situated upon and turning with the shaft of

pulley R. R' is a belt of rubber passing over pulleys R and E. S'' is an adjustable spring-plate for holding the cutter or chisel S in place against the plane face of slide N, and up against the upwardly-inwardly beveled edge of plate S'. The spring S'' has holes in it to adjust it at various heights, and it is secured rigidly at any desired height by the screw I', which passes through it and the upper part of plate S' into slide N, to which it rigidly secures both plate S' and spring S''. The lower end of this spring impinges against the outer face of chisel S. S''' is a part of plate S', in the form of an outwardly-projecting lug immediately over the top of treadle-bar T. T' is a slot in treadle-bar T, through which projects a pin, V', rigidly secured upon slide L. V is a spiral spring, attached under tension at its upper end to a pin on the upper part of slide L, and at its lower to a pin on the stationary part M of frame A. W is a set-screw set in a thread upon a flap or ear which projects from slide L. This set-screw impinges against the side of the broad chisel S, to move the chisel along at intervals, whereby the wear is evenly distributed over the edge of the chisel. This chisel is only held in place by the spring, and is backed in its stroke by the plate S'. X X are grooved rollers to guide the file being cut as it is moved forward by the motion of the drum B.

Power is applied to my machine by a belt upon pulley D'''. Motion is thus communicated to shaft F, wheel H, thence to wheel I, shaft J, worm K, wheel K', and thence through shaft C to the drum B, which feeds the file to the chisel S. The pulley E, being a companion to pulley D''' and upon the same shaft, turns with it, and communicates motion by belt R' to pulley R to the three-throw cam G'. This cam raises the head of screw N'' by its incline, and drops said head over the edge of its teeth three times in one revolution. The cam raises this screw, which is rigidly secured to the slide N, thus raising this slide, and the spring P forces this slide down again after such raising with great force. Now, the chisel S being secured against the lower part of the face of slide N and projecting below, it is thus raised and lowered with great force. The degree with which spring P is compressed by the set-screw Q regulates the force of this downward stroke.

In order to cut a file, the treadle-bar T is first raised by a treadle beneath until its end strikes the lug or projection S'''. This treadle-bar then, by this lug, raises the slide N, and the chisel S is thus raised away from contiguity to the bed-drum B. The upward pressure of the bar being continued, the lower end of the slot T strikes the pin V, and thus raises the whole slide L, and removes the rollers X X away from the face of drum B. The file the edges of which it is desired to cut—say a taper saw-file—is placed with one of its flat sides upon the drum B, and the upward pressure of bar T is then slowly relaxed, thus bringing

the rollers X X down first; and, lastly, the chisel S rests against the single upper edge of the file. Thus the file sustains the whole weight of the cutting-head N L of the machine. The upper edge of the file fits in the grooves of rollers X X, the chisel S resting between these rollers upon the file. The point at which the file touches the drum B is directly beneath the point at which the chisel touches the file, the drum B thus forming a backing to assist the file to bear the stroke of the chisel. The chisel then receives its rapid upward-and-downward motion, and commences cutting the teeth in the edge of the file, and the drum B, by its motion, carries the file forward under the roller X X at a speed regulated to move it slightly forward, so as to take the successive strokes of the chisel at the proper distance apart—to wit, the distance at which it is desired to have the teeth apart.

To make the teeth of the file deeper, it is only necessary to tighten down the set-screw Q to make spring P bear more forcibly upon slide N during the downward stroke of this slide and its chisel S. To make the teeth shallower, the spring P is relieved to the desired degree by raising set-screw Q, which thus lightens the force of the stroke of chisel S. It is noticeable that the shaft J, Fig. 3, extends beyond wheel I, and that this wheel is secured thereto by a sleeve and set-screw.

Now, in order to have the drum B travel more rapidly, so as to carry the file faster under chisel S, and thus to cut the teeth of the file farther apart, it is only necessary to move wheel I along shaft J so that its periphery touches wheel H nearer the perimeter of the latter. This, as the wheel H travels at an even speed, will turn wheel I faster, for it now has to traverse a larger circle or surface, H', in the same time as it formerly traversed the smaller circle. If it is desired to cut the teeth closer together, of course the drum B is slowed by reversing the operation last described.

A weight may be substituted for spring V, by hanging said weight from the upper pin upon the slide L, to which the upper end of spring V is now shown to be secured. Each of the grooves in the rollers X X is cut so deep, having a channel at its bottom, that the edge of the file does not touch the bottom of the groove. Thus the second roller—the one behind the chisel—is prevented from jamming the teeth of the file as it comes to it from the chisel.

Any shaped file can be cut upon my machine by simply adapting the shape of the grooves in the rollers to hold them. These rollers can be taken off and supplanted by others without difficulty, as they are simply held by pins. Gum can be substituted for the spiral spring F'.

The rollers X X relieve the friction which would otherwise be occasioned by the weight of the cutting-head resting upon the files, and the round form of drum or feed-bed B enables the file to be handled close in to the point at which it is cut.

If it is desired to stop the cutting-chisel while the machine is running, to change the blank or for any other purpose, it is only necessary to raise the head of the screw N', which rests against the three-throw cam G', by elevating treadle-bar T until it pushes up the projection S''' sufficiently for that purpose.

The fact of the chisel itself being capable of lateral adjustment in its carrier or holder insures its easy movement to and fro, so that no single point of its edge has to bear continuous wear, and is more convenient than moving the whole cutter-head.

It is very important to raise the chisel and its carrier the moment the last burr is cut upon the file, for the strokes of the chisel are so extremely rapid that two or three false strokes would be given by it before the cutter-head could be raised far enough away to carry the chisel out of reach, and yet it is equally important that the file should be held firmly until that last stroke is delivered, to insure true cutting, and yet remove the liability of the chisel to destroy what it has already done. I therefore first remove the chisel by a quick movement of the treadle, and subsequently release the file.

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

1. In a file-cutting machine provided with a suitable bed-plate, the cutting-head adapted to be raised up and then rested down upon the file to be cut, whereby the latter is held in place upon the bed-plate, and the chisel is given the same stroke or traverse irrespective of the size or thickness of the file to be cut, in combination with a cam to lift the chisel situated

upon the movable cutter-head, substantially as described.

2. In a file-cutting machine, the combination of a cutting-head movable upward and downward, so as to rest its weight upon the file to be cut, and the grooved rollers X, to guide the file and permit it to pass freely under the weight of the cutting-head, substantially as described.

3. In a file-cutting machine, the combination of a chisel, S, a revolving feeding bed, drum, or wheel, B, worm K, and worm-wheel K', and grooved rollers X X, the said chisel being adapted to strike the file to be cut at a point directly above the point of contact of the file with the curved surface of said feeding drum or wheel, substantially as described.

4. In a file-cutting machine, the combination, with the feeding-bed, of two friction-wheels, H and I, worm K, and worm-wheel K', the two former being so arranged that the tread of one wheel traverses in a circle the flat face of the other, the former being adapted to be shifted toward or from the center of the face of the later, whereby its speed and the speed of the feeding-bed can be increased or diminished, substantially as and for the purpose described.

5. In a file-cutting machine, the combination, with the chisel-carrier and the cutting-head, of a slotted treadle-bar, so arranged that the chisel and its carrier can be raised first, and the whole cutting-head immediately afterward, by one upward movement of the treadle-bar, substantially as described.

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Witnesses:

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