

F. H. BROWN.
FILE-CUTTING MACHINE.

No. 174,060.

Patented Feb. 29, 1876.

Fig. 1

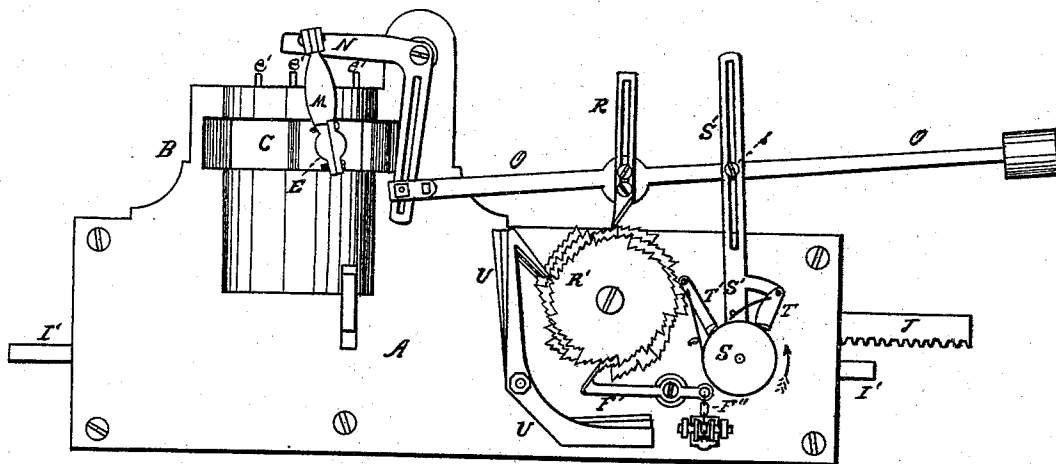
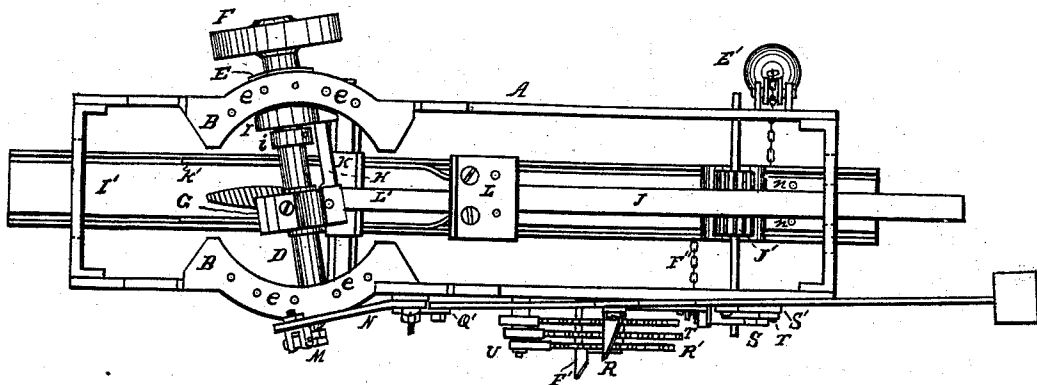


Fig. 2



WITNESSES.

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Fig. 3.

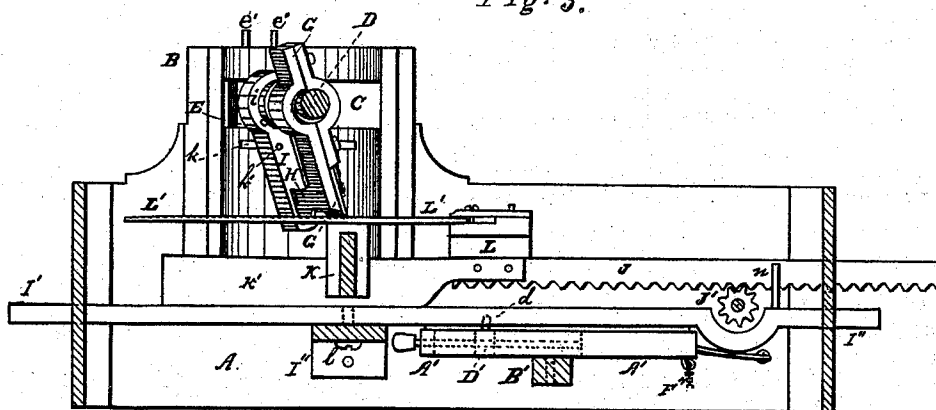
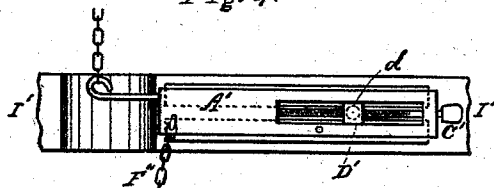


Fig. 4.



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FRANKLIN H. BROWN, OF INDIANAPOLIS, INDIANA.

IMPROVEMENT IN FILE-CUTTING MACHINES.

Specification forming part of Letters Patent No. **174,060**, dated February 29, 1876; application filed October 17, 1874.

To all whom it may concern:

Be it known that I, FRANKLIN H. BROWN, of Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in File-Machines, of which improvements the following is a full, clear, and exact description, which will enable others skilled in the art to which my invention appertains to make and use the said improvements, reference being had to the accompanying drawing forming a part hereof, and in which—

Figure 1, Sheet 1, is a side elevation of a file-machine embodying my invention; Fig. 2, Sheet 1, a top or plan view of the same; Fig. 3, Sheet 2, a vertical longitudinal section thereof; Fig. 4, Sheet 2, a bottom view of the carrier-shifter.

Like letters of reference indicate like parts.

The grooves and burrs or serrations in hand-made files are unavoidably cut with some degree of irregularity, although regularity in this respect is usually aimed at. The operation of making files by hand is therefore tedious and expensive.

I am aware that much of this labor and expense has been avoided by cutting the serrations by means of machines, but the files thus made are cut with mechanical accuracy. Experience in the use of files of both of these classes has demonstrated that the irregularity with which the serrations in hand-made files are cut renders the latter superior to those cut by machinery. When the serrations are regular the workman, by moving the file in a line parallel to those in which the serrations lie, is liable to leave ridges on the surface upon his work; but if the serrations do not lie in parallel lines this result cannot happen.

My object is to make a file-machine whereby files may be made possessing this advantage of hand-made files, and to improve the construction and operation of the machines in other respects. To this end, my invention consists of the means, substantially as hereinafter set forth, employed to produce grooves, burrs, or serrations at irregularly-varying distances apart, and not lying in parallel lines. It also consists in certain other novel features relating to the construction of the machine, substantially as hereinafter specified.

In the drawing, A represents the frame of the machine. B B are vertical extensions of the frame. These extensions lie in opposite arcs of the same circle, as shown in Fig. 2, and are slotted, as shown at C C. D is a shaft, and E E are sliding blocks in which it has bearings, the blocks being arranged in the slots C C. *ee* are perforations passing vertically through the upper part of the extensions B B. The blocks E E have small sockets in them, arranged to correspond to one or more of the perforations *ee*, and *e' e'* are removable pins passing through the perforations *ee* and entering the sockets in the blocks E E. By this means the shaft may be adjusted to lie across the frame in a line at a greater or less angle thereto. F is the driving-wheel. G is the cutter. The cutter is mounted on an eccentric on the shaft D. The cutter-blade is preferably vertically adjustable on its stock. H is an arm extending laterally from the stock of the cutter. I is a pendent piece loosely mounted on the shaft D, and is held in its place thereon by means of the collar *i*. That face of the piece I which is adjacent to the frame is rounded to correspond to the form of the frame at that point. The piece I is also vertically slotted to receive the arm H, the slot being long enough to allow the arm to play therein. *k* is a slot in the frame A, and *k'* is a pin resting in the said slot and entering the arm H. A nut is run upon the outer end of the pin *k'*, to hold the arm H firmly in its place.

The lower end of the piece I is held forward of its upper end by means of the pin *k'*, and the cutter is thus inclined and held in about the same position it occupies during the operation of cutting the files by hand. The point at which the arm H, or a pivotal projection therefrom, enters the slot in the piece I is in, or nearly in, a line coinciding with the cutting-edge of the cutter. The rotation of the eccentric on which the cutter is mounted gives the latter its stroke, and tilts it forward slightly about the time its downward movement ceases. The lower end or edge of the cutter is only slightly tilted, if at all, for the reason that the arm H enters the slot *k* at a point in, or nearly in, a line with the said edge. This edge, therefore, is not subjected to such

a strain as will be likely to injure it during the tilting movement of the cutter, the strain falling upon the arm H. The part just above the cutting-edge, however, tilts sufficiently to raise a burr on the ridges cut.

I' is a grooved way, pivoted to the cross-piece I'' at the point l, and passing through slots in the ends of the frame A, said slots being considerably longer than the said way is broad, so that the latter may swing horizontally on its pivot. J is a rack, driven by the pinion J'. K is a vertically-adjustable anvil, having lateral wings playing in vertical slots in the frame A. K' K' are anvil-supports, attached to the rack J, and riding in grooves in the way I'. The upper edges of these supports correspond in form to the faces of the file-blank—if the latter are thickest at their centers the supports should be correspondingly shallow. The anvil-supports may be removable. L is a clamp, carried by the rack J, and L' is a file-blank, held by the clamp and resting freely on the anvil, or on a cushion thereon. *nn* are pins, projecting from the way I'. The rack J and the parts carried by it follow the movement of the way I' when the latter is turned on its pivot. M is a pitman, driven by a crank-arm projecting from the end of the shaft D. This arm terminates in a ball, which is inclosed in a socket in the lower end of the pitman. The upper end of the pitman is connected to a bell crank, N, by means of a universal joint. The vertical arm of the bell-crank is slotted, as shown. O is a connecting-arm, jointed to a sliding block adjustable on the slotted arm of the bell-crank. R is a vertically-adjustable pawl or dog. R' R' are loosely-mounted and irregularly-serrated wheels, on which the pawl R rests. S is a friction-wheel, rigidly mounted on the shaft of the pinion J'. S' is a lever, through which the shaft last named passes freely. The upper part of this lever is slotted, as shown; and *s* is a pin, passing through this slot into the arm O. T is a friction-pawl, pivoted to a lateral arm projecting from the lever S', as shown. This pawl rests on the wheel S. T' is a stop-pawl or dog, preventing the rotation of the wheel S, except in one direction; and U U are hooks, performing the same function in connection with the wheels R' R'.

When the shaft D is rotated, the pitman M communicates its motion to the bell-crank, and the latter draws the arm O back and forth. The movement of the arm O tilts the lever S' back and forth, and this movement results in carrying forward the rack J and the file-blank step by step toward the cutter; consequently a new groove, serration, or burr is cut in the blank by each downward stroke of the cutter. The dog or pawl R, by resting on the wheels R' R', carries one or more of these wheels forward one notch each time a cut is made in the blank, and then rests on a succeeding notch, the latter being either slightly higher or lower than the preceding notch.

By this means the pin *s* is shifted to a higher

or lower position in the lever S', and the stroke of the latter is thus varied, and this variation results in making unequal spaces between the cuts made in the blank. Without the employment of other mechanism, however, the cuts would be parallel to each other.

A' is a block pivoted to the cross-bar B'. C' is a pin turning freely in the block A'. This pin is so shouldered as to be prevented from being moved longitudinally in its bearings, and its central part is screw-threaded, as shown in Fig. 4. D' is a nut or block on the threaded part of the pin C'. The block D' moves in a slot in the block A' when the pin C' is turned. A pin, *d*, projects from the block D' into a groove in the way I'. The slot in which the block D' moves, and the groove into which the pin *d* projects, extend the long way of the parts into which the said slot and groove are cut. E' is a weight connected to an arm on one end of the block A' by means of a chain passing over an anti-friction-roller, as shown in Fig. 2. F' is a lever pivoted to the frame A. One end of this lever is bent and beveled to ride in the notches of the wheels R' R', and the other is connected to the block A' by means of the chain F'' also passing over a friction-roller. When the wheels R' R' are rotated, the lever F' is set in motion, and this motion is communicated to the block A', to the way I', and to the rack J and its attachments, thus moving the file-blank in such a manner that all of its serrations will not lie in lines parallel to each other. The degree with which these serrations vary from parallel lines may be controlled by setting the pin *d* a greater or less distance from the point l. The irregularity of the movement of the way I' upon its pivot is caused by reason of the irregularity of the notches in the wheels R' R', in which notches one end of the lever F' rests, being held therein by the weight E'.

The stroke of the lever S' may be controlled either by adjusting the inner end of the said lever at a greater or less height in the slotted arm of the bell-crank N, or by setting it at a greater or less height in the pawl or dog R.

It will now be perceived, from the foregoing description, that the movement of all the parts is derived from the rotation of the shaft D; that the said shaft is adjustable for the purpose of so setting the cutter that it will strike the blank at any desired angle; that the movement of the cutter is such that it not only enters the blank, but turns a burr on the upper edge of each ridge it makes therein; that the serrations in the blank will not only vary from each other irregularly with reference to the spaces between them, but that they will not all lie in parallel lines; and that not only the spaces between the serrations, but the degree in which they vary from parallel lines, may be controlled.

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

1. The combination of the curved, perforated, and slotted extensions B B, cutter-shaft D, sliding block E E, and pins *e' e'*, substantially as and for the purposes specified.

2. The combination of the eccentric shaft D, cutter G, arm H, vertically-slotted pendant I, and extensions B B, having therein the horizontal slot *k* to receive a pin projecting from the said pendant.

3. The combination of the vertically-sliding anvil, the longitudinally-sliding and laterally-rocking anvil-supports, having their supporting edges formed to correspond to the swell of the blanks, the cutter, and the blank-clamp or carrier, substantially as and for the purposes specified.

4. The combination of one or more ragged or irregularly-serrated wheels R' R' with the

feeding mechanism, for the purpose of thereby rendering irregular the serrations cut into the blank.

5. The combination of the pitman M, bell-crank N, adjustable arm O, and feed-lever S', substantially as described, for the purpose of thereby controlling the stroke of the latter.

6. The combination of one or more wheels R' R', the lever F', the pivoted block A' connected to the said lever and provided with the adjustable pin *d*, the pivoted way I' entered by the said pin, and the weight E', substantially as and for the purposes set forth.

FRANKLIN H. BROWN.

Witnesses:

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N. C. GRIDLEY.