E. Bucklin Jr.

File-Cutting Machine,

No. 68,946. Patented Sep. 17, 1867.

Fig. 1.

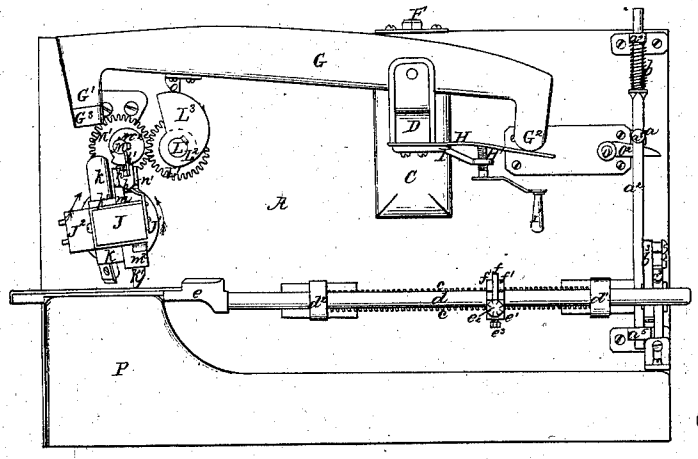


Fig. 2.

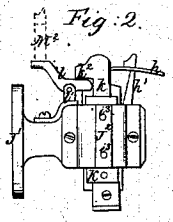


Fig. 3.

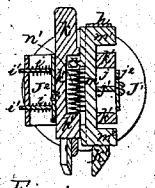


Fig. 4.

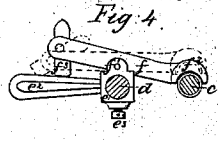


Fig. 5.

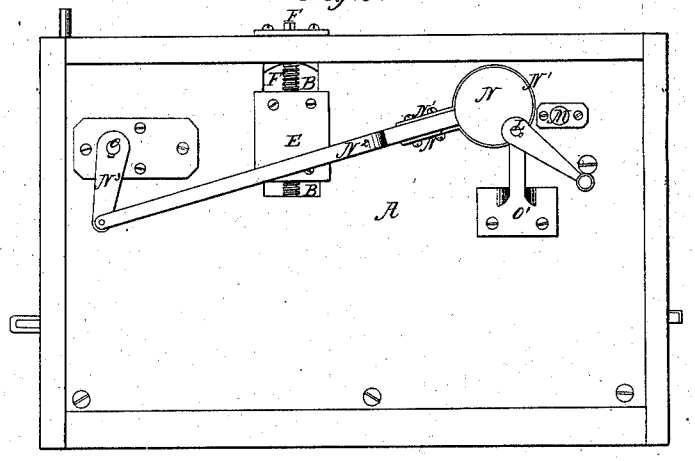
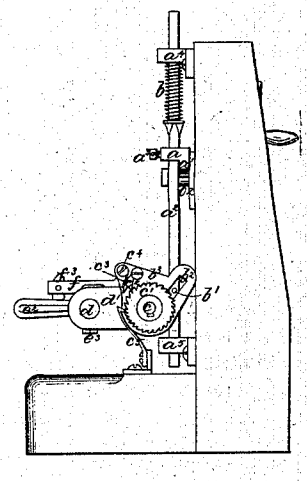


Fig. 6



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Letters Patent No. 68,946, *dated September* 17, 1867.

IMPROVED FILE-CUTTING MACHINE.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, EDWARD BUCKLIN, Jr., of North Providence, in the county of Providence, and State of Rhode Island, have invented new and useful improvements in File-Cutting Machines; and I do hereby declare the following to be a full and correct description of the same, sufficient to enable others skilled in the art to which my invention appertains to understand and construct the same, reference being had to the accompanying drawings, which make part of this application, and in which—

Figure 1, Plate I, is a front elevation of my improved machine.

Figures 2, 3, and 4, Plate I, are elevations and sectional views of detached parts of the same.

Figure 5, Plate 2, is a rear elevation, and

Figure 6, Plate 2, a side elevation of the same.

Similar letters of reference indicate corresponding parts in the several figures.

The nature of my invention consists in novel means of operating the hammer, of adjusting the chisel on the file-blank automatically, previous to the blow being struck, and of feeding the file-blank to the chisel, as hereinafter more fully described.

A, in the drawings, may represent the wall of a building, or a wall built on purpose for the machine, with an opening, B, into which fits a block, on which a plate, C, and bent arm D are formed. A plate, E, screwed to the back of the block, (see fig. 5,) forms a bearing for the same against the rear of the wall. A set-screw, F, serves to raise or lower the block and bent arm D to any desirable position. The bent arm D forms a bearing for the hammer G, which is pivoted in the same, and is provided with two bent ends G^1 and G^2. The end G^2 rests on a flat spring, H, consisting of as many separate leaves as may be deemed necessary or desirable, which are securely fastened to the under side of the horizontal part of the bent arm D, their free ends operating against G^2, and which receive more or less tension by means of a screw, H′, passing through a plate or arm, I, and operated by a handle, I′. The end G^1, of the hammer G, receives the steel cap G^3 which delivers the blow. J is a hollow block formed on a plate, J^1, and having instead of one side the bent metal J^2. The block J and plate J^1 can rotate in their bearing in the wall A, as shown by arrows, fig. 1. This block J forms the bearing for the chisel-stock K and the holder K′. The chisel-stock K is formed with a round top part, *k*, and the three-sided hollow part k^1. A shoulder, k^2, on the round top part *k*, rests on one arm of the lever *l*, pivoted in a bearing, *l′*, on the block J. The holder K′ consists of a straight piece, *m*, provided with two projections, m^1 and m^2; the former extends over and the latter under the side of the block J, (see fig. 3.) On the inner face of the holder K′ are two vertical grooves, in which the bevelled inner ends of the chisel-socket K slide. On this inner face of the holder is also a projection, *n*, against the under side of which, and the bottom of the hollow square part k^1 of the chisel-stock, a spiral spring, *n′*, has its bearings. In the side of the block J is a slot, *j*, through which a set-screw, j^1, passes, which is held by a plate, j^2, and is secured in the holder K′. The chisel-stock K is held against the holder K′ by means of spiral springs *i*, on the rods i^1, which are secured to the plate i^2, their free ends passing through holes i^3 in the cap J^2. The springs *i* press the plate i^2 against the square part k^1 of the chisel-stock K, but not with sufficient force to allow the latter to move vertically in the block J. A flat spring, *h*, secured to the block J, passes over the projection m^1, and is held in place by the hook-end of the lever h^1, pivoted to the side of the block J, and passing through a slot, h^2, in the spring *h*. L is the main shaft through which motion is communicated to the machine. On this shaft L is secured a toothed wheel, L^1, and a sleeve, L^2, provided with a cam, L^3. This cam engages a smaller cam, *o*, on the under side of the hammer G. The gear-wheel L^1 engages with a toothed wheel, M^1, on a shaft, M, on which is also secured a cam, M^2, which operates on the other arm of the lever *l*, already described. On the shaft L, in the rear of the wall A, is secured an eccentric, N, fig. 5, which moves in a band, N^1, the ends of which are fastened to the connecting-arm N^2, in the forked end of which is pivoted the lever N^3, which again is keyed to the short shaft O. O^1 represents a brace on the rear of the wall, forming a bearing for the shaft L. Keyed on the shaft O, at the front of the wall A, is a tappet, O^2, figs. 1 and 6, which operates a projection, a^1, on the slide *a*, which moves on the square rod a^2, and is secured to it by means of the set-screw a^3. The rod a^2 has two bearings, a^4 and a^5, near its upper and lower end. The upper end of the rod a^2 is round, and smaller in diameter than the lower square part of

the rod, thus forming a shoulder, which, with the bearing a^1, forms bearing for the spiral spring b, which has a tendency to depress the rod a^2. A pin, b^1, moves in an inclined slot, b^2, in the peculiarly-shaped plate b^3, which is loose on the shaft c, on which, outside of the plate b^3, is keyed a ratchet-wheel, c^1. This ratchet-wheel c^1 is operated by a pawl, c^2, pivoted to the plate b^3, and held against the teeth of the wheel c^1 by a spring, c^3, secured to the pin c^4. Two bosses, d^1 d^2, on the front of wall A, bearings for the shafts c and d, (see fig. 1.) The shaft c is provided with a screw-thread for the distance between the two bosses d^1 and d^2. The shaft d extends beyond the boss d^2, and carries at its end the file-bed e, which slides in a groove in the solid bed P, which may be made of iron, masonry, or any other suitable material. The shaft d passes through the square part e^1 of the handle e^2, which part, e^1, slides freely on the shaft, and can be secured at any point desired by means of the set-screw e^3, fig. 4. The part e^1 is provided with two lugs f^1, between which the arm f is pivoted. This arm f is provided at its inner end with a semicircular cap, f^2, the inner face of which is provided with a female screw-thread, corresponding with the male screw-thread on the shaft c, on which the cap f^2 can be made to rest. The outer end of the arm f is forked, and has pivoted between its forks the swinging-piece f^3, in such a manner that by placing the swinging-piece f^3 in a vertical position, as shown in black in fig. 4, the forked end of the arm f will be raised, and the cap f^2 depressed on to the shaft c, the handle e^2 forming a support or bearing for the swinging-piece f^3. But when the piece f^3 is swung from the vertical position, as shown in red lines fig. 4, the cap f^2 will be elevated from the shaft c.

Motion being imparted to the shaft L the cam L^3 is rotated with the sleeve L^2, and in rotating elevates the hammer G by means of the cam o. At the same time the cam M is rotated by means of the toothed wheels L^1 and M^1, and in rotating operates on one arm of the lever l, which causes the other arm to be raised, and with it the chisel-stock K by means of the shoulder k^2. By raising the chisel-socket the spring n' is compressed, as the holder K′ cannot be raised, it being held down by the flat spring h. The raising of the chisel-stock K containing the chisel allows the file-bed, which at the same is slightly moved forward, to pass along under the chisel—the file-blank being held in place by means of the holder K′—which only bears on the file-blank sufficiently to keep it in place and still allow it to slide under the holder. The cams are so arranged that when the cam M has released the lever l, and allowed the spring n' to force the chisel-holder downward, the feed-motion shall have been completed; but the cam L^3 shall still engage the small cam o until the chisel is firmly down on the file-blank in its place again, when the end G^1 of the hammer G being released from the cam L^3, will be suddenly forced down on the chisel-holder, by means of the action of the spring H upon the end G^2; or, in other words, the cams are so arranged that the blow on the chisel will not be struck simultaneously with the downward motion of the chisel-holder, but only when the chisel has descended to the place on the file-blank where the next cut is to be made; for if the blow were simultaneous with the descending of the chisel, the blow might cause the chisel to deviate from the proper cut it is to make. As the shaft L is rotated its motion is imparted to the eccentric N, which, by means of the arm N^2 and lever N^3, gives a reciprocating motion to the shaft O and tappet O^2. While the chisel-holder is being elevated the same movement elevates the tappet O^2, and it the rod a^2, which compresses the spring b, and causes the plate b^3 to rotate by means of the pin b^1 being forced upward in the inclined slot b^2. By the rotation of the plate b^3 the pawl c^2 forces the ratchet-wheel c^1, and with it the shaft c, to rotate, the retaining pawl c^5 slipping over the teeth of the ratchet-wheel c^1, the cap f^2 being held down firmly on the shaft c by means of the swinging-piece f^3. Being placed in position, as shown in black lines, fig. 4, the screw-thread on the shaft c forces the cap f^2, and with it the shaft d, (which is firmly held to the handle e^2, to which the arm f, with the cap f^2, is attached,) and file-bed e a corresponding distance forward, and this while the cam M elevates the chisel-holder by means of the lever l, and thus allows the file-bed to be moved forward under it. When the tappet O^2 moves downward, after reaching the highest point of its reciprocating movement, the spring b forces the rod a^2 downward, and the pin b^1 being forced downward, in the inclined slot b^2, causes the plate b^3 to rotate back to its original position, the retaining pawl c^5 catching in the teeth of the ratchet-wheel c^1, and the pawl c^2 sloping over its teeth. By means of setting the slide a, with its projection a^1, higher or lower (within a certain distance) on the square rod a^2, revolution of the ratchet-wheel c^1 and shaft c, and consequently the distance advanced by the file-bed and shaft d, and the distance between the cuts on the file, are regulated. The force of the blow of the hammer is regulated by means of the spring H, to which more or less tension can be given by means of the screw H′, operated by the handle I′. The blow can be further regulated by raising or lowering the block on which the bent arm D is formed, by means of the set-screw F.

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

1. The combination of the bent arm D, hammer G, and set-screw F, arranged substantially as described.

2. The combination of the bent hammer G, provided with downwardly bent arms G^1 G^2, spring H, bent arm I, set-screw H′, having a handle, I′, with the bent arm D secured on the adjustable plate C, substantially as described.

3. The adjustable hollow block J, provided with a metal cap, J^2, on one side, forming the bearing for the chisel-stock K and holder K′, substantially as described.

4. The chisel-stock K, with a round top part, k, a shoulder k^2, and hollow three-sided part k^1, in combination with the holding device K′, substantially as described.

5. The combination of devices, substantially as herein described, by which the chisel is elevated and brought down upon the file-blank, previous to the descent of the hammer upon the end of the chisel-stock.

6. The device for elevating and releasing the chisel and for holding the blank upon its bed, consisting of the toothed wheels L^1 M^1, cam M^2, lever l, shoulder k^2, on the chisel-stock K, and springs n and h, and holder K′, substantially as described.

7. The device for operating the feed-screw, consisting of the tappet O^2, adjustable slide a, projection a^1, on the square rod a^2, pin b^1, inclined slot b^2, in the loose plate b^3, pawls c^2 and c^3, and ratchet-wheel c^1, secured to the shaft c, substantially as described.

8. The device for moving the file-bed, consisting of the handle e^2, on shaft d, provided with square part e^1, set-screw e^3, lugs f^1, pivoted arm f, one end of which is provided with a cap, f^2, having a female screw-thread on its inner face, the other end being forked and holding the pivoted swinging-piece f^3, substantially as described.

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Witnesses:

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