

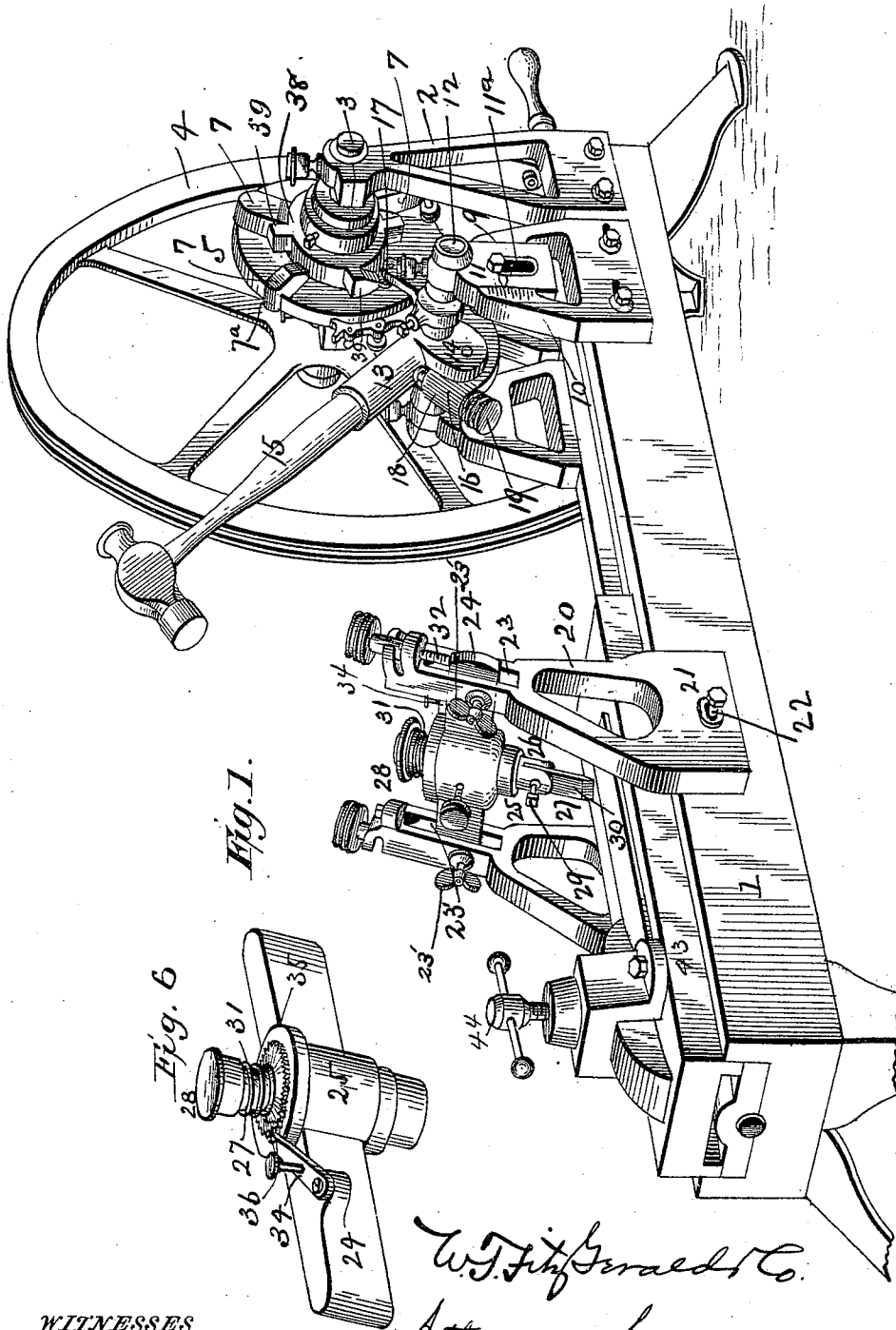
(No Model.)

4 Sheets—Sheet 1.

E. SWEET.  
FILE CUTTING MACHINE.

No. 461,720.

Patented Oct. 20, 1891.



WITNESSES  
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(No Model.)

4 Sheets—Sheet 2.

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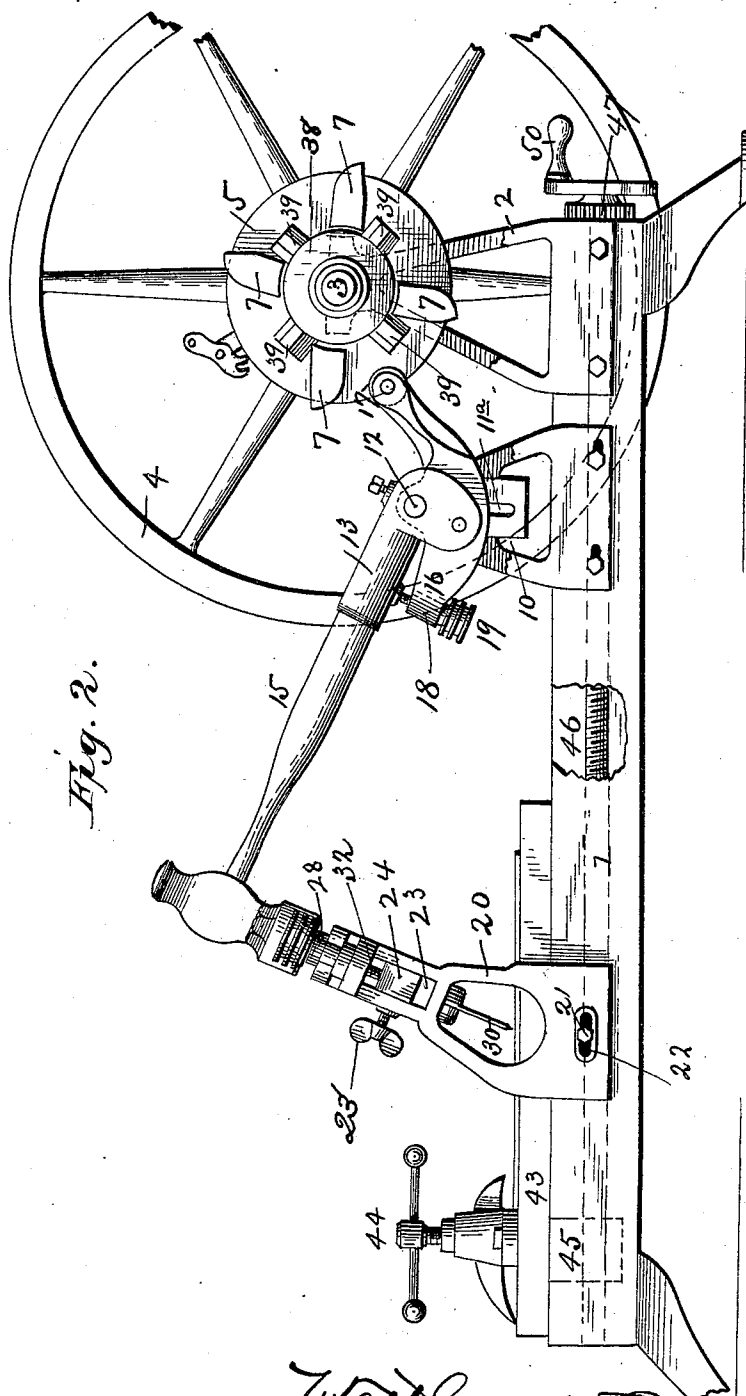


Fig. 2.

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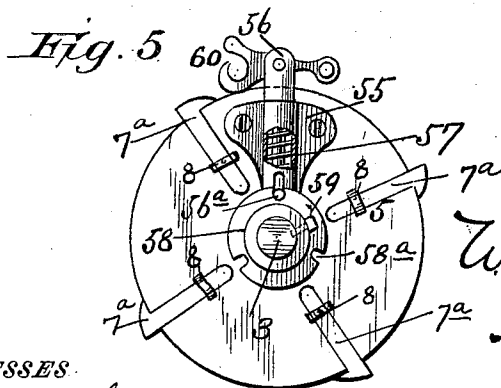
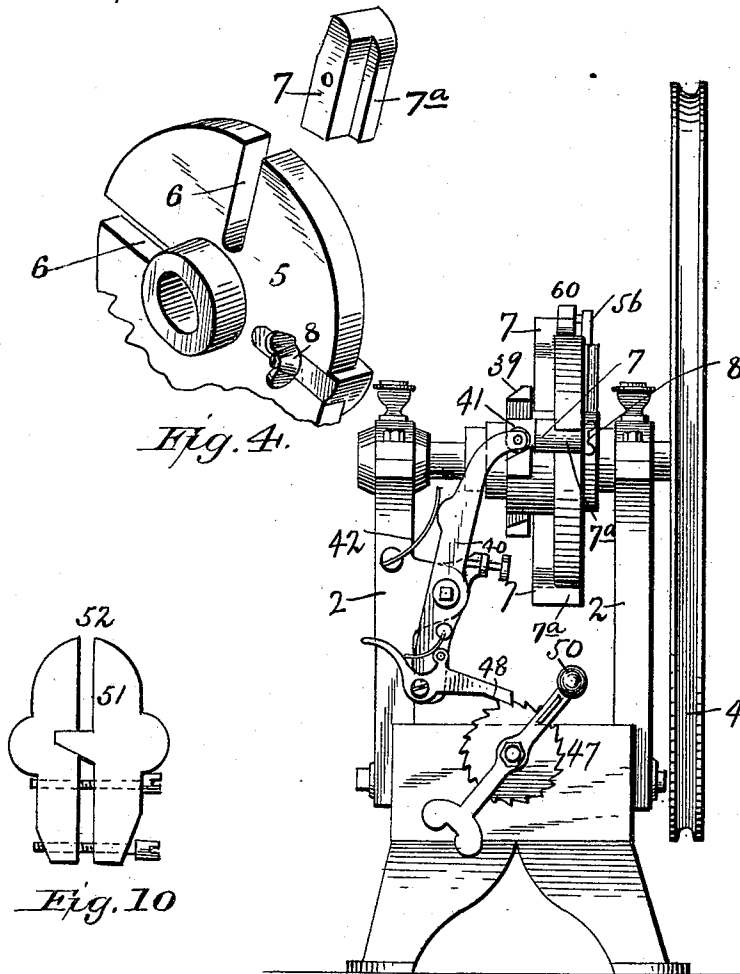
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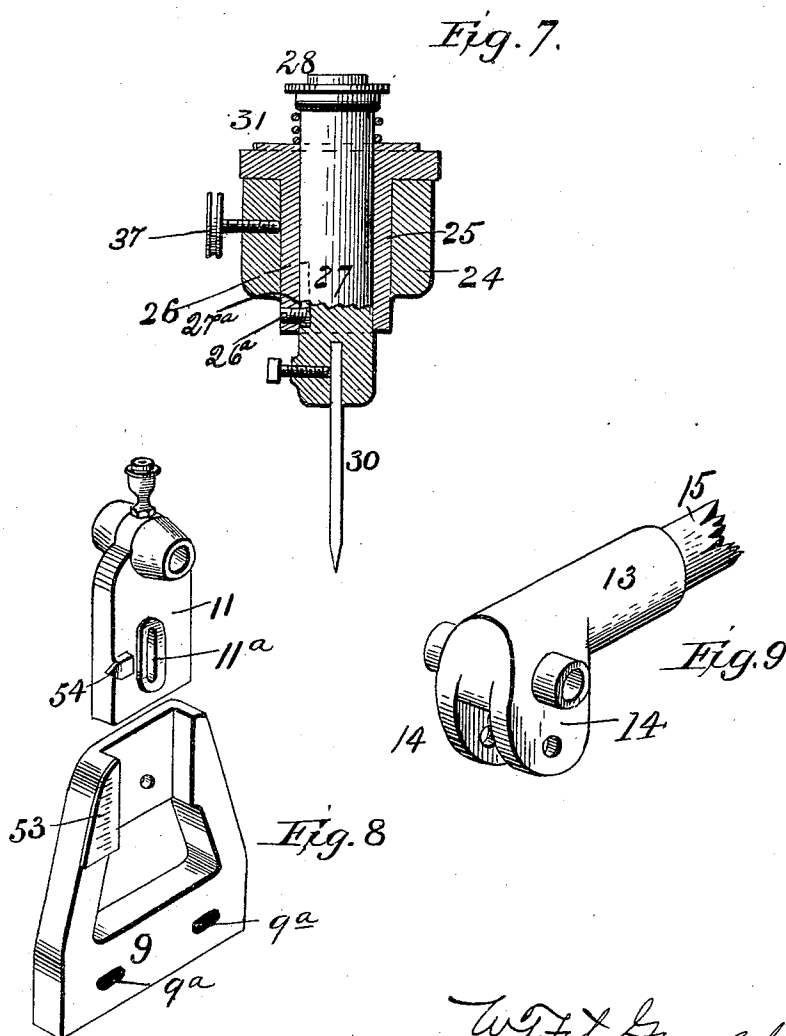
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# UNITED STATES PATENT OFFICE.

ELI SWEET, OF ATHENS, PENNSYLVANIA.

## FILE-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 461,720, dated October 20, 1891.

Application filed June 22, 1891. Serial No. 397,103. (No model.)

*To all whom it may concern:*

Be it known that I, ELI SWEET, a citizen of the United States, residing at Athens, in the county of Bradford and State of Pennsylvania, have invented certain new and useful Improvements in File-Making Machines; 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.

My invention consists in a new and improved file-making machine, which works with extreme rapidity and accuracy and in which every operative part is capable of the most delicate and exact adjustment.

My invention contains many novel and valuable features, which will be hereinafter fully described and claimed.

Referring to the accompanying drawings, Figure 1 is a perspective view of my new and improved file-making machine. Fig. 2 is a side elevation of the same. Fig. 3 is a rear elevation showing the feeding mechanism. Fig. 4 illustrates, on an enlarged scale, the hammer-operating disk. Fig. 5 is a detail view taken from the outer side of the disk 5 and illustrating the clutch mechanism. Fig. 6 illustrates in detail, on an enlarged scale, a part of the chisel holding and adjusting mechanism. Fig. 7 is a vertical sectional view taken through the center of Fig. 6. Fig. 8 illustrates in detail, on an enlarged scale, one of the adjustable bearing-supports for the hammer. Fig. 9 is an enlarged detail view of the hammer-socket. Fig. 10 illustrates in detail the auxiliary clamp 51.

Referring to the several parts by their designating numerals, 1 indicates a suitable supporting bed or frame upon standards 2 2, at the rear end of which is mounted in bearings a transverse drive-shaft 3, a large band-wheel 4 being secured on one end of this drive-shaft. Upon the drive-shaft is mounted a disk 5, formed with four radial slots 6, arranged at equal distances apart. In these radial slots fit the reduced side 7<sup>a</sup> of the adjustable cams 7, which are adjustably held in position by the set-screws 8, which screw into the cams from the outer sides of the disk with their broad heads pressing against the outer side of the slotted disk, as most clearly shown in

Fig. 5 of the drawings. The operative faces of the cams are curved out to their ends, as shown, for the purpose hereinafter specified.

9 9 indicate standards which are bolted to the bed-frame 1, just in front of the standards 2, and which are formed on their outer sides with the recesses 10, in which fit movably the adjustable bearing-blocks 11, in the upper ends of which the hammer-shaft 12 is mounted. Upon this shaft is rigidly secured the hammer-socket 13, (shown in detail in Fig. 9,) in which the handle of the hammer 15 is secured, this socket being formed with the downwardly-extending lugs 14 14. Between these lugs is centrally pivoted the curved arm 16, the rear end of which extends up slightly beyond the periphery of the disk 5 and is there provided with the pivoted anti-friction roller 17, (see Fig. 2,) while in a bearing 18 in the forward end of the arm is fitted an adjustable screw 19, having a suitable head at its lower end for convenience in turning it with the fingers, while its upper round end is adapted to come in contact with the under side of the hammer-socket 13.

Near the forward end of the bed-frame 1 are adjustably secured the standards 20 by means of bolts 21 passing through transverse slots 22 in their lower ends, and the upper inclined ends of the standards are formed with the inclined slots 23, through which pass the ends of a cross-head 24. (Shown in detail in Fig. 6.) In the center of this cross-head is formed a round bore or opening 25, in which fits the tubular chisel-socket 26, having an edge-flange at its upper end, which holds it up in position in the cross-head. Through the chisel-socket passes the sliding chisel bar or holder 27, having a suitable head 28 at its upper end to receive the blows of the hammer and having its lower end slotted and provided with the set-screw 29 to receive and hold the chisel 30.

31 indicates a spiral spring, which encircles the upper end of the chisel-bar 27 and raises the same as soon as the hammer is lifted from off it. In the ends of the cross-head 24 are swiveled the lower ends of adjusting-screws 32, by turning which the cross-head can be raised or lowered, according to the thickness of the file on which the chisel is to operate.

When the ends of the cross-head are thus adjusted, they are positively secured by tightening or screwing in the set-screw 23'. The chisel-socket 26 can be turned in the cross-head to cause the chisel to make either straight or slanting cuts on the file, and when so turned or adjusted it is held by a spring-catch 34, which is pivoted, as shown, on the top of the cross-head, with its pointed inner end engaging in a series of notches 35, formed in the top of the chisel-socket. By lifting the free end of the spring-catch 34 by a knob 36 on its inner end the said end can be raised to free it from the notches 35, thus enabling the socket to be turned around to the desired point. The set-screw 37 will positively secure the chisel-socket after the latter has been adjusted. A guide-pin 26<sup>a</sup> in the lower end of the chisel-socket 26 enters a vertical recess 27<sup>a</sup> in the chisel-bar 27 and causes the chisel-bar to turn with the socket 26 when the latter is adjusted and prevents the chisel-bar from turning around in the socket.

It will now be seen that as the drive-wheel 4 revolves as the curved end of each cam 7 comes in contact with the rear end of the pivoted arm 16, it will raise the forward end of said arm, which is in contact with the hammer-socket, and the hammer will thus be raised, and as the pointed end of the cam passes from under the rear end of the arm the hammer will drop and strike upon the head of the chisel-bar 27, and as the disk 5 is provided with four cams 7 it will be seen that the chisel 30 will make four cuts on the file for each single revolution of the drive-wheel 4.

It will be seen that by turning the adjusting-screw 19, mounted in the forward end of the pivoted arm 16, (the upper end of which comes in contact with the hammer-socket,) that the stroke of the hammer can be regulated so that it will strike either a light or heavy blow, the delicate adjustment of the set-screw giving a correspondingly delicate adjustment of the force or blows of the hammer, which is one of the special and most valuable features of my invention.

The bolts which secure the hammer-standards 9 pass through transverse slots 9<sup>a</sup> in the lower end of said standards, which construction admits of the adjustment of the hammer-shaft and hammer on the bed-frame.

The bearing-blocks 11, in the upper end of which the hammer-shaft is mounted, are formed with the vertical slots 11<sup>a</sup>, through which pass the threaded bolts which secure them in the recessed standards 9, and it will be seen that by loosening said threaded bolts that the hammer-shaft can be raised or lowered, thereby adjusting the height from which the hammer will fall, and thus regulating the strength of its blow, raising it for heavy blows and lowering it for light ones. The cams 7 can also be adjusted in or out to regulate the force of the hammer-blows; but the final delicate adjustment is obtained by the adjusting-screw 19, as above described. Upon the hub

of the disk 5 is secured a collar 38, from which project four feed-cams 39, the forward ends of which are beveled, as shown. Upon a projection of one of the rear standards 2 is centrally pivoted the upright feed-arm 40, which is most clearly illustrated in Fig. 3, the upper inwardly-curved end of which is provided with an anti-friction roller 41, which comes in contact with the inclined ends of the feed-cam 39. A spring 42, arranged as shown, serves to keep the upper end of the feed-arm in the path of the feed-cams. The file being cut is supported upon a carriage 43, which is mounted and travels upon the bed-frame 1, the file being held firmly by a screw-clamp 44, secured on one end of the carriage. The carriage is formed on its underside near each end with the threaded bearings 45, through which the long feed-screw 46 passes, this screw being mounted in bearings in the ends of the bed-frame 1. Upon the rear end of the feed-screw is keyed a ratchet-wheel 47, the inclined teeth of which are engaged by the inner end of a spring-actuated pawl 48, pivoted to the lower end of the feed-arm 40, as shown. The feed-cams 39 are so arranged (with relation to the cams 7 of the disk 5) that as one of the cams 7 is raising the hammer the feed-cam at the opposite side of the disk will be pressing the upper end of the feed-arm 40 outward, and the lower end of said arm, through its pawl 48, will be turning the feed-screw, and thus feeding the carriage 43 and the file on it forward for the next cut. It will thus be seen that the file will be automatically fed forward every time that the hammer rises ready for the next blow of the hammer on the chisel. The length of the stroke of the feed-arm, and consequently the distance which the carriage will move between each stroke, can be adjusted to the finest degree by turning a set-screw 49, the inner end of which comes in contact with the inner side of the upper end of the feed-arm above the pivotal point of the same. The ratchet-wheel 47 on the rear end of the feed-screw may be exchanged for one having a different number of teeth, and the speed of the feed-screw will of course be regulated according to the number of teeth on said ratchet-wheel. A crank-handle 50 is secured on the rear end of the feed-screw, and when the carriage has reached the end of the bed-frame 1 the pawl 48 is raised and the feed-screw is turned around to the left by means of this handle, thus bringing the carriage back to its starting-point.

When the file is to be held edgewise, in order to make the cuts along its edge, I employ the auxiliary clamp 51, (shown in Fig. 5,) which is clamped in the screw-clamp 44, and will hold the file with its edge upward between its jaws 52.

Upon the side of one of the recessed standards 9 a suitable scale 53 is preferably arranged, and a pointer 54 is attached to that adjustable bearing-block 11, extending over the scale, so that the exact point to which the

hammer-shaft should be raised, according to the length of the stroke desired, can be exactly seen.

The drive-wheel and drive-shaft are continuously revolved by the belt from the engine; but the machine can be thrown into or out of gear (the disk 5 being loosely mounted on the drive-shaft) by means of any suitable clutch, the form which I have shown being preferably used. Upon the outer side of the disk 5 is secured a curved bearing-plate 55, within which is mounted the locking-pin 56, and also a spiral spring 57, which is secured at its inner end in the casing and at its outer end to the clutch-pin 56, so that it will press the said pin inward. Upon the revolving drive-shaft 3, immediately to the outer side of the disk 5, is secured, by means of the set-screw 59, passing through its hub, a short disk or collar 58, in which are formed three equidistant recesses 58<sup>a</sup>, which are adapted to receive the lower outwardly-bent end 56<sup>a</sup> of the clutch-pin 56. To the upper end of the clutch-pin is pivoted a cam-lever 60.

When the cam-lever is turned down, as shown in Fig. 5, the pressure of the clutch-spring 57 holds the lower end of the clutch-pin fitted firmly within one of the recesses 58<sup>a</sup> of the fixed collar 58, and the disk 5 is then in gear and will revolve with the drive-shaft.

To throw the machine out of gear, it is only necessary to turn the pivoted cam-lever up, as shown in Fig. 2, thus raising the clutch-pin 56 out of the collar-recess 58<sup>a</sup>, when the drive-shaft and collar 58 will revolve without turning the disk 5.

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

1. In a file-making machine, the combination, with the revolving disk having the curved cams and the hammer having its pivoted socket 13, formed with the downwardly-extending lugs 14, of the curved arm 16, pivoted between said lugs and having at its forward end the adjustable screw 19 for regulating the force of the hammer-strokes, substantially as set forth.

2. The combination, with the revolving disk having the curved cams and the curved arm 16, of the hammer having its pivoted socket formed with the downwardly-extending lugs pivotally connected to the curved arm, and a suitable means for regulating the force of the hammer-strokes, substantially as and for the purpose set forth.

3. The combination, with the bed-frame, of

the adjustable recessed standards 9, the slotted bearing-blocks 11, adjustably mounted in the said recessed standards, the hammer having the socket formed with the lugs 14 and pivotally mounted in said bearing-blocks, the curved arm pivoted between the socket-lugs 14 and having the adjusting-screw 19 in its forward end, and the revolving disk 5, having the adjustable cams 7, substantially as set forth.

4. The combination, with the pivoted hammer having the pivoted arm 16 and the chisel operated by said reciprocating hammer, of the revolving disk having the cams 7, the collar 38, revolving with said disk and having the inclined feed-cam 39, the carriage 43, provided with a file-clamp and having the threaded bearing 45, the feed-screw 46, having the ratchet-wheel and the crank-handle, and the centrally-pivoted spring-actuated feed-arm 40, having the spring-actuated pawl 48 pivoted at its lower end, substantially as set forth.

5. In a file-making machine, the combination, with the traveling carriage and the reciprocating hammer, of the adjustable inclined standards 20, having the slots 23 in their upper ends, the cross-head 24, having its ends working in said slots, the sliding chisel-bar 27, mounted in the cross-head, carrying the file at its lower end and having the lifting-spring 31 encircling its upper end, the adjusting-screw 32, and the binding-screw 33, substantially as and for the purpose set forth.

6. The combination of the inclined supporting-standards 20, the adjustable cross-head 24, having the central bore 25, the tubular adjustable chisel-socket 26, having the series of notches 35 at its upper end, a catch 34, adapted to engage in said notches, the set-screw 37, and the spring-actuated chisel-bar 27, carrying a chisel in its lower end and sliding it, and the socket 26, substantially as set forth.

7. The combination, with the revolving drive-shaft and the operating-disk 5, loosely mounted thereon, of the small disk 58, immovably secured upon the drive-shaft and formed with the recesses 58<sup>a</sup>, the curved bearing-plate 55, the spring-actuated clutch-pin 56, adapted to engage with the small recessed disk 58, and the cam-lever 60, pivoted to the upper end of the clutch-pin, substantially as set forth.

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

ELI SWEET.

Witnesses:

HARRY D. BULL,  
ELLERY HAMMOND.