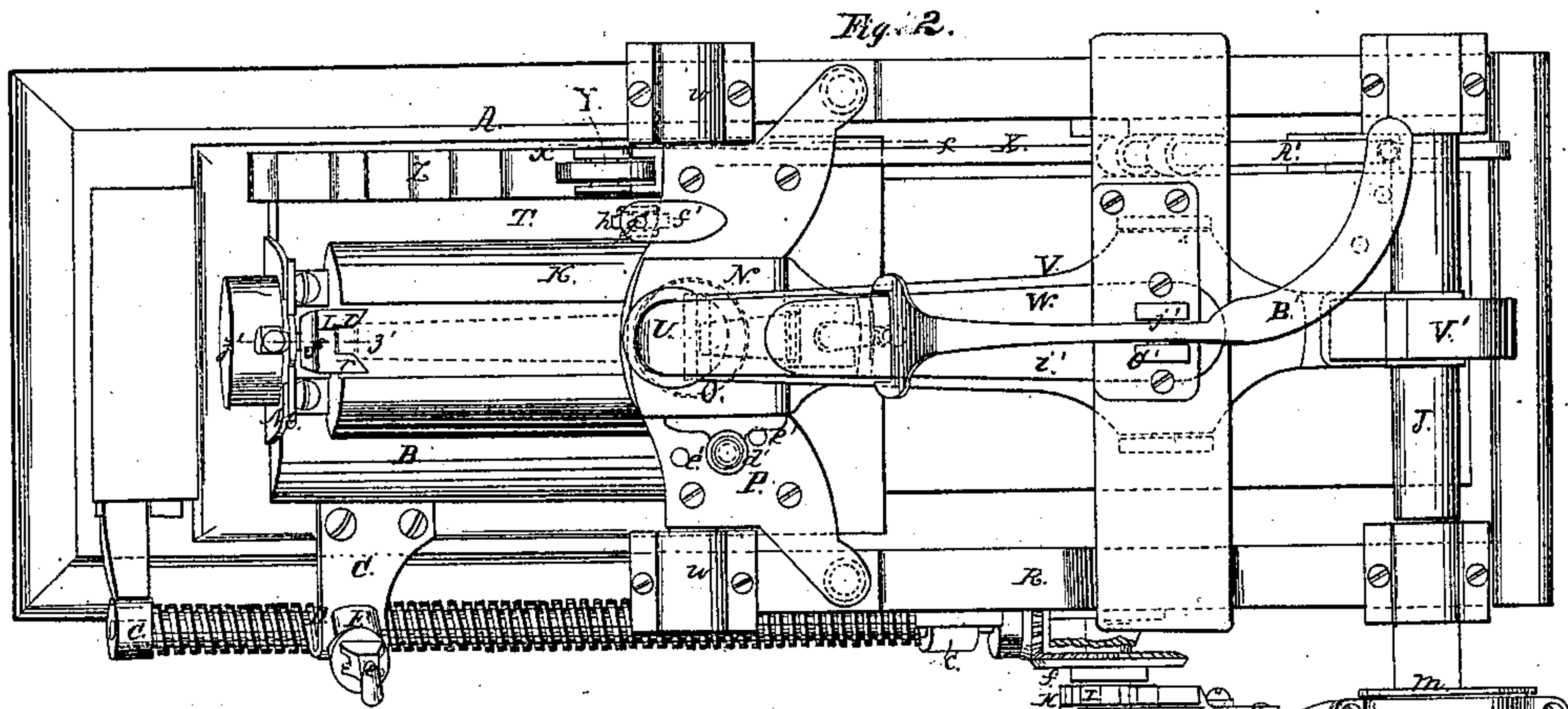
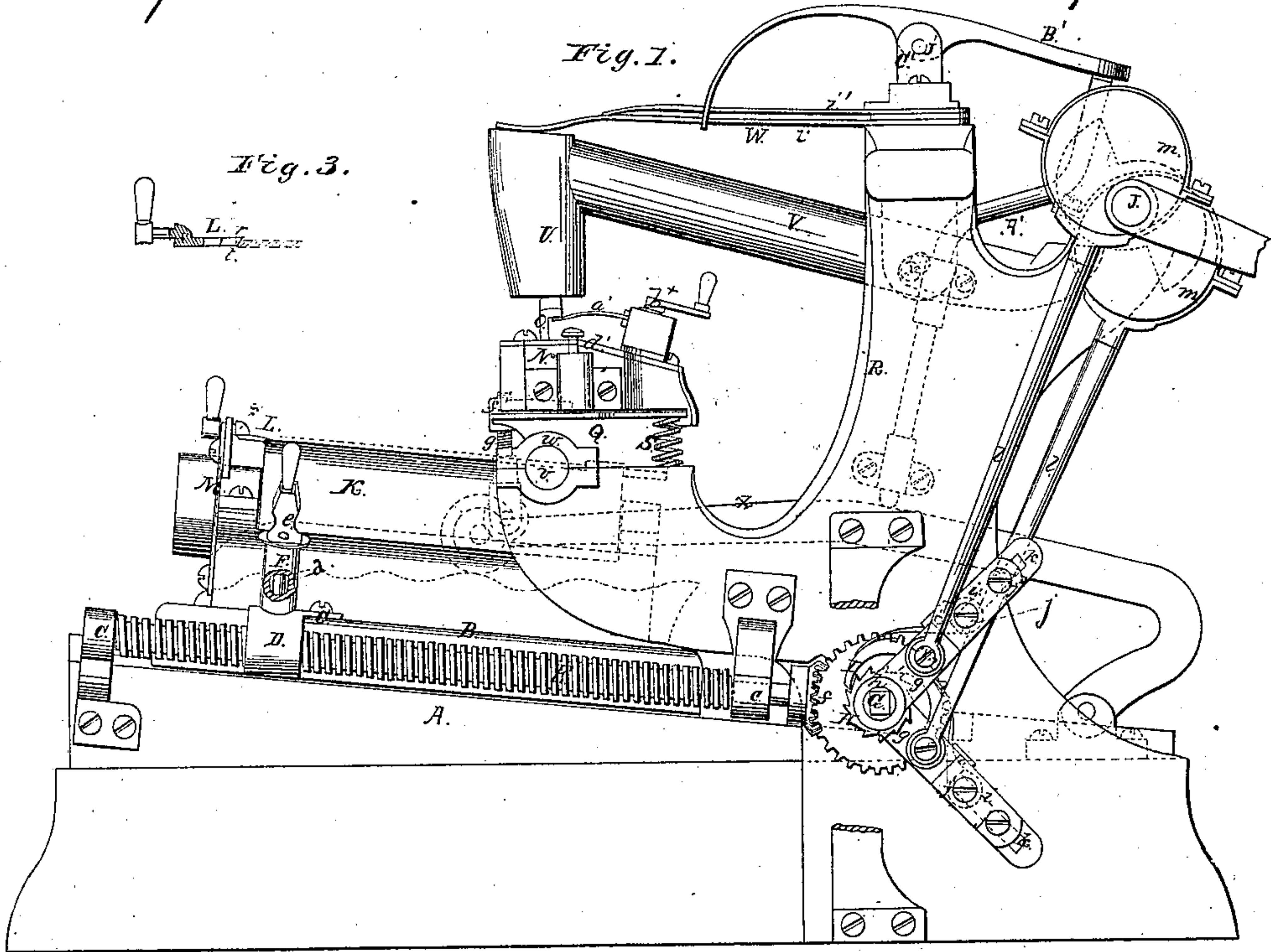


E. Bucklin, Jr,

File-Cutting Machine,

N<sup>o</sup> 52,926.

Patented Feb. 27, 1866.



Witnesses,  
J. M. Hampton  
J. M. Truitt

Inventor,  
E. Bucklin, Jr.  
Per M. M. H.  
Atty.

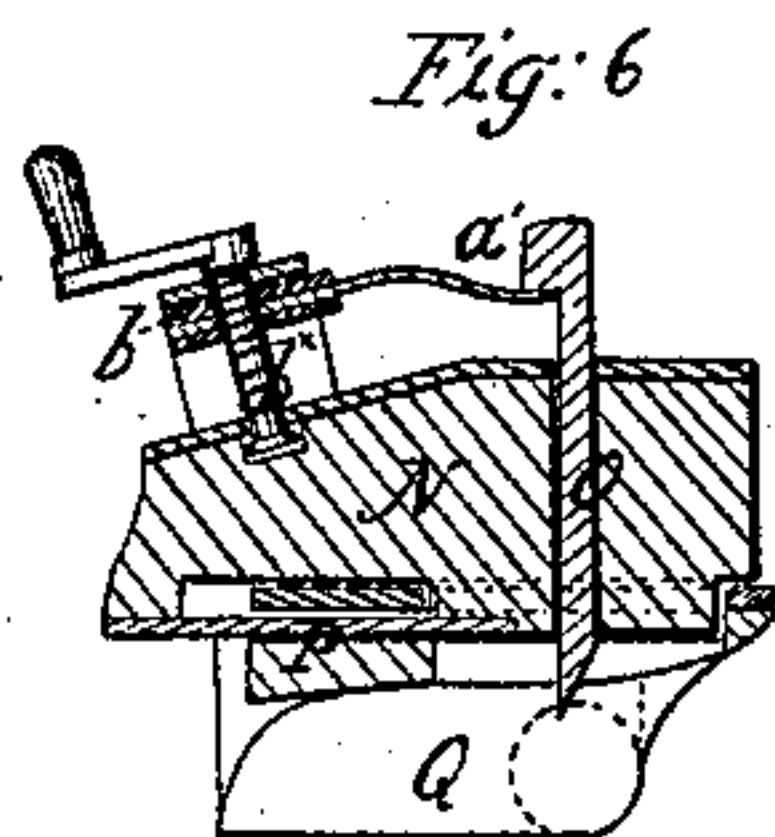
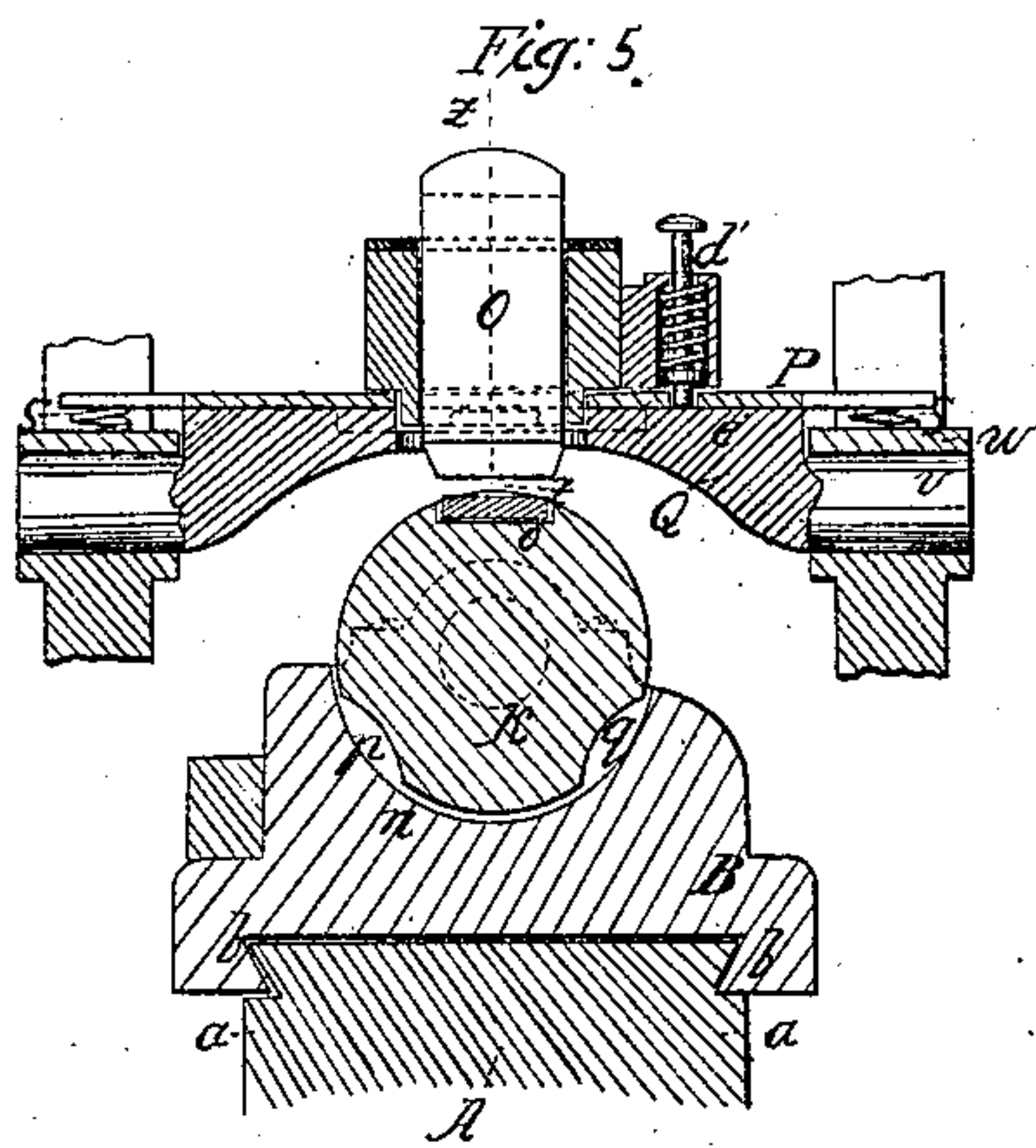
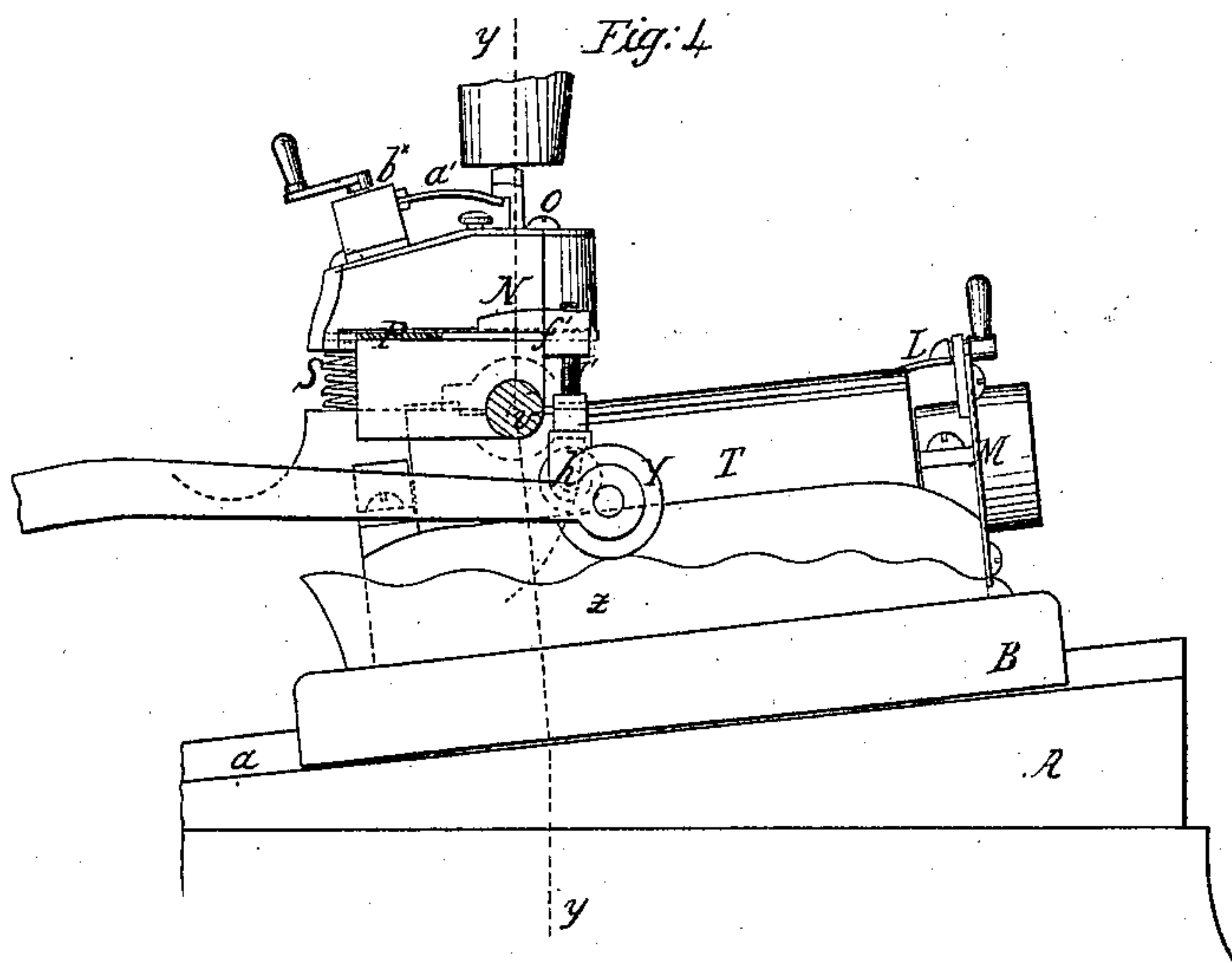
*E. Bucklin, Jr.*

*Sheet 2 of 2 Sheets*

*File-Cutting Machine,*

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*Patented Feb. 27, 1866.*



*Witnesses;*

*J. W. B. Compton*  
*Wm. Trewin*

*Inventor;*

*Edw. S. Bucklin Jr.*



# UNITED STATES PATENT OFFICE.

EDWARD BUCKLIN, JR., OF PAWTUCKET, ASSIGNOR TO HIMSELF AND  
LYSANDER FLAGG, JR., OF SMITHFIELD, RHODE ISLAND.

## IMPROVEMENT IN MACHINES FOR CUTTING FILES.

Specification forming part of Letters Patent No. 52,926, dated February 27, 1866.

*To all whom it may concern:*

Be it known that I, EDWARD BUCKLIN, JR., of Pawtucket, in the county of Providence and State of Rhode Island, have invented a new and Improved Machine for Cutting Files; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1, Sheet No. 1, is a side elevation of my invention; Fig. 2, a plan or top view of the same; Fig. 3, a detached side sectional view of a clamp pertaining to the same, taken in the line  $z' z'$ , Fig. 2; Fig. 4, Sheet No. 2, a vertical longitudinal section of a portion of the same, taken in the line  $x x$ , Fig. 2; Fig. 5, a transverse vertical section of the same, taken in the line  $y y$ , Fig. 4, and Fig. 6 a vertical section of a portion of the same, taken in the line  $z z$ , Fig. 5.

Similar letters of reference indicate corresponding parts.

This invention relates to a new and improved machine for cutting files; and it consists, first, in an improved feed mechanism for feeding the file to the cutter, whereby the speed of the file may be varied according to the size of tooth required.

The invention consists, second, in an improved file-bed so constructed and arranged that files of different shapes may be attached thereto.

The invention consists, third, in an improved means for adjusting the cutter to suit the shape or form of the file in its longitudinal profile.

The invention consists, fourth, in a means for graduating the strength of the spring according to the strength of blow required to be given the cutter.

The invention consists, fifth, in a novel and improved arrangement of the cutter-stock, whereby the cutter may with the greatest facility be adjusted to give the file-blank the different cuts required.

The invention consists, sixth, in an adjustable double spring, whereby the hammer may be operated upon with greater or less force, as circumstances may require.

The invention consists, seventh, in a means for holding or securing the file in its bed, whereby the file may be firmly held in position and very readily attached to and detached from the bed.

A represents the bed-piece of the machine, the upper surface of which is slightly inclined from a horizontal position, as shown in Figs. 1 and 3, and has a dovetail groove,  $a$ , made in each side near its upper surface, as shown in Fig. 4.

B is a slide or carriage, which is fitted on the bed-piece A and has a tongue,  $b$ , at each side, to fit into the grooves  $a a$ , the slide or carriage being held on the bed-piece, but allowed to work freely back and forth thereon.

The slide or carriage has an arm, C, extending horizontally from one side of it, and at the outer end of this arm there is an eye, D, through which a screw, E, passes, said screw having its bearings  $c$  at the side of the bed-piece. There is no screw-thread in the eye D for the screw E to work in; but said eye has a tube, F, at its upper part, in which a pin,  $d$ , is fitted, with a spiral spring upon it, and a cam-lever,  $e$ , attached to its upper end. By adjusting this lever  $e$  the pin  $d$  may be made to engage with the screw E or be detached from it. (See Fig. 1.) This pin  $d$  forms the only connection between the screw E and the slide or carriage B, and communicates motion to the latter from the former. The screw E is rotated by bevel-gears  $f$  from a shaft, G, which has two ratchets, H H, upon it, with which pawls I I engage, said pawls being pivoted to arms  $g$ , which project from collars  $h h$  placed loosely on the shaft G. Each arm  $g$  has an adjustable bar,  $i$ , attached to it by set-screws  $j$ , the latter passing through oblong slots  $k$  in the bars into the arms, and the bars  $i$  are connect by rods  $l l$  to eccentrics  $m m$  on the driving-shaft J of the machine, said eccentrics being placed in opposite positions on the shaft J. By this arrangement the pawls I I are made to act alternately on the ratchets H H, and the screw E turned and motion given to the slide or carriage B, the speed of the latter being varied by adjusting the bars  $i$  farther in or out on the pawl-arms  $g$ . The farther inward the bars  $i$  are adjusted on the arms  $g$  the quicker will be the feed-movement of the slide or carriage B, and the slower said move-



ment will be as the bars *i* are adjusted outward. This variation in the speed of the slide or carriage is necessary in order that the files may be cut with different-sized teeth, or coarser and finer files cut, as desired.

The slide or carriage B has a cavity, *n*, made longitudinally in its upper surface, and of semi-circular form in its transverse section, and in this cavity there is fitted a cylinder, K, which is the file-bed. (See Fig. 5.) This file-bed has a series of longitudinal grooves or recesses made in its periphery corresponding in form to that of the files to be cut, *o* representing a rectangular recess for a flat-file blank, *p* a half or quarter round recess for a half or quarter round file, and *q* a V-shaped recess for a triangular file. By this means the same file-bed K may be made to answer for the different kinds of files to be cut, the bed K being turned in the slide or carriage until the proper recess is uppermost.

The file-blanks are held in position by having the tang at one end inserted in an eye at the rear end of the recess in which the blank is fitted, a clamp, L, grasping the front end of the blank. This clamp is composed of two prongs, *r r*, projecting from an arm, *s*, the inner sides of the prongs from the points backward being beveled so as to catch over and bind on the outer end of the blank, and these prongs are not only beveled longitudinally, but also transversely, as shown at *t*, in order that the front end of the file-blank may be held down in the recess or prevented from rising. (See Fig. 3.) This clamp L is attached to a spring or elastic plate, M, which is secured to the front or outer end of the slide or carriage B, and said spring has a tendency to press the clamp over the outer end of the file-blank. By this simple device the blank may be very readily adjusted to and detached from the bed K, and when adjusted firmly held in position.

N represent a stock in which the cutter O is placed. This stock works on a pendent journal, *u*, as a center, said journal being fitted in a plate, P, attached to a bar, Q, the ends of which are provided with journals *v*, fitted in bearings *w* on a framing, R, attached to the bed-piece A.

The cutter O is fitted loosely in a slot in the stock N, and is retained or held up by a spring, *a'*, attached to a nut, *b'*, through which a vertical screw, *b<sup>x</sup>*, passes. By turning the screw *b<sup>x</sup>* the cutter may be adjusted higher or lower, as desired, and the shortness from wear compensated for, and by turning the stock N the cutter O may be placed so as to cut transversely across the file-blank at right angles, or in an oblique position relatively therewith either to the right or left. The cutter-stock is retained or held so that the cutter may operate upon the file-blank in these different positions by means of a pin, *d'*, fitting in holes *e'* in the plate P.

The rear part of the plate P rests upon spiral springs S S, the journals *v* being at the

front end, and to the front end of plate P' there is attached an arm, *f'*, in which a vertical bar, *g'*, is screwed, said bar having a roller, *h'*, in its lower end, which roller works on a pattern or shaper, T, at one side of the slide or carriage B. This pattern or shaper T, as the slide or carriage B is moved along, actuates the plate P and raises or lowers the cutter O, so that the cutter will penetrate the file-blank a uniform depth, the pattern or shaper T corresponding in form to the file-blank. (See Figs. 2 and 4.)

The cutter is struck by a hammer, U, the arm V of which works on pivots or a shaft, the hammer being raised by cams V' on the driving-shaft J and forced down by a spring, W, attached to the framing R. This spring W is composed of two parts, *i' i'*. In fact, there are two springs, one placed over the other, the upper one being adjustable, so that it may be turned over upon the lower one when a strong blow of the hammer is required. When a light blow is required the upper spring *i'* is turned off from the lower one. A further means for modifying the strength of this spring consists of a curved bar, X, one end of which is pivoted to the framing R, and the opposite end provided with a roller, Y, which rests upon a track, Z, attached to one side of the slide or carriage B, and having an irregular upper surface, as shown clearly in Fig. 4. Upon this bar X the lower end of a rod, A', rests, said rod being fitted in suitable guides attached to the framing R, and the upper end of said rod being underneath a lever, B', the fulcrum-pin *j'* of which is in a bearing, C', on the framing R. The upper part of the rod A' is bent in crank form, so that it may be turned to bear against the under side of the lever B', nearer to or farther from its center, as required. The front end of the lever B' bears upon the spring W each time a prominence on the track Z raises the roller Y, and with a greater or less pressure, according to the distance the upper end of the rod A' is adjusted from the fulcrum of the lever B'. This variable pressure of the spring W causes the file-blank to be cut at intervals with teeth rather greater in depth, so that more prominent burrs will be thrown up, rendering portions of the file more prominent than other parts. This I deem an advantage, as I consider the file is rendered more durable thereby, as all portions of its surface are not used at once, the prominent portions being first worn down, and then the less prominent portions used.

The track Z, it will be understood, is made to conform to the longitudinal profile of the file-blank, or it may be described as being thus made and the grooves or indentations then formed in it, the tops of the several prominences, as well as the centers of the concaves between, touching curved lines which correspond to the longitudinal profile of the file-blank.

This machine is extremely simple, and will operate well. It contains no parts which will



be liable to get out of repair, and the strength of the blow may be graduated as desired.

The cutter may be readily detached from the stock whenever required, and applied to it with the greatest facility.

The feed arrangement affords superior advantages for disconnecting the slide or carriage from the screw, so that the former may be shoved back at the termination of each cut of the blank, all that is required being simply to raise the pin *d* from the screw *E*, which may be done with the greatest facility through the medium of the cam-lever *e*.

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

1. The screw *E*, operated by the ratchets *H* and pawls *I*, in combination with the adjustable pin *d*, fitted in the eye *D*, attached to an arm, *O*, connected with the slide or carriage, all arranged substantially as and for the purpose set forth.

2. Connecting the eccentric-rods *ll* to the pawl-arms *g* through the medium of adjustable bars *i*, for the purpose of varying the speed of the feed, all constructed and arranged substantially as described.

3. The cylindrical file-bed *K*, provided with a series of longitudinal recesses to suit file-blanks of different forms, as set forth.

4. The clamp *L*, constructed and applied substantially as shown and described, for holding the file-blanks in or to the bed *K*.

5. The plate *P*, on which the cutter-stock *N*

is fitted, arranged with springs *S S* and journals *v*, in combination with the pattern or shaper *T* at the side of the slide or carriage, on which a roller, *h'*, at the lower end of a bar, *g*, attached to the plate *P*, rests, all arranged as shown, for the purpose of adjusting the cutter to suit the shape of the file-blank, substantially as set forth.

6. The cutter-stock *N*, fitted to the plate *P* so as to be capable of adjustment thereon, to place the cutter in a proper relative position with the file-blank to suit the different cuts required, all constructed and arranged substantially as described.

7. The duplex or double spring *W*, arranged with a movable upper part, *i'*, so that said upper part may be turned over the lower part or moved off from it, according to the strength of the blow required to be given the hammer.

8. The giving of stronger blows to the hammer intermittently by means of the track *Z*, having an irregular upper surface, the pivoted bar *X*, with roller *Y* attached, resting upon said track, the rod *A'* and lever *B'*, all arranged to operate substantially in the manner as and for the purpose set forth.

9. The cutter *O*, fitted in the stock *N* and retained by a spring, *a'*, adjustable substantially in the manner as and for the purpose specified.

EDWARD BUCKLIN, JR.

Witnesses:

WM. DEAN OVERELL,  
M. M. LIVINGSTON.