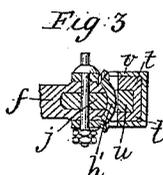
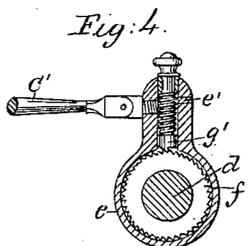
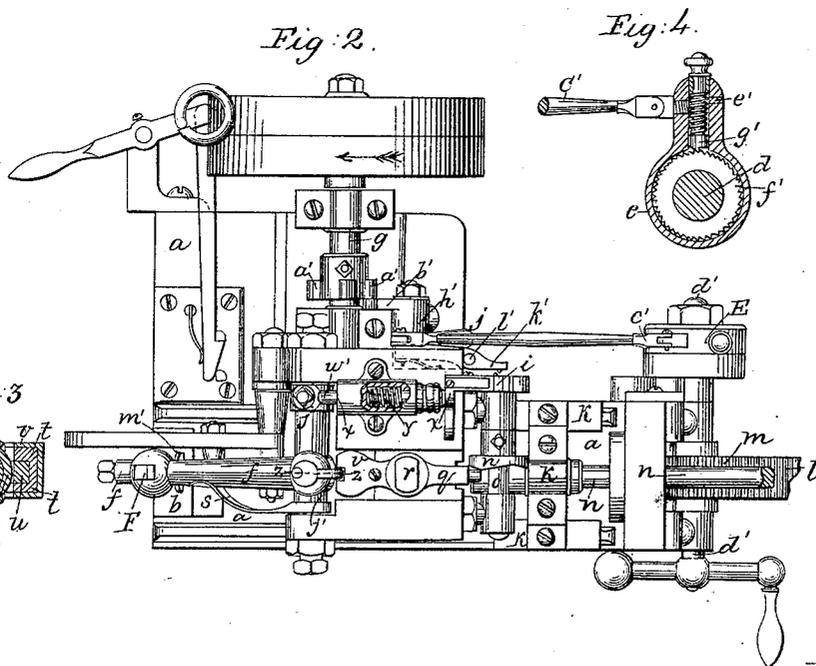
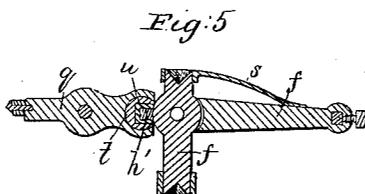
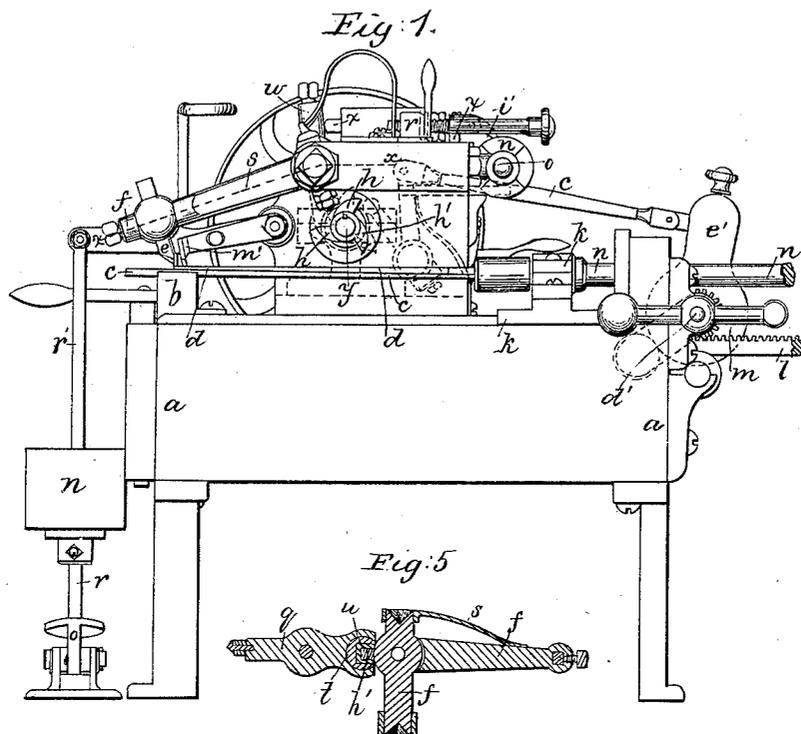


A. WEED.

Machine for Cutting Rasps.

No. 57,230.

Patented Aug. 14, 1866.



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IMPROVED MACHINE FOR CUTTING RASPS.

Specification forming part of Letters Patent No. 57,230, dated August 14, 1866.

To all whom it may concern:

Be it known that I, ALFRED WEED, of Boston, in the county of Suffolk and State of Massachusetts, have invented Improvements in File and Rasp Cutting Machines; and I do hereby declare that the following, taken in connection with the drawings which accompany and form part of this specification, is a description of my invention sufficient to enable those skilled in the art to practice it.

This invention relates to certain changes and modifications in the details of file or rasp cutting machines of general organization like those shown in the United States Patent granted for my inventions March 14, 1865, and March 17, 1866.

The description of my present invention will therefore be confined, nearly as possible, to the construction, organization, and operation of those parts in which my present invention is found.

In general terms, my present invention may be said to consist, first, in the means by which a pointed cutter or a series of pointed cutters are given sidewise movement over the face of the blank to be cut; and, second, in the means by which an intermittent forward-feed movement of the blank is effected.

Figure 1 of the drawings shows, in side elevation, a file or rasp cutting machine of a now well-known type in all of its main features, and having incorporated therein the details in which my invention consists. Fig. 2 shows the said machine in plan with the striking-spring *i* removed to exhibit the parts immediately beneath.

This machine is one in which the blank with its soft-metal shield is fed over a short bed. The blank is firmly held to the bed by the action of a weighted presser bearing on the blank in close proximity to the place where the blow is struck, this being given by a tool held in the free or vibrating end of a radius arm or bar. Vibrations of this arm are given by the conjoined action of cams or wipers on a rotating shaft and a counteracting-spring.

Among these and other well-known features, *a* is the main frame of the machine; *b*, the short bed over which the soft-metal shield *c* and the blank *d* are fed. *e* is the tool; *f*, the tool-arm or radius-bar. *g* is the rotating

shaft; *h*, the cams or wipers thereon, which, with the counteracting-spring *i*, give motion to the arm *f*, which is mounted on the rocker-shaft *j*.

The carriage *k* is moved on ways on the frame *a* by the rack *l* and pinion *m*, the carriage having a mandrel, *n*, which can be turned, and which is provided with a socket and set-screw for holding the blank and its shield by the tang end of each.

I will now refer to and describe parts in which my present invention is found and others intimately connected therewith, observing that the spring *i* and the means for graduating its tension, and shown in Fig. 1, are removed in Fig. 2 to exhibit parts beneath, and which contain matters of novelty.

The arm *f* is pivoted to the rock-shaft *j*, so that it can be vibrated laterally as well as vertically. Lateral vibration is imparted to arm *f* by means of a cam, *n*, on shaft *o*, which has at one end a ratchet, *p*, from which shaft *o* receives rotary motion.

Lever *q*, pivoted at *r* to the upper part of the frame, has one end slotted and arranged to embrace, as in jaws, a projection from arm *f*, so that it will be seen that, when shaft *o* is made to rotate, the cam *n*, in conjunction with the counteracting-spring *s*, will cause side vibrations of *f*, so that if the cam *n* is properly devised and operated the cutting-tool, when made as a rasp-pick, will pass over the face of the blank from side to side during a succession of vertical vibrations of *f*.

The manner of connecting the arm *f* and the lever *q*, which gives to said arm its lateral motion, is shown in detail in Figs. 3 and 5, the former being a vertical section taken on the line *z z* of Fig. 2, and Fig. 5 being a longitudinal horizontal section taken on the line *x x* of Fig. 1. The lever *q* is pivoted at *r* and in its front end a vertical circular cavity is formed, in which is placed a movable bearing or box, *t*, as shown in Fig. 5. In the center of the front of this box *t* a hole is bored, in which is inserted a circular plug, *u*, as shown in Figs. 3 and 5. A vertical slot is then cut in the front face of both *u* and *t*, as shown in Fig. 3, in which the projection *h'*, secured to the rear end of arm *f*, engages.

It will be seen that, while *t* turns in a horizontal plane to accommodate itself to the lat-

eral movements of the lever *q* and arm *f*, the bearing or box *w* also turns in a vertical plane, the two thus forming a kind of universal joint which readily adapts itself to the movements of *f* and *q* and permits the arm *f* to vibrate freely without binding in its connection with the end of lever *q*.

On the rock-shaft *j* is a projection, *w*, which, in the turning of the rock-shaft, strikes against the slide *x* and moves it, compressing the spring *y*, which afterward returns the slide *x* to its former position. This slide carries a pawl, *i'*, which operates the ratchet *p* to cause the shaft *o* to turn. The extent of movement of the slide *x*, by which the pawl takes one or more teeth of the ratchet, as may be desired, is regulated by the position of the check-nuts on the spindle of slide *x*.

It will now be seen that at each blow of the rasp-pick *e* its position will be changed either to the right or left of the position it had when giving the preceding blow, and also that each row of teeth will be cut on arcs of circles described with the distance from the point of the pick to the center of rock-shaft *j* for radii.

I will now proceed to describe the means by which the blank is fed forward intermittently after each row of teeth is completed, so as to properly space the distances between the rows along the length of the rasp.

On the shaft *g* is fitted cams *a'*, which work a rock-shaft with two arms, *b'*, one of which reciprocates the link *c'*, which vibrates a pawl-carrier, *e'*, on the shaft *d'*, on which is fixed the feed-pinion *m*. On the end of said shaft *d'* is fixed the ratchet *f'*, worked by the pawl *g'*. In Fig. 4 is seen, in sectional elevation, this ratchet-and-pawl arrangement.

This mechanism, as described, would feed the blank forward with each stroke of the pick, the cams *h* and *a'* corresponding in numbers of wipers or throws; but a mechanism is introduced which withholds the rocker-arm *b'* from being forced by the action of its spring *j'* into a position where cam *a'* can act upon it until such time as the pick has made the last indent of a row of teeth at either side of the blank.

There is a detainer which operates on the double rocker-arm *b'*. This detainer I will now describe. It consists of a latch-lever, *k'*, pivoted at *l'*, and kept by a spring (seen in dotted lines, Fig. 2) in such position as to latch against and hold one of the two rocker-arms *b* in the position in which it is placed by action of cam *a'*, so that the other rocker *b'* cannot return under action of the spring *j'*, to be again operated on by cam *a'*, till the first shall have been relieved from the detention of the latch *k'*.

To release the rocker-arm *b'* at such times as a forward feed is required for the blank *d*, pins are placed in the side of ratchet *p*, so that at suitable intervals in the rotation of the ratchet *p* one of said pins will abut against a projection on one end of lever *k'*, and will cause sufficient movement thereof on

the pivot *l* to release *b'* from the catch on the other end of *k'*. The spring *j'* then throws the rocker *b'* into position where the cam *a'* will act upon it, and the feed of the blank will then be effected, by means of the mechanism before described, in an obvious manner.

For various widths of blanks the lateral vibration of the tool *e* can be changed by substituting for the cam *n* others of different throws.

The times of the feed-movement of the blank are determined by the number and position of the pins in the side of the ratchet *p*, which pins can be changed as may be needful for the work to be performed. The extent of the feed-movement of the blank is determined by the check-nuts on the spindle of the pawl-slide *x*, so that the pawl *i'* can take one or more teeth of the ratchet *p*, as may be needed.

Though but one pick is shown in the drawings, it is evident that a series of pick-tools *e* may be secured to the arm *f*, the series being sufficient to extend across the entire width of the blank and to make one row of teeth with each downward vibration of the arm *f*. In this case the feed of the blank should take place after each of such blows, as may be accomplished in a manner before alluded to. But even in using a series of picks to make a row of teeth quite across the blank at each blow it will be well to give sufficient lateral vibration to the arm *f* to cause the teeth of each row to be made in line with the spaces between the teeth of each preceding row. This is easily accomplished by the mechanism shown in the drawings, calling only for a few obvious modification, such as changing the cam *n* for one having the very slight throw needed, and arranged to throw the cutters at each stroke alternately from right to left, and vice versa, the latch *k'* being dispensed with.

Instead of pivoting the arm *f* to the rock-shaft *j*, these parts may be made integral with each other, and then both together could be moved the slight distance sidewise that is needed to interspace the succeeding rows of teeth, the rocker-shaft *j* being mounted in long bearings instead of on centers, as shown in the in such bearings by the action of cam *n*.

As the presser *m'* has to be raised from the blank after cutting a face thereof, and as it is borne down upon the blank by heavy weights *n'*, it is very desirable to be able to relieve the blank from pressure without employment of the hands of the operative. I therefore combine the presser-weight with a treadle-lever, *o'*, by a continuation of the rod *p'*, on which the weights *n'* are hung, so that while the operator easily lifts the presser with his foot his hands are free to run the carriage *k* back to its starting-place.

I claim—

1. Producing the teeth of rasps in arcs of parallel circles by giving to the tool and the rasp-blank movements substantially as described.

2. The means for giving lateral vibration to

the cutter, consisting of the lever *f*, when pivoted to its rocker-shaft *j*, the lever *q*, and the cam *n* and spring *s*, combined to operate substantially as described.

3. The compound compensating-jaw in lever *q*, formed by the two cylinders *t* and *u*, slotted and arranged substantially as specified.

4. The means for intermittently feeding the blanks, consisting of cam *a'*, rocker *b'*, the spurs on ratchet *p*, and latch *k'*, arranged to operate

the ratchet *f'*, and thereby to move the blank-carriage *k*.

5. The combination, with the presser-holder, of the rod *p'*, weight *n'*, or its equivalent spring, and treadle *o'*, arranged and operating together as described.

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Witnesses:

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