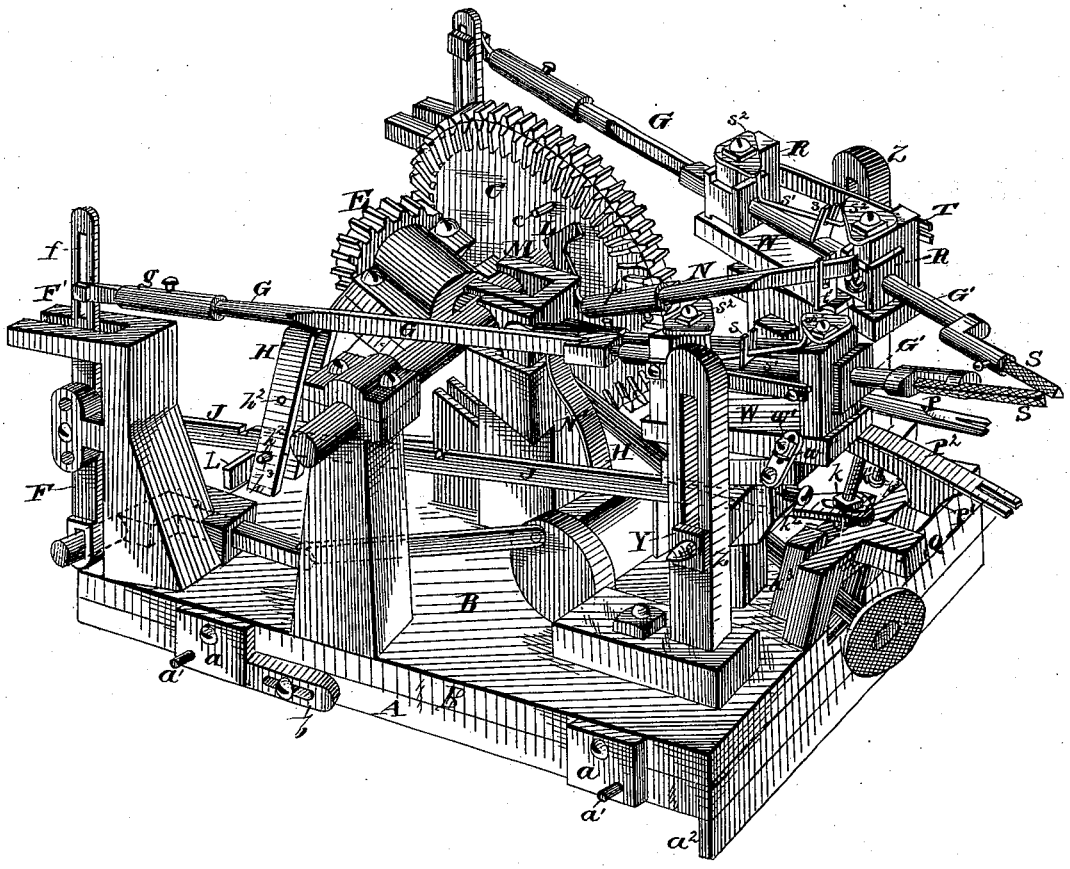
2 Sheets—Sheet 1.

A. S. EASTHAM.
Gin-Saw Filing-Machine.

No. 207,957. **Patented Sept. 10, 1878.**

Fig. 1.



WITNESSES
Ed. J. Nottingham
A. W. Bright

INVENTOR
A. S. Eastham.
By H. A. Seymour.
ATTORNEY

2 Sheets—Sheet 2.

A. S. EASTHAM.

Gin-Saw Filing-Machine.

No. 207,957. Patented Sept. 10, 1878.

Fig. 2.

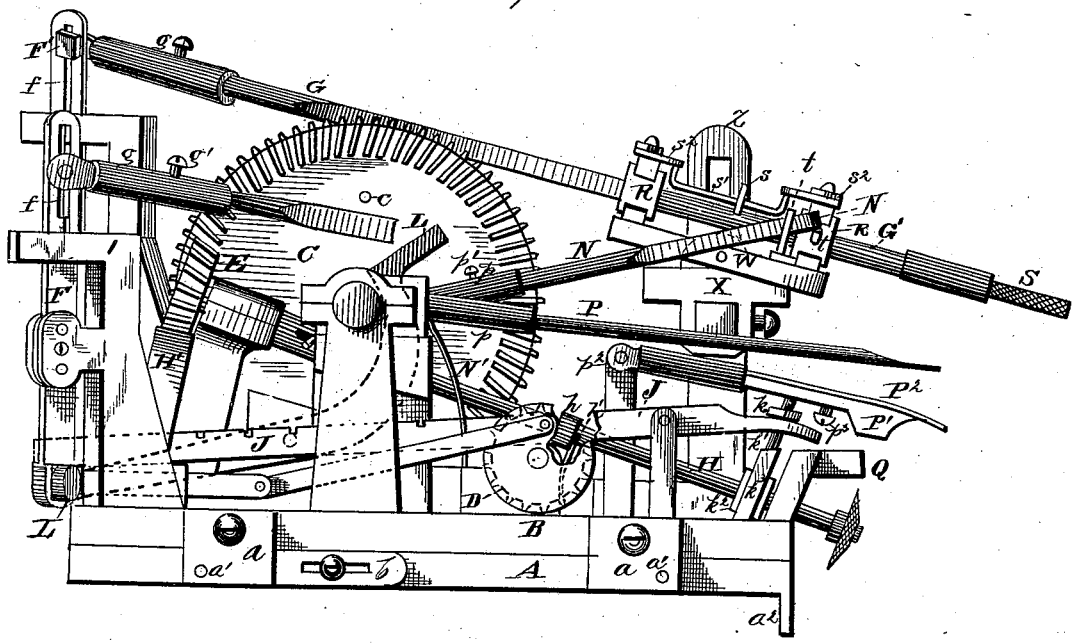


Fig. 4.

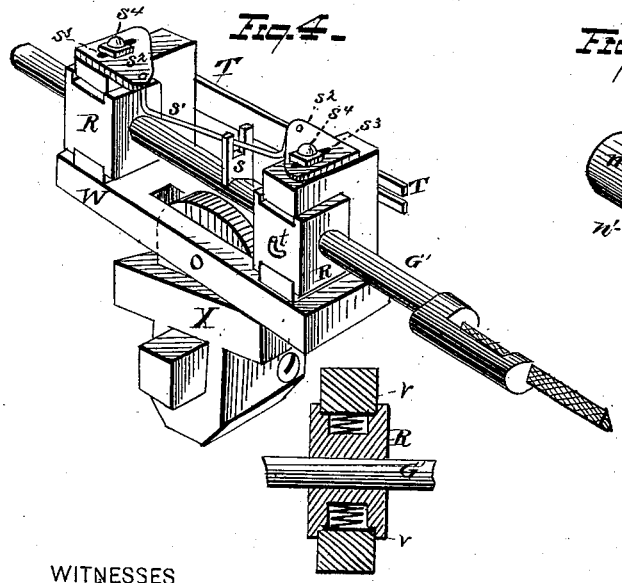
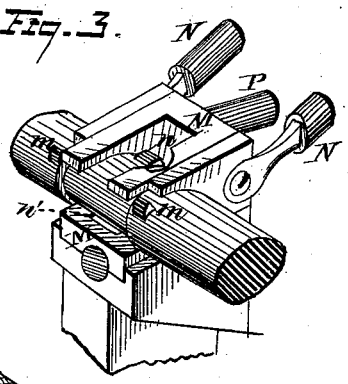


Fig. 3.



WITNESSES

Ed. S. Nottingham

A. W. Bright

INVENTOR

A. S. Eastham

By H. A. Seymour

ATTORNEY

UNITED STATES PATENT OFFICE.

ALBERT S. EASTHAM, OF NAVASOTA, TEXAS.

IMPROVEMENT IN GIN-SAW-FILING MACHINES.

Specification forming part of Letters Patent No. **207,957**, dated September 10, 1878; application filed February 6, 1878.

To all whom it may concern:

Be it known that I, ALBERT STANDFIELD EASTHAM, of Navasota, in the county of Grimes and State of Texas, have invented certain new and useful Improvements in Gin-Saw-Filing 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 pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

In this machine the intermittent operation of the saw-feeding device presents the different teeth one by one to the action of a continuously-rotating circular file, which latter is withdrawn from contact with the saw previously to such feeding operation. This circular file is adapted to be set so as to bring all the saws into the same plane of the series of teeth to which the file is set; or, if this is not desired, the mechanism for accomplishing such result need not be used.

In addition to the action of the circular file a set of three-cornered files are used, which are reciprocated in suitable frame-work of the upper part of the machine, and which are also adapted to be intermittently withdrawn from their work upon the saw, in order to allow the latter to be fed forward to present the next succeeding tooth to the action of the three-cornered files, and also to present a different tooth to the action of the circular file, as before alluded to. The office of these reciprocating three-cornered files is to round and bring to a point the corners of the teeth on both sides of the saw after the action of the circular file on the latter.

This being, briefly, the statement of the operation of the machine, the invention therein will be set forth in the following description and claims, the same being an improvement upon Letters Patent No. 193,492 of the United States, and which were granted me on the 24th day of July, 1877.

In the drawings, Figure 1 is a view, in perspective, of the machine. Fig. 2 is a side elevation of the same, with a portion of its parts removed. Fig. 3 is a detached view of the eccentric-head, which carries the saw-feeding device and certain other parts, together with the main actuating-shaft. Fig. 4 is a detail view, in part section and part side elevation, of the supporting and adjusting device of the reciprocating files.

The plank A supports the bed-plate B of the machine, and the guides *a*, secured upon both sides of the same, provide a way upon which the machine can be moved horizontally to and from the saw, while the stop *b*, by the adjustment of its set-screw within the elongated slot thereof, determines the limit of such horizontal movement of the machine toward the saw-cylinder. The pins a^1 being withdrawn from the guides, the bed-plate B is moved back, carrying the machine right-angularly away from the gin-saw. These pieces embrace suitable way-pieces, which are parallel with the saw-cylinder. The part a^2 is then slipped on those ways, and is held in position by a set-screw, which presses against the ways.

The plank, formed with its front downwardly-projecting cross-piece a^2, is moved parallel with the axial length of the saw-cylinder till the machine is in line with the annular set of teeth to be filed. The bed-plate is then moved forward over the way-plank, and secured in proper filing position.

The different operative parts of the machine are secured upon the bed-plate, and are adapted to perform their work as follows: The main driving-wheel C has spur-gearing, which drives the pinion D, and also bevel-gearing, which drives the pinion E. The pinion D, by intermediate connections, operates the rear upright levers, F, which latter are provided at their upper extremities with elongated slots *f*, in which the clamping-bolts F' of the tubular links *g*, which connect with the respective reciprocating file-rod connections G, have vertical adjustment. The rotating file-shaft H is driven by the said bevel-pinion and the connection shown, and is provided with collar *h*, against which the sheet-metal spring h^1 bears.

The object of this spring is to balance the shaft and yield readily to any pressure of the teeth against the file, that it may adapt itself to the irregularities of the teeth by means of the slotted sleeve at the upper end of the shaft. This file is raised so as to be brought into operative contact with the saw by means of the

weighted lever J, whose forward extremity engages with the nut k upon the tapped pin or stud k^1, which latter is secured to the box k^2. This bar has free sliding movement within the vertical guides k^3, and carries the forward extremity of the rotary file-shaft. The rear body of lever J works in an upright guide, H′, which is provided with a transverse hole, k^2, in which a pin, k^3, may engage, so as to allow the said lever to rest thereon; then, by the adjustment of the screw-nut k on the screw-pin k^1, which is secured to the sliding box k^2, the circular file may be set to any circle of the saws on the saw-cylinder, and the file will continue to cut till the rear end of the lever rests upon the pin in the guide. This causes all the saws to be brought to the same circle to which the file is set, as desired. When this is not desired the pin is removed from the guide and the weight on the file-shaft is moved or adjusted so as to cause the file to cut the desired depth or length of the tooth.

A pin or lug, c, upon the side of the main driving-wheel operates the rocking lever L, so that the revolution of said wheel will cause the rocking lever to engage with the weighted lever, to cause the circular file to drop from contact with the gin-saw at a time prior to the movement of the feeding mechanism which rotates the saw.

The head-block M partially embraces the main driving-shaft, and carries the three shafts respectively of the two lever-wedges N and the feeding device P. These shafts are provided with the tubular connecting-links p and set-screws p^1, which allow the feed-hand and the lever-wedges to be longitudinally adjusted within said tubular links. This head-block is adapted to be operated by cams m, formed respectively on the two sides of the same. The return of the head against the shaft, after its proper operation by said cams, is caused by the recoil-spring N′; but, in order to guard against any accident or failure of this spring to return the head-block by reason of jamming of the parts, a cam or stud, n, is formed upon the shaft, and is adapted to engage with the rear wall of the slots n'. This latter slot is made in the lower body portion of the eccentric-head, and thus a positive force may be brought to bear upon the head in returning it rearward against the driving-shaft.

The drag or check pawl P^1 is loosely pivoted to a suitable support, p^2, and is provided with a spring, P^2, which may be maintained at any longitudinal angular inclination to the pawl by means of the set-screws p^3. This pawl may engage with any of the several teeth below the feed-hand, as may be suitable, and is designed to prevent the saw from being fed or rotated forward more than one tooth at a time under any circumstances. This drag or pawl is not raised or lowered, but keeps its position as the saw is set. It rests against the periphery of the teeth, embracing several, and drags against the teeth as the saw is moved.

The outwardly-projecting arm Q bears against the side of the saw, so as to receive the strain or force imposed upon the latter by the operation of the rotary file, and thus maintains the saw in true and constant position. The file-rod connections G are adapted to be longitudinally adjusted by means of the tubular connecting-links g and set-screws g'. The boxes R, through which the rods G′ pass, are provided with the upper and lower spiral springs, r, which provide a vertical cushioned bearing for said boxes, so that the three-cornered reciprocating files S may adjust themselves to the irregularities of the different teeth.

It is evident that, in substitution for these spirals, elliptic springs, secured in proper position, will accomplish the same purpose.

The file-rods are provided with guides s, in which the guide-rods s^1 work. These latter rods are connected at both extremities with the adjusting-plate s^2, which, by means of slots s^3 and clamps s^4, adjust the files to the feed as desired.

The forward boxes, in which the file-rods work, are pressed laterally outward by springs T, while the tendency of the latter is counteracted at a point of time in the operation of the machine just prior to the action of the saw-feeding device by means of the lever-wedges N. These latter have beveled ends, which wedge against the inner side of the engaging devices t, which latter are secured to said file-boxes, while they are supported just in rear of the same by the guide-supports t'.

The pressure of the springs T, which serve to press the three-cornered files to the saws, is increased or diminished by the tap on the end of the pins respectively tapped into the two front file-rod boxes, and which engage with said springs.

If desired, the rotary file apparatus may be dispensed with, so as to cause the saw-cylinder to be acted upon only by the three-cornered files. The construction and adaptation of parts are such, as described, relative to the operation of the saw-feeding device, that the latter is caused to act upon the saw subsequent to the action of said wedges, which laterally withdraw the file-boxes. The centrally-pivoted frames W, which support the file-boxes, are adapted to be maintained at any desired plane of vertical inclination by the upright slotted plates w and clamps w', while the lower supporting-blocks, X, are vertically adjustable in a straight line by the clamping-bolts y, which work within the slotted standards Y Z.

The reciprocating files are, by means of all the foregoing described apparatus, adapted to work in a higher or lower plane, to be presented to the saw at any angular inclination, either and both horizontal and vertical, and to adjust themselves to any irregularity of the different saw-teeth.

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

1. The combination, with the bed-plate pro-

vided with side guards, of the way-plank formed with the front downwardly-projecting cross-piece, said way-plank being provided with the stop-piece, which is adapted to adjustably determine the forward movement of the bed-plate thereon, substantially as set forth.

2. The combination, with the lever-wedges which act to laterally withdraw the forward file-rod boxes, of the eccentric-head, which is intermittently actuated in a forward and return movement by cams formed on the main driving-shaft, substantially as set forth.

3. The combination, with the file-rod boxes, urged laterally outward by suitable spring-pressure, of the lever-wedges, formed with oblique or beveled ends, and the intermittent-acting eccentric-head which actuates said lever-wedges, substantially as set forth.

4. The combination, with the cam-shaft and eccentric-head, of the saw-feeding device and the lever-wedges, the same being adapted so that the latter shall operate to laterally withdraw the reciprocating files from the saw prior to the forward movement of the saw-feeding device, substantially as set forth.

5. The combination, with the lever-wedges and the saw-feeding device, of the intermediate connections with the actuating eccentric-head, said connections being adapted to admit of longitudinal adjustment of the lever-wedges and saw-feeder, substantially as set forth.

6. The combination, with the lower supporting-block, of the centrally-pivoted frame which supports the file-rod boxes, said frame provided with a through vertical slot in its main longitudinal body, in which the segmental pivotal formation of said block works, said supporting-block and pivoted frame being provided with the adjusting-plates and clamping mechanism on both sides of their pivotal connection, substantially as set forth.

7. The combination, with the main driving-shaft having cams formed thereon, of the head-block, which partially embraces the shaft and carries the two lever-wedges, which latter operate to move the file-rod boxes inward, said head-block being intermittently actuated forward by the engagement of the shaft-cams with counter-cams formed on its sides, substantially as set forth.

8. The combination, with the front file-rod boxes, of the lever-wedges, which engage therewith and operate to throw the said boxes inwardly, substantially as set forth.

9. The combination, with the front file-rod boxes, which are urged outwardly by spring mechanism, of the lever-wedges, which are adapted to intermittently engage with and force the spring-pressed boxes inwardly, substantially as set forth.

10. The combination, with the intermittently-reciprocating lever-wedges, of the guides secured to the frames of the file-rod boxes and suitable mechanism for engagement with said boxes, substantially as set forth.

11. The combination, with the intermittently-reciprocating lever-wedges and the bifurcated guides in which the same work, of the engaging devices secured to the respective inner sides of the front file-rod boxes, substantially as set forth.

12. The combination, with the saw-feeding hand and lever-wedges, of the head-block which carries the same, and is adapted by suitable means to be intermittently reciprocated forward and back, substantially as set forth.

13. The combination, with the head-block which carries the saw-feeding hand and lever-wedges, of the shaft adapted by cam-engagement therewith to actuate the same forward and a spring which returns the head-block to its former position, substantially as set forth.

14. The combination, with the head-block, which partially embraces the cam-driving shaft and carries both the saw-feeding hand and lever-wedges, of the spring-bar, which has free bearing against its front side, and is adapted to return the said block to its former position upon release from the forward cam action, substantially as set forth.

15. The combination, with the head-block, which has sliding bearing upon a suitable support, and carries both the saw-feeding hand and lever-wedges, of the driving-shaft, provided with forwardly-actuating cams, which latter engage with counter cams formed on said head-block, and the spring return-bar, substantially as set forth.

16. The combination, with the recessed head-block, which carries the saw-feeding hand and is formed with a vertical slot in its lower longitudinal central body, of the shaft formed with a cam adapted to engage with the rear wall of said slot in case the spring return-bar fails to operate the head-block in its intermittent rear reciprocating movement, substantially as set forth.

17. The combination, with the head-block, which carries the saw-feeding hand and lever-wedges, and is made as described, of the driving-shaft formed with both the forward-actuating cams and the rear return-cam, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 16th day of January, 1878.

ALBERT STANDFIELD EASTHAM.

Witnesses:
WM. W. MANNING,
RUFUS HARDY.