A. WEED.

File Cutting Machine.

No. 46,865. Patented March 14, 1865.

Fig: 2.

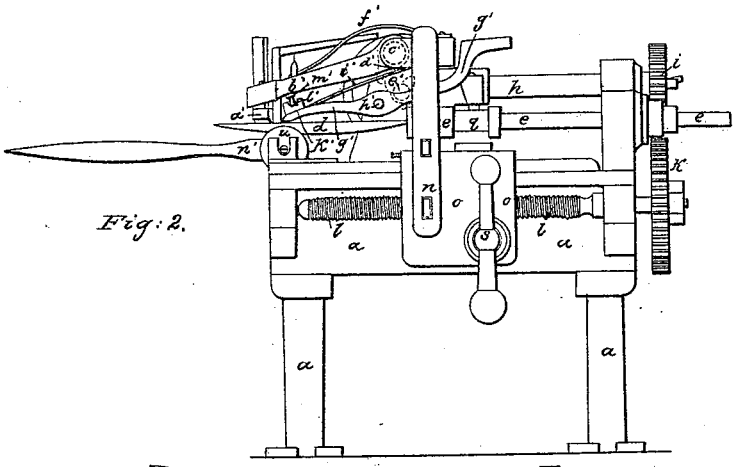


Fig: 7.

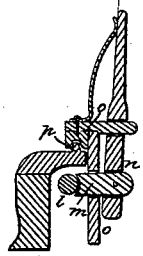


Fig: 6.

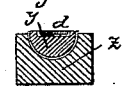


Fig: 3.

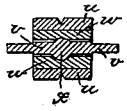


Fig: 5.

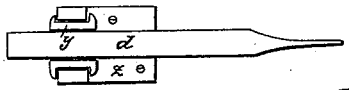
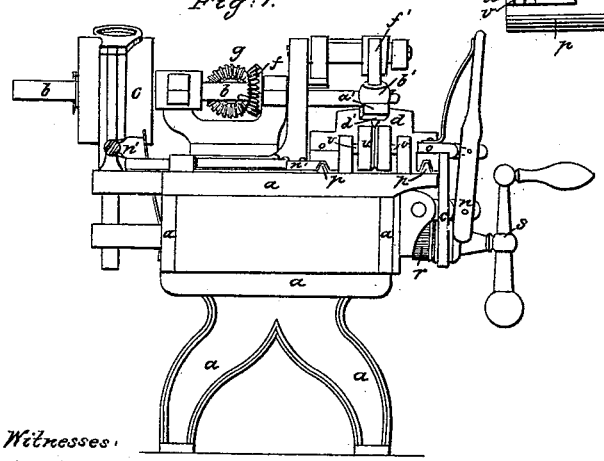


Fig: 4.

Fig: 1.



Witnesses:
Edw. Barton.
Wmann.

Inventor:
A. Weed.
by his atty
Joseph Gavett.

UNITED STATES PATENT OFFICE.

ALFRED WEED, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO HIMSELF AND LEWIS J. BIRD, OF SAME PLACE.

MACHINE FOR CUTTING FILES.

Specification forming part of Letters Patent No. **46,865**, dated March 14, 1865.

To all whom it may concern:

Be it known that I, ALFRED WEED, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in File-Cutting Machinery; and I do hereby declare that the following description, taken in connection with the accompanying plate of drawings, hereinafter referred to, forms a full and exact specification of the same, wherein I have set forth the nature and prin ciples of my said improvements, whereby my invention may be distinguished from all others of a similar class, together with such parts as I claim and desire to have secured to me by Letters Patent.

The figures of the accompanying plate of drawings represent my improvements. Figure 1 is an elevation of my new machine. Fig. 2 is a side elevation of the same. Fig. 4 is a top view. Figs. 3, 5, 6, and 7 are detail views, to be hereinafter referred to.

Previous to explaining the peculiar features of my invention it may be well to point out some of the greatest difficulties heretofore experienced in producing files by machinery equal to those cut by hand. One of the obstacles to be overcome has arisen from the necessity of keeping the top surface of the blank always horizontal, which has not, previous to my improvements, been accomplished in machines for cutting files. If the top surface of the blank is not kept perfectly true and level, it will be evident that one edge alone might, at some portions of the operations, be cut, owing to the inclination or "tipping" of the blank. Exact uniformity in the depth of the teeth has also been almost impossible to obtain in file-cutting machines, especially where "taper" files are to be made. For instance, the wider parts of the blank require more force of blow to be indented to the proper depth than the narrower ends, because, in the first case, the cutting-tool has to operate on a greater surface. Lastly, in cutting files by machinery it has been customary to place the blank upon a bed, and then feed both blank and bed together to the cutting-chisel, which arrangement, owing to the difficulty of keeping the blank at all times upon a firm and solid bearing, has allowed the file to spring and warp under the blow, thereby producing, of course, imperfect cuts.

The most essential features of my improvements consist, first, in so supporting the blank while it is being fed through the machine and receiving the blows of the chisel as to always keep its top surface horizontal, so that the cut shall be of a uniform depth across it; second, in an arrangement of devices which form the teeth of the same depth throughout the whole length of the blank, while at the same time the force of the blow of the chisel does not vary; third, in feeding the blank independently of its bed-piece and in such a manner that it always has a firm bearing immediately under where the blow is struck, so that the file cannot possibly spring or warp, thus insuring uniformity of cut.

a a a a in the drawings represent the supporting frame-work of my new machine. *b b* is the driving-shaft, actuated by a belt on the drum *c*. The blank *d*, Fig. 2, is inserted in the end of a shaft, *e e*, which has a forward-and-back motion imparted to it as follows: On the driving-shaft *b b* is a bevel gear, *f*, engaging with a similar gear, *g*, on the one end of a cross-shaft, *h*, on the other end of which is a gear, *i*, that through a series of toothed wheels, *k k*, &c., Figs. 2 and 4, rotates a screw-shaft, *l l*. The screw-shaft *l l*, by means of a half-nut, *m*, attached to a lever, *n*, Fig. 7, fastened to a traveling carriage, *o o*, gives a forward movement to the latter. The carriage *o o* moves upon suitable ways, *p p*, and carries with it a cross-piece, *q*, which forms the bearing of the shaft *e e* in which the blank is held, the shaft *e e* being free to revolve in the cross-piece *q*, if desired, but also secured therein, so as to move with the traveling carriage *o o*. The carriage *o o*, and consequently the blank, after having been fed forward the required distance, can be drawn backward to its starting-point by disengaging the half-nut *m* from the screw-shaft *l l* by means of the lever *n*, Fig. 7, and then rotating the toothed wheel *r*, that engages with the threads of the screw-shaft *l l*, by means of a winch, *s*. It will be evident that the speed with which the blank is fed through the machine, and consequently the distance between the teeth, can be varied by adding to or taking from the gears between the cross-shaft *h* and the screw-shaft *l l*. The bed-piece or bearing which sustains the blank under the point where it is struck by the

chisel consists, for round or triangular files, of a roller, *u*, Figs. 2 and 3, turning upon a shaft or axle, *v v*, in the direction in which the blank is moving. The roller *u* has inserted in it a hollow shell, *w w*, made in halves, so as to allow it to receive a ball or bulb, *x*, formed in the shaft *v v*, the whole arrangement allowing the roller *u* both to rotate on the shaft *v v* and to receive a rocking motion or play thereon in the direction of the transverse section of the file, as will be understood by inspection of Fig. 3. The bed-piece for flat files is represented in Figs. 5 and 6, and consists of a semicircular bearing, *y*, properly slotted for the reception of the blank, and resting in a grooved block, *z*, by which arrangement the bearing *y* can also play laterally in its journal *z*. By arranging the bearings to the blank, as above described, so that while serving as a firm bed-piece thereto they are free to play laterally, it will be seen that whatever may be the unevenness of the blank its top surface must necessarily always be kept in a perfectly horizontal position, so as to present its whole width to the chisel, the importance of which has been hereinbefore explained.

a' is the cutting-chisel, set in an arm, *b'*, turning upon a bearing at *c'*, and lifted by a cam, *d'*, upon the main driving-shaft, acting upon a cam, *e'*, on the shaft of the arm *b'*. The blow is given by means of a bent spring, *f'*. The blank is held firmly upon its bed-piece by means of a lever, *g' g'*, turning upon a pivot at *h'*, and held down by a spring, *i'*. The end of the lever *g' g'* bears upon the blank immediately back of the cutting-chisel, and has upon it a projection, *k'*, in which is a wedge, *l'*. Upon the wedge *l'* strikes an elastic bunter, *m'*, attached to the under side of the arm *b'*. The depth to which the chisel will cut may be regulated by sliding the wedge *l'* in or out in its bearing *k'*, thereby varying the extent of stroke of the hammer arm. Thus in cutting a taper file, for instance, the chisel strikes the narrow portions thereof with the same force as the wider parts, so that the depth of cut throughout the whole length of the file will be the same, because by the above-described arrangement, although the blow is just as heavy on the narrow ends, the cutter cannot penetrate any deeper than on the widest part of the blank.

n' n' is an arrangement of lever-arms for throwing off the driving-belt of the machine when the file is finished, by the forward movement of the traveling carriage *o o*, which need not be herein more particularly explained.

By feeding the file, as hereinabove described, independently of its supporting bed-piece I am enabled to arrange the latter so that it forms a solid bearing at all times immediately under the point of impact of the chisel, whereas if the blank had a continuous bearing along its whole length, as has heretofore been the case, the blank (if at all uneven in its shape, so as not to touch every part of its bearing, or if any portion of the bearing itself is not true) would spring under the blow and cause an imperfect cut.

It will be obvious that the shaft in which the blank is set may have any desired rotatory movement imparted to it by means of proper gearing applied to it.

Having thus described my improvements, what I claim as my invention, and desire to have secured to me by Letters Patent, is—

1. Supporting the blank by a roller so constructed and arranged as to be susceptible of a lateral movement or play, and so as to keep the top surface of the blank always horizontal and present its whole width to the chisel, as set forth.

2. The combination of an elastic pad or bunter attached to the cutter-arm with an adjustable stop, so operating together that while preventing variation in the force of the blow, as the file is being fed along, the depth of the cut may be regulated at pleasure, substantially as described.

3. The method herein described of holding and feeding the file-blank by means of a feed mandrel or shaft carrying the one end of the blank in a central socket, and a bed or the equivalent thereof for the support of the other end, or of any part thereof intermediate between the two ends, in combination with a spring-pressure pad or lever for holding the blank on the support, substantially as set forth.

4. In combination with a feed mandrel or shaft holding one end of the file-blank, a roller-bed and a pressure-pad for supporting and holding the other end, or any part thereof intermediate between the two ends.

5. The construction and arrangement of the roller *u*, shell *w*, and ball-shaft *v*, as described.

ALFRED WEED.

Witnesses:

SAMUEL M. BARTON,

GEO. W. MANN.