W. T. Nicholson,

Forging File-Blanks,

No. 45,850, Patented Jan. 10, 1865.

Fig. 1.

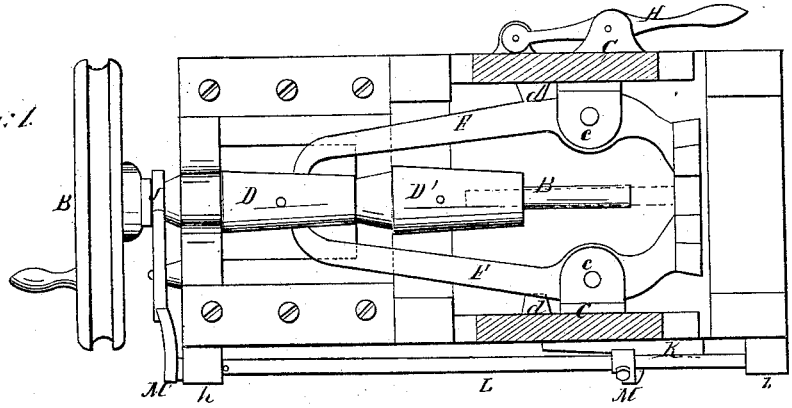


Fig. 3.

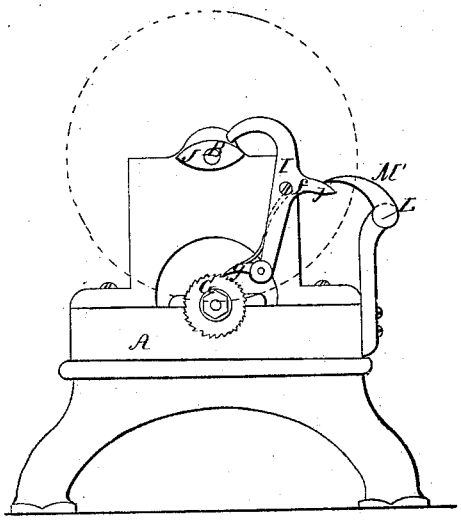
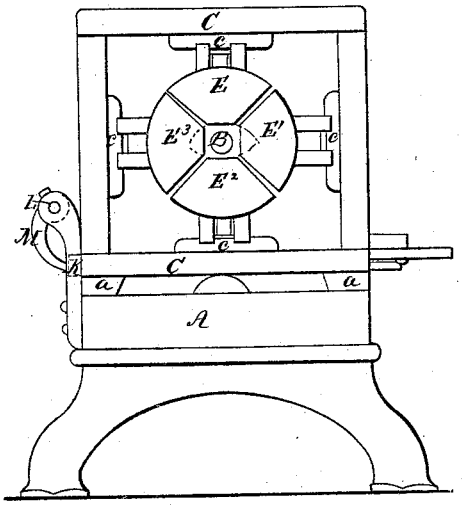


Fig. 2.



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UNITED STATES PATENT OFFICE.

WM. T. NICHOLSON, OF PROVIDENCE, RHODE ISLAND.

IMPROVED MACHINE FOR FORGING FILE-BLANKS.

Specification forming part of Letters Patent No. **45,850**, dated January 10, 1865.

To all whom it may concern:

Be it known that I, WILLIAM P. NICHOLSON, of the city and county of Providence, in the State of Rhode Island, have invented a new and useful Improvement in Machines for Forging File-Blanks; 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.

Figure 1 is a longitudinal section. Fig. 2 is an end view. Fig. 3 shows the arrangement for operating the feed-motion.

It is highly desirable that the several sizes of blanks which are intended to be used for files, whose teeth are to be cut by machinery, should be as nearly as possible, uniform in shape.

In hand-cut files slight differences in the shape of the blanks are of comparatively little importance, but as in a machine for cutting files it is necessary to secure the blank in a soft metal bed, which ought to be the exact counterpart of the blank in shape, any want of correspondence to a perfect pattern is attended with inconvenience.

The first part of my invention relates to a means for giving a form to the blank, which shall be controlled by the form and shape of the pattern which may be selected; and it consists in the use of such pattern to perform the ufnction of actuating movable swages which work upon the metal, and in combination with the progressive movement of the blank at the same time to give to it the proper shape.

In the accompanying drawings, A represents the bed or table of the machine, upon which the parts are mounted.

B is the main shaft to which power is communicated, and C is a carriage to which the swages are attached, and which is capable of sliding upon a railway-track, *a a*, upon the top of the table A. Upon the main shaft, which works in the boxes *b b*, are placed the pattern-cams D D′, which are each of a length equal to that of the blank when finished, and are respectively made with such outlines as may be found to be best for giving the desired shape to the faces and edges of the blank. One of the patterns will govern the form of the sides and the other that of the edges.

E E′ E^2 E^3, Fig. 2, are the swages, consisting of four steel blocks in the form as shown, and furnished respectively with long shanks F F, which are pivoted to fulcra *c* upon the sides of the carriage C. The ends of two of these shanks extend back to the pattern-cam D, and the shanks of the other two to the cam D′, and are of such length that when the carriage is moved to its nearest point toward the head of the machine the ends of each pair of shanks will be near to the forward ends of their respective cams.

The ends of the four shanks are kept in constant contact with the surface of their cams by means of springs *d d*, located near the several fulcra, as shown. I prefer to use blocks of rubber for this purpose, but metallic springs can be used if desired.

It is evident that as the pattern-cams revolve the four swages will be made to alternately approach toward and recede from each other, and the extent of their movement in both dirctions will be controlled by the form of the pattern-cams, in combination with the counteracting springs.

Underneath the main shaft, and parallel with it is a screw-shaft (not shown in the drawings,) the end of which extends through the front of the frame of the machine, and is furnished with a ratchet-wheel, G, Fig. 3.

A half-nut, operated by the handle H, can be brought at pleasure to engage with the thread of the screw-shaft, and as the nut is by the lever-connection H attached to the carriage C, it follows that as the screw-shaft revolves the carriage will be made to travel along the track upon which it is placed, if the lever H is so adjusted that the threads of the half-nut will engage with those of the rscew.

Motion is communicated to the screw-shaft by motion to the lever I, which is pivoted to the frame at J. Its upper end bears against the face of the cam J upon the main shaft. and its lower end carries the pawl *g*, which, engaging with the teeth of the ratchet-wheel G, causes, as the lever I is vibrated by the revolution of the cam J, the screw-shaft to be turned.

From the foregoing description of the machine it is manifest that if a bar of metal suitable to form a file-blank is held while in a heated state with the shank end bearing

against the end of the main shaft B, and the machine be put into operation, the swages will act as they are caused to travel along the bar to forge it into the shape which the contour of the pattern-cams shall determine. The blank will in consequence come from the operation with its outline properly formed and will require only a blow between the dies of a drop-press to straighten and finish it ready for grinding.

The second part of my invention relates to a means for varying the rate at which the swages shall travel as they are shaping the blank, in order that the motion may be slower at those points where, by the amount of compression required, the resistance is greater. The result is effected by means of a piece or strip, K, attached to the side of the carriage E, whose surface is raised or depressed at those points where, during the movement of the carriage, the ordinary rate of the feed-motion is desired to be changed. A rocker-shaft, L, hung in suitable bearings, *h h*, extends along the side of the frame and carries two fingers, M M′, whose positions on the shaft can be adjusted by set-screws, the former of which fingers presses against the strip K, and the latter is held over the projecting arm, *j*, Fig. 3, of the lever I. When the rocker-shaft L is not turned in its bearings in consequence of the finger M being acted upon by a raised portion of the surface of the strip K, the lever I is permitted to vibrate to its full extent, and the pawl *g* will consequently pass over a greater number of teeth upon the ratchet, and thereby turn the feed-screw farther than when the finger M′ rests upon the projection *j* and limits the range of motion of the lever I in one direction.

I wish it to be understood that the invention described in this patent does not reside in the particular devices employed or in the mere arrangement of the mechanism to produce the ends desired; but it consists in the use of one or more pattern-cams, or their equivalents, for both actuating the swages and at the same time determining the shape of the metal being worked, and also in governing by means of an irregular or varying surface which moves with the swages the rate of speed at which they shall travel over the metal.

It is also obvious that although the machine described is particularly adapted to the purpose of forging a file-blank, it is also capable of being applied without change of principle to forging metal for other and different uses.

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

1. Swaging and shaping a file-blank or similar article by the method and on the principle substantially as described.

2. The method, substantially as described, of regulating and varying the rate of speed at which the devices for swaging the metal shall travel by means of an irregular surface, K, moving with the swages, in combination with the mechanism by which such swages are moved, as herein specified.

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Witnesses:
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