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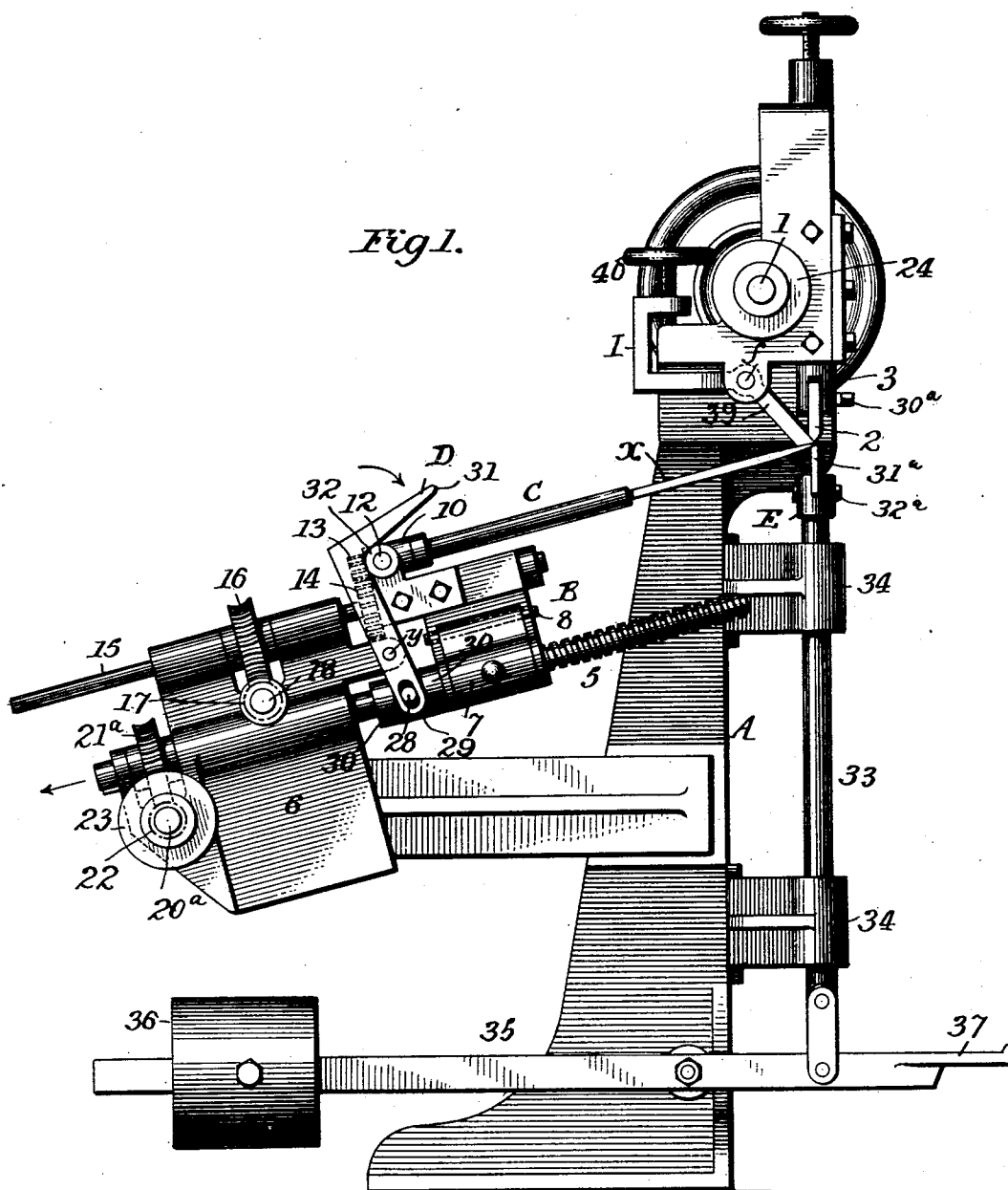
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J. TURNER.
FILE CUTTING MACHINE.

No. 587,885.

Patented Aug. 10, 1897.

Fig. 1.



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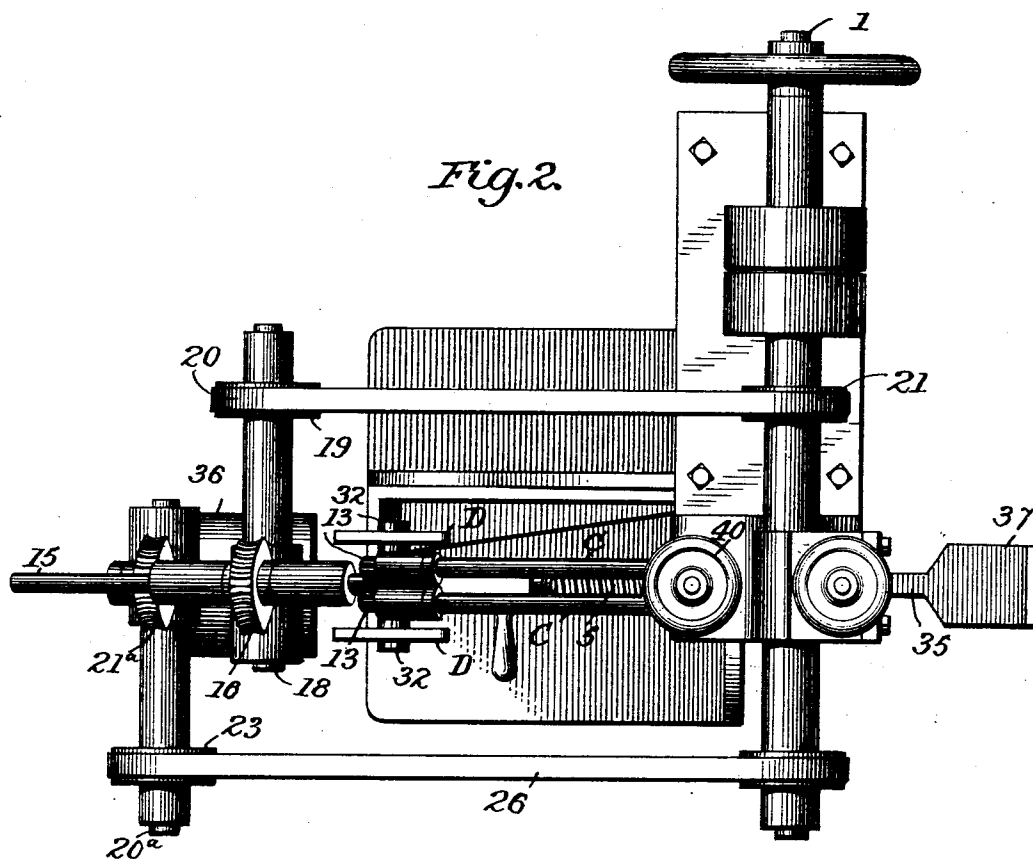
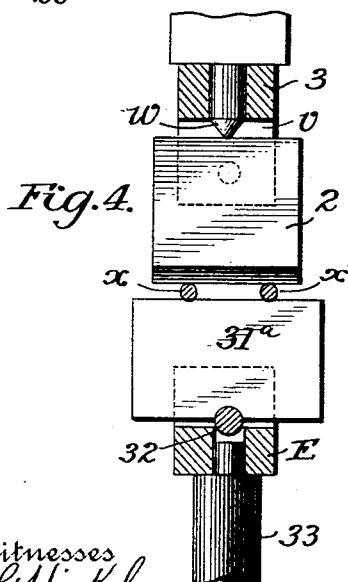
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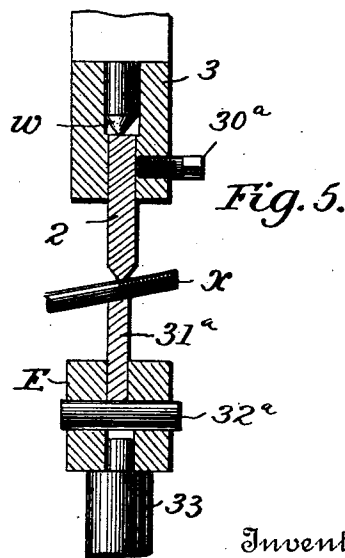
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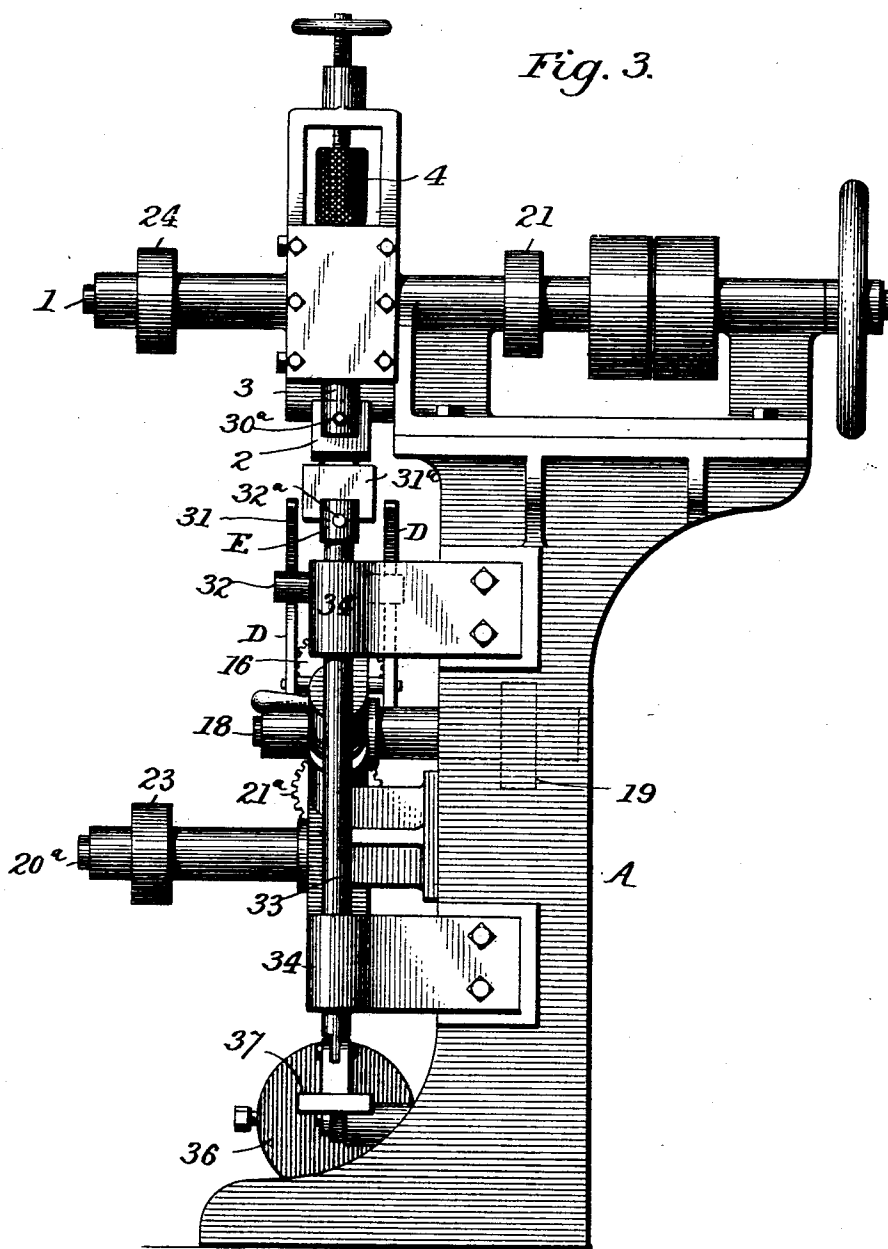
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UNITED STATES PATENT OFFICE.

JAMES TURNER, OF PATERSON, NEW JERSEY, ASSIGNOR TO THE KEARNEY & FOOT COMPANY, OF NEW YORK, N. Y.

FILE-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 587,885, dated August 10, 1897.

Application filed April 13, 1896. Serial No. 587,407. (No model.)

To all whom it may concern:

Be it known that I, JAMES TURNER, a citizen of the United States, residing at Paterson, in the county of Passaic and State of New Jersey, have invented certain new and useful Improvements in File-Cutting Machines, of which the following is a specification.

My invention relates to machines for cutting files, rasps, &c.; and my invention consists in certain improvements in such machines especially adapted for cutting round files and for cutting two round files simultaneously, but some of which improvements are adapted for cutting files of a different character, which improvements are fully set forth hereinafter and illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of my improved machine as constructed for cutting two round files simultaneously. Fig. 2 is a plan view of Fig. 1. Fig. 3 is a front elevation of Fig. 1. Fig. 4 is an enlarged sectional elevation of the cutter and anvil and its adjuncts. Fig. 5 is a transverse section of Fig. 4.

The frame A of the machine is suitably constructed to support the bearings of the main driving-shaft 1, which through the medium of the usual cam lifts the holder or stock 3, which supports the cutter 2, a gum spring 4 throwing down the cutter as usual in this class of machines. The frame also has supports for a sliding carriage B, which carries the blanks to be cut. As shown, there is a screw 5, turning in bearings in a bracket 6, connected to the frame and occupying in this instance an inclined position, and on the said screw travels the carriage B, which is provided with a half-nut 7, pivoted to a pin 8, so that it may be swung outward to release it from engagement with the screw when the carriage may be moved upon the screw.

Where a round file or files must be cut, rotatable file-holders C are supported by the carriage B. As shown, there are two socket-pieces 10 10, each of which swings upon trunnions 12 and through which pass the cylindrical portions of the tool-holders C, and at the rear end of each tool-holder is a pinion 13, which engages with a cog-wheel 14 on a driving-shaft 15, sliding and turning in bear-

ings upon the frame and also sliding in but turning with a worm-wheel 16, which engages a worm 17 upon a shaft 18, turning in the bearings of the bracket 6 and provided with a pulley 19, from which a belt 20 passes to a pulley 21 on the shaft 1. By this means as the carriage B moves forward each tool-holder C is rotated to present different portions of the round file-blank x to the action of the cutter 2.

By pivoting the socket-pieces 10 upon trunnions, as described, a certain amount of vertical play is allowed to the blanks, as is necessary in consequence of the varying thickness of the file-blanks, and it also facilitates the removal of the blanks from the holders when the anvil is carried down, as described hereinafter. This pivotal connection of the blank-holder with the carriage may also be used where flat files are cut and where the holders do not revolve.

The screw 5 is revolved by the rotation of a worm-wheel 21^a, driven by a worm 22 upon a shaft 20^a, which is driven from the shaft 1 through the medium of pulleys 23 24 and a belt 26. In some cases—as, for instance, in cutting round files—it is desirable to have finer teeth, or have the cuts closer together, at the point of the file, and the distance between the cuts gradually increased until the maximum diameter of the file is reached, after which the cuts should be uniformly spaced. In order to do this automatically, I provide means whereby the carriage B at the beginning of operations is not moved forward as rapidly as would result from the normal action of the screw 5, the interference with this action, however, being gradually reduced until the cutter begins to operate upon the maximum diameter of the blank, after which the screw will act normally to move the carriage. Different means may be used to secure this result. As shown, I mount the screw 5 in the bearings in the bracket 6 and in the hub of the worm-wheel 21^a, so that the screw while turning at all times with the wheel may have a limited longitudinal movement therein, and I provide devices whereby the screw is carried back in the direction of the arrow as the carriage B starts forward to

feed the blanks toward the cutter, the forward motion exceeding the extent of the backward motion, and the latter gradually diminishing until the maximum diameter of the blank is beneath the cutter. One means of securing this result consists of a lever D, pivoted at *y* to the bracket and having a forked end with slots for receiving pins 28, projecting from a sleeve 29, arranged between collars 30 30 upon the screw-shaft 5, so that the rocking of the lever D will serve to impart a longitudinal movement to the shaft 5 without interfering with its rotation. At the upper end of the lever is a forwardly-projecting arm 31, having an under inclined face, which bears upon a roller-bearing 32 upon one of the trunnions of one of the holders 10, or there may be two such levers D, as best shown in the plan view, Fig. 2.

The weight of the carriage B and its adjuncts tends to cause the same to move toward the left and therefore swing the upper end of the lever D to the right and keep it in contact with the bearing 32. When, therefore, the shaft 5 is rotated to move the carriage B forward, the bearing 32 is gradually carried below the inclined edge of the arm 31 of the lever D, so that this forward end gradually descends, the lower end of the lever, therefore, moving back and carrying with it the shaft 5, so that although the carriage B is moved forward by the rotation of the said shaft there is a counteraction in the movement of the lever D, carrying the screw-shaft backward, and as a result the carriage and its blank does not at the beginning of operations move forward to the full extent resulting from the rotation of the screw-shaft, but as the bearing 32 gradually passes beneath the arm 31 the movement of the lower end of the lever D backward gradually diminishes until by the time the thicker portion of the file-blank is beneath the cutter the bearing 32 passes from contact with the arm 31, when the carriage B will be moved forward according to the inclination of the screw and the movement thereafter will be uniform.

It will be evident that a like movement may be imparted to the carriage if the latter supports the holders of flat or half-round or other files which are not rotated, the same result as secures the closer cutting of the points being secured. In order to increase the capacity of the machines, I prefer to make use of two holders for carrying two blanks, as shown. One objection to attempts to cut two blanks simultaneously heretofore has been the fact that sometimes one blank is a little thicker than the other or is supported so as to project above the other, in which case one of the blanks is apt to receive a deeper cut than the other. In order to avoid such results, I make use of a cutter which will swing upon the holder or stem to such an extent as to operate uniformly upon both of the blanks. The cutter may be secured to the holder in any suitable manner to secure this result. As

shown, the cutter 2 is a flat blade with a proper beveled lower edge and extends into a slot in the holder wherein there is a single bearing-point *w* at about the center of the cutter at the opposite edge, so that as the cutter is brought against the file-blanks it will take an equal bearing upon the two and cut each to the same extent as the other. The cutter is preferably held frictionally in its place in the holder by means of a set-screw 30^a, which while it prevents the cutter from moving under ordinary circumstances will not interfere with its tilting if one of the blanks should be slightly thicker than the other or at a greater elevation. As the cutter extends into a slot *v* open at both sides, the said cutter may be adjusted laterally, so that if it wears at one point it may be brought to a position to bring different parts of the edge into operation, thereby avoiding the necessity of replacing the cutters frequently.

To still further accommodate the machines to operations at one time upon two files, I make use of a rocking anvil 31^a, consisting of a blade supported by a holder E and having a curved socket or notch at the lower edge for a cross-pin 32^a of the holder, which permits the anvil to rock to a limited extent to accommodate itself to the position of the file-blanks resting thereon.

The anvil is not held rigidly in place, but the holder E is at the upper end of a rod 33, which slides in brackets 34 upon the frame and is connected at the lower end with a lever 35, having a weight 36 at its rear end, which tends to lift the anvil, and having a foot-piece 37 at the front end, so that by placing the foot on the piece 37 the anvil may be depressed to permit the insertion or removal of the blanks.

In order to regulate the effect of the cutter, I make use of a vertically-movable foot-piece 39, which bears upon the blanks just back of the cutter, and by adjusting this to different positions I regulate the depth of the cut, as by setting the blank farther down the effect of the cutter is reduced. As shown, the foot-piece 39 is a part of a lever I, pivoted at *f* to the overhanging part of the frame A, and this lever is provided with an adjusting-screw 40, by which the angle may be altered so as to depress the foot-piece 39 more or less. Any other suitable mode of adjustment may be adopted.

When the blanks pass under the stationary foot-piece, which is behind the cutter, if one blank is larger in diameter than the other the anvil will adapt itself to the inequality, so that the cutter does not always have to move on its center.

While I have shown my improvements in connection with means for supporting and turning two round file-blanks, it will be evident that they may be used in connection with a single file-holder and in some instances in connection with holders for flat or half-round blanks.

Without limiting myself to the precise construction and arrangement of parts shown and described, I claim as my invention—

1. The combination in a machine for cutting files or rasps, of a reciprocating cutter, a carriage, a screw for moving the carriage forward, and means whereby the screw is permitted to move backward with a diminishing action at the beginning of operations, substantially as described.

2. The combination in a machine for cutting files or rasps, of a reciprocating cutter, a carriage, devices for feeding the carriage forward, and means whereby the said devices are permitted to have an independent backward movement at the beginning of operations, substantially as shown and for the purpose described.

3. The combination in a machine for cutting files, &c., of a reciprocating cutter, an inclined screw and means for rotating the same, a carriage engaging said screw, a lever pivoted to a stationary part of the frame and having bearings upon the screw, and with an inclined end bearing upon the carriage, substantially as set forth.

4. The combination with the reciprocating cutter and carriage, of pivoted supports 10, holders C turning in said supports, and means for turning the holders in the supports, substantially as set forth.

5. The combination with the carriage B, pivoted supports 10, holders C turning therein, shaft 15 and means for rotating the same, and gears between the shaft 15 and the holders C, substantially as set forth.

6. The combination in a machine for cutting files, &c., of a reciprocating cutter-holder

3, a cutter consisting of a blade 2, a bearing *w* for the upper edge of the cutter, and means 40 for securing the cutter frictionally in the holder, substantially as set forth.

7. The combination in a machine for cutting files, &c., of supports for two parallel file-blanks, and means for feeding the same, 45 a reciprocating cutter-holder, and a cutter secured in said holder and having a single bearing-point *w*, substantially as and for the purpose set forth.

8. The combination in a machine for cutting files, &c., of a reciprocating holder and cutter, and an anvil consisting of a blade 31, and a slotted holder therefor having a single bearing-point for the said anvil upon which the same may rock in the slot, substantially 55 as and for the purpose set forth.

9. The combination of the anvil-holder E, the anvil 31 having a single bearing-point so as to rock in said holder and a counter-weighted support for the holder, substantially 60 as set forth.

10. The combination in a machine for cutting files, of a reciprocating cutter, an anvil, having a single bearing-point, an anvil-holder, and means for depressing the same, a carriage 65 and a file-blank holder pivoted to said carriage, substantially as and for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES TURNER.

Witnesses:

JAMES D. FOOT,
CHARLES E. WATTS.