

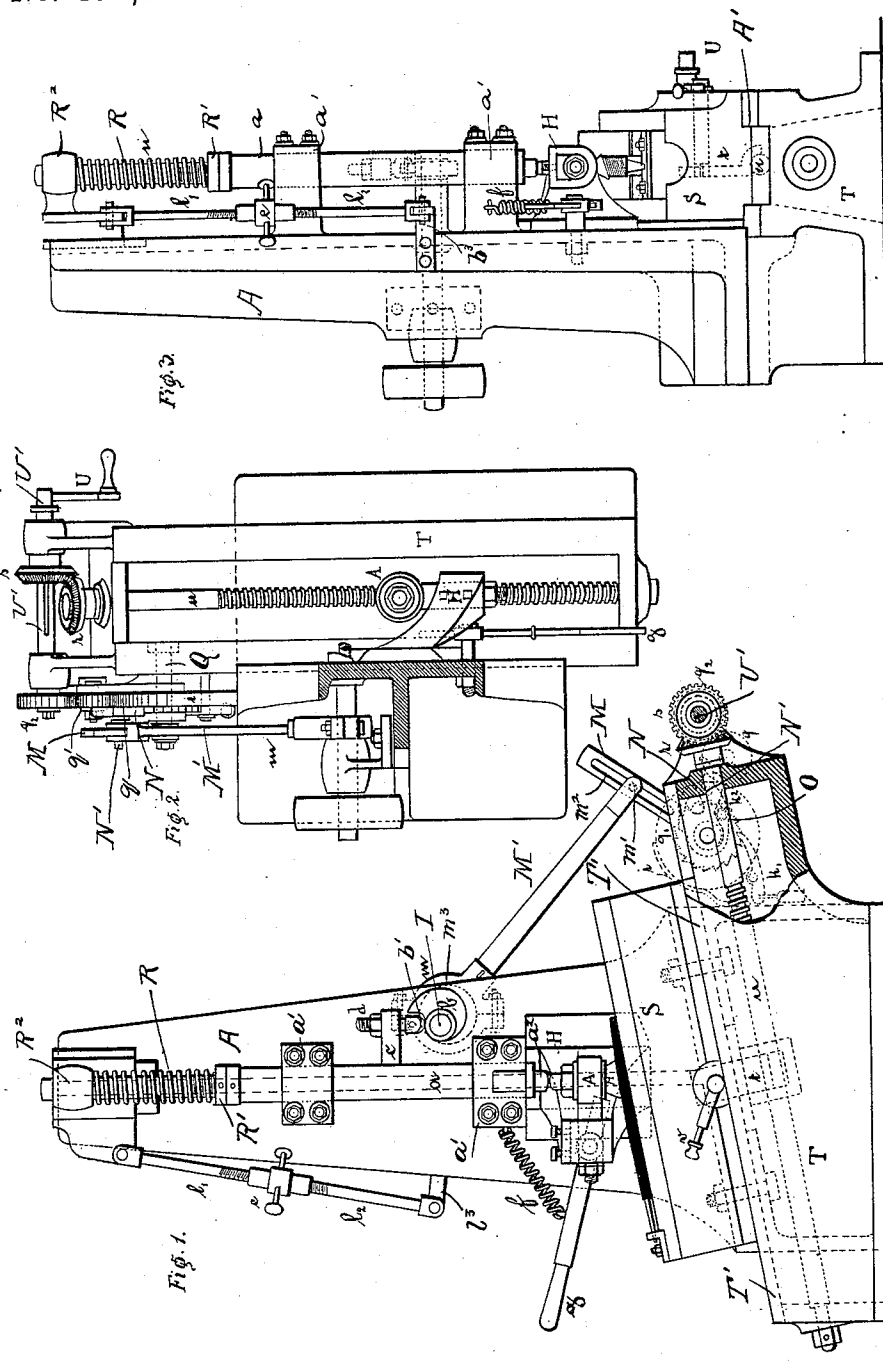
(No Model.)

2 Sheets—Sheet 1.

P. HEINTZ.
FILE CUTTING MACHINE.

No. 471,219.

Patented Mar. 22, 1892.



Witnesses
W. Harvey Muzzy
E. J. Cullen

Inventor
Peter Heintz
By W. H. Babcock
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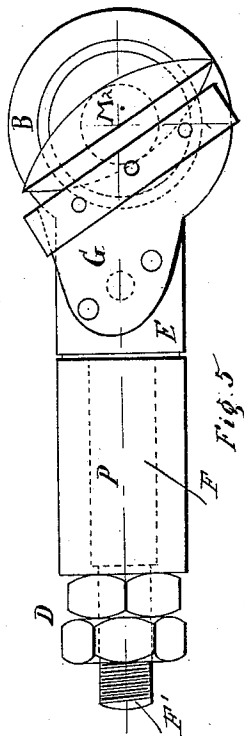
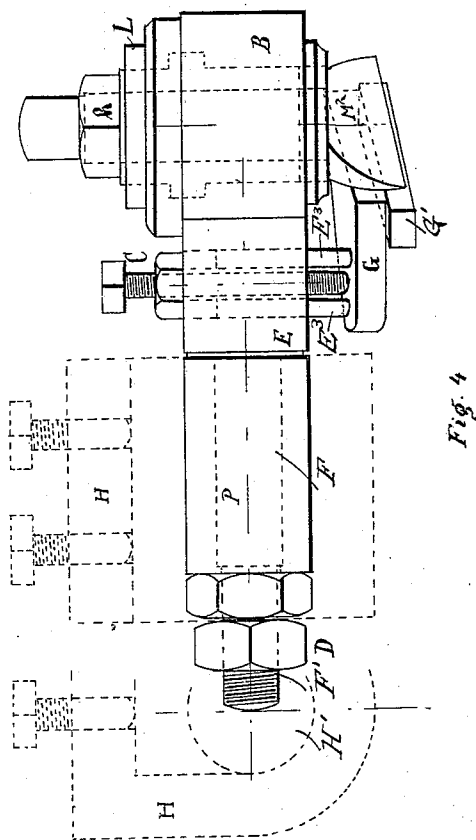
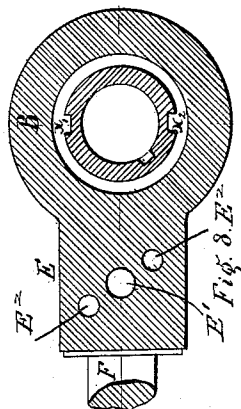
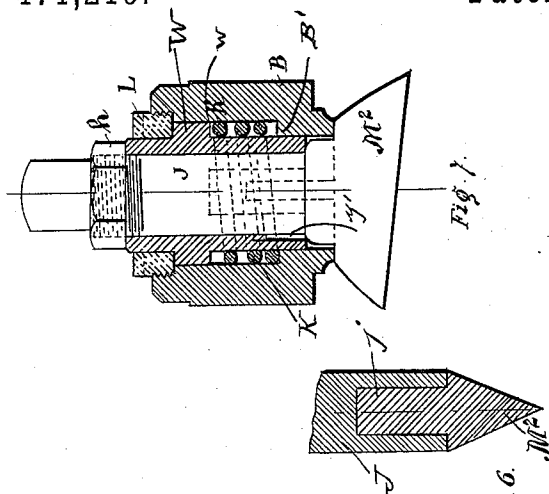
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2 Sheets—Sheet 2.

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UNITED STATES PATENT OFFICE.

PETER HEINTZ, OF LUDWIGSHAFEN, GERMANY.

FILE-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 471,219, dated March 22, 1892.

Application filed September 25, 1891. Serial No. 406,860. (No model.) Patented in France April 20, 1891, No. 212,884; in Belgium May 28, 1891, No. 95,025, and in England August 12, 1891, No. 13,591.

To all whom it may concern:

Be it known that I, PETER HEINTZ, a citizen of Germany, residing at Ludwigshafen-on-the-Rhine, Bavaria, Germany, have invented certain new and useful Improvements in File-Cutting Machines, (patented in England, No. 13,591, dated August 12, 1891; in France, No. 212,884, dated April 20, 1891, and in Belgium, No. 95,025, dated May 28, 1891;) and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in file-cutting machines in which a cutting-tool is struck by a reciprocating plunger, the file being fed under it.

The said invention consists in the construction and combination of devices hereinafter particularly set forth and claimed.

In the accompanying drawings, Figure 1 represents a front elevation of a machine embodying my invention. Fig. 2 represents a plan view of the same. Fig. 3 represents a side elevation of the same. Fig. 4 represents, on a larger scale, a detail side elevation of the tool-holder. Fig. 5 represents a bottom view of the same. Fig. 6 represents a detail sectional view of the tool-point. Fig. 7 represents a vertical sectional view of the tool-holder, showing the tool itself in elevation; and Fig. 8 represents a horizontal section of the tool-holder.

In the accompanying drawings, A designates the frame of the machine, and T a bed or table formed therewith. The top of this table is inclined, as shown, and provided with a guideway T', in which travels a sliding file-support S, with a downwardly-extending nut t that receives a screw-threaded rod or shaft u for causing the forward motion of the said sliding support up the said inclined guideway. To effect this, one end of the said rod or shaft u is provided with a bevel-wheel r, gearing with a bevel-wheel s on a shaft U', operated by a handle U. This shaft is also provided with a spur gear-wheel q², meshing with a similar wheel q', which in like manner meshes with and is driven by a gear-wheel q on a shaft Q. This shaft is also provided

with a ratchet-wheel O, operated by a pawl N in a step-by-step motion, this pawl being mounted on a short shaft N', provided with a longitudinally-slotted arm M. The slot m² of this arm is engaged by a pin m' on a connecting-rod M', formed with a yoke m, surrounding a cam m³ on the driving-shaft I of the machine. Through the succession of devices above enumerated the said driving-shaft operates the said ratchet-wheel and causes the screw-threaded rod v to feed forward and upward the sliding support S. The return motion of the latter device is caused by its own weight, it being on the inclined guideway, as stated. To allow this, the nut t is lifted by a lever v, so as to disengage it from the screw-threaded rod u, the said nut being peculiarly shaped, as shown in Fig. 3, to allow such disengagement. The driving-shaft and above-described connections are used as a rule for the reciprocation of the said sliding support, the handle V being only employed under special circumstances. A retaining-pawl k' engages the said ratchet-wheel and prevents it from turning back. A brake-spring i, bearing against the periphery of wheel q', prevents it from moving accidentally. The said driving-shaft also carries a cam b, which operates against an anti-friction roller b', attached by a bolt d to a rigid lug c, extending laterally from a plunger a. This last reciprocates vertically in guides a', attached to the frame A, the action of cam b lifting the said plunger and a strong spring R forcing the said plunger down again. This spring surrounds the upper part of the said plunger and bears at lower end against a shoulder R' thereon and at its upper end against a block R². This block is vertically adjustable to vary the tension of the said spring by means of a hand-nut e and two reversely-screw-threaded rods l' l², one of which is attached to the said block and the other to a bracket or lug l³, extending rigidly from the said frame. The said nut engages the contiguous screw-threaded ends of the said rods. The lower end of the said plunger has a driving hammer-head a² fixed in its lower end for driving a tool against the file-blank and cutting the same to complete the file.

The tool which I use and illustrate consti-

tutes, with its supporting devices, an important feature of my invention. It consists of two parts made detachable—a blank M^2 of suitable form and a shank J, into which a small stem j of the said blade is socketed. When the blade wears out or is broken, it may be removed from the said shank and another may be put in its place without the need of substituting a new tool. The upper end of the said shank is screw-threaded to receive a nut h , which fastens a sleeve W upon it. This sleeve has a collar w formed on it near its upper end, against which bears a loose collar L, externally-screw-threaded for engaging screw-threads in the upper end of a tubular cylindrical stock B, thus preventing the said sleeve and shank from raising out of the said stock. The lower part of the said stock has an internal annular shoulder B' formed on it.

In the space between the collar w and shoulder B' a helical spring k (for which a rubber ring may be substituted) is placed, bearing against the said shoulder at one end, and the said collar at the other end operating to raise the said tool and its attachments after each stroke.

The shank J of the tool is provided with a lateral pin y' , which enters a vertical groove in the internal face of the sleeve W and prevents the shank from turning therein. The said sleeve is provided also with vertical external grooves x' x^2 to receive corresponding lugs or ribs on the interior of the tubular stock B, so that the said sleeve cannot turn therein. The stem j is so firmly fitted into the socket of the shank J that the blade M will not be dislodged by the ascent of the shank or loosened by the jar of the plunger and its hammer in striking the said tool. The tubular stock B aforesaid is provided with horizontal extension E, formed with three vertical holes, the middle and the largest hole being designated E' and the others E². Through the former extends a vertical adjusting-screw C, and through the latter extend two rods E³, these and the screw C being connected to a flat guide-plate G, having a broad rigid foot G' for preventing the file from rising out of position while it is being fed forward and cut. The holes E' E² extend from the bottom of the said extension E up to a recess in the top of the latter, (indicated in Fig. 4,) which receives a nut Z and allows the same to turn on the screw C. By turning the nut Z the guide-plate G is raised or lowered at will to lessen or increase the pressure on the file.

The extension E is provided with a cylindrical horizontal stem F, having a reduced screw-threaded tip F', that receives two nuts D, whereby a sleeve P is locked in place on the said stem. This sleeve fits within a bearing H' in a supporting-block H, the latter being vertically movable in guides, as indicated in Figs. 1 and 2, and depressed by the action of spring f on lever g , the said spring forcing

the free end of the lever down upon a part of the said block. The effect of this is to automatically clamp the file by the pressure thereon of the clamping-plate already described.

The operation of the machine is as follows: The file-blank is fed forward under the tool by forward motion of its sliding support and cut by the strokes of the said tool to complete the file, the guide-plate before described lightly holding the file on the top of the said sliding support, but not preventing its forward motion. When the operation of cutting is completed, the file returns to its first position, as before stated, and is removed by hand, a new blank taking its place.

The construction of the tool-holding devices hereinbefore described allows the tool to oscillate freely, so as to follow all irregularities or variations of thickness of the file without impairing the accuracy and neatness of the work.

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

1. In a file-cutting machine, the combination, with the frame of the machine, of a file-carrier mounted on an inclined plane, a worm-gear, ratchet and cam connection between said carrier and the power-shaft, whereby said carrier is advanced in a step-by-step motion, a spring-actuated plunger, a cam oscillating said plunger, a movable cutting-tool holder, a cutting-tool movably mounted therein and arranged to be struck by said plunger, a file-steadying shoe rigidly but adjustably mounted in said tool-holder, and a lever and spring holding said shoe through the agency of said holder firmly against the file, all substantially as and for the purpose set forth.

2. In a file-cutting machine, the combination, with the frame of the machine, of a spring-actuated plunger, adjusting devices for varying the tension of said spring, a cam for oscillating said plunger, a movable file-carrier, connections between said carrier and the driving-shaft, whereby a step-by-step motion is imparted to said carriage, a cutting-tool movably mounted in a holder and arranged to be struck by said plunger, an adjustable shoe mounted in said holder, and a spring and lever for holding said shoe on said file when the stroke is made, all substantially as and for the purpose set forth.

3. In a file-cutting machine, the combination, with the frame of the machine, of a spring-actuated plunger, a cam for oscillating the same, a file-carrier, actuating connections between said carrier and the power-shaft, a cutting-tool arranged to be struck by the said plunger and consisting of a recessed shank, a cutter proper fitting into said shank, a shouldered sleeve secured around said shank, a supplemental sleeve placed around said former sleeve, and a spring bearing against said shouldered sleeve and a shoulder of a

holder which contains the whole, said holder engaging said supplemental sleeve, all substantially as and for the purpose set forth.

4. In a file-cutting machine, the combination,
5 with a file-carrier, of an oscillating plunger and a cutting-tool arranged to be struck by said plunger, said tool consisting of a recessed shank, a cutting-tool proper fitting therein, a shouldered sleeve secured around
10 said shank, a supplemental sleeve placed around the top of said former sleeve, and a spring bearing against said shouldered sleeve

and a shoulder of a holder which surrounds the whole, said holder engaging said supplemental sleeve, all substantially as and for the 15 purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

PETER HEINTZ.

Witnesses:

AUGUST DIETTERICH,

Of Ludwigshafen-on-the-Rhine,

R. H. GROSS,

Of Mannheim.