A. S. EASTHAM.

GIN-SAW FILING-MACHINE.

No. 193,492. Patented July 24, 1877.

Fig: 1.

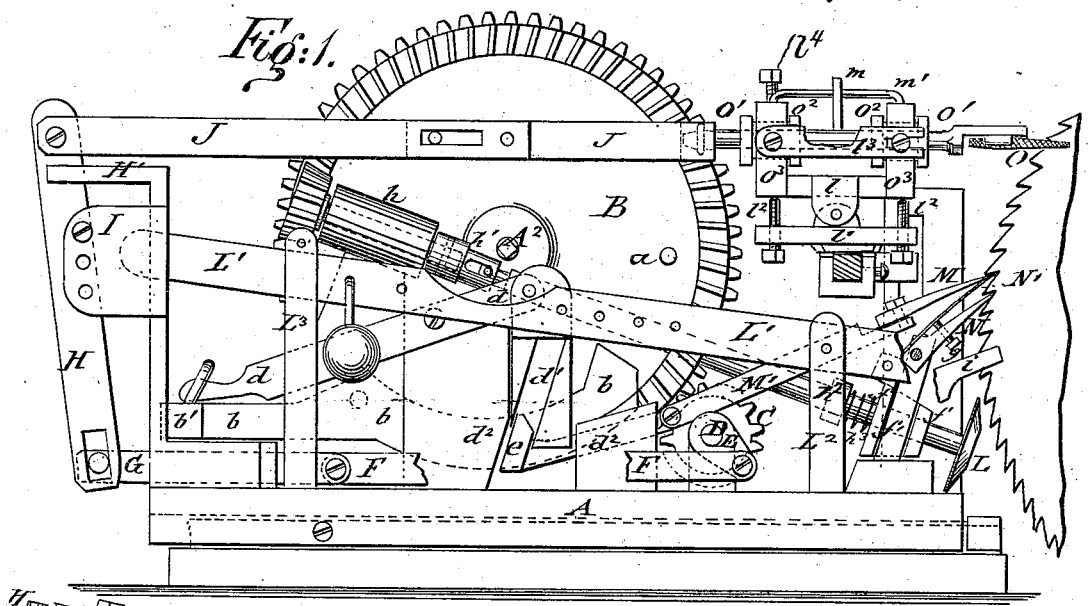


Fig: 2.

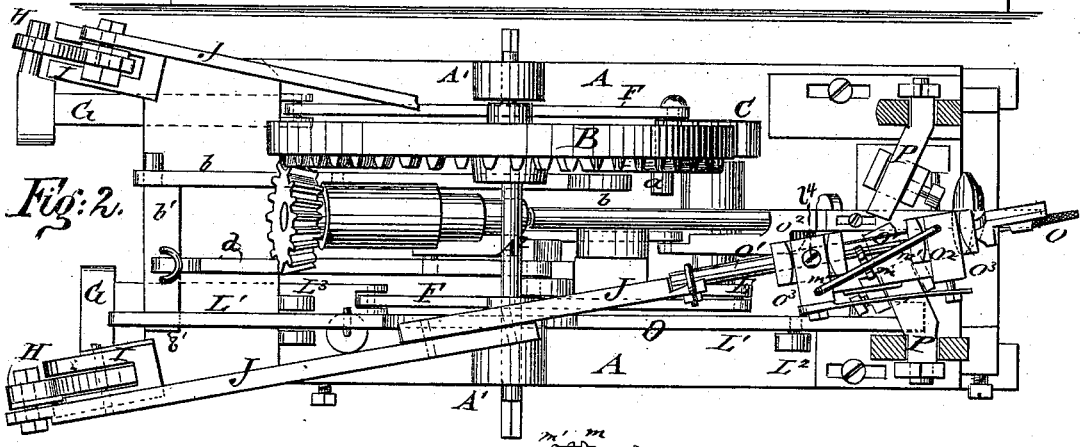
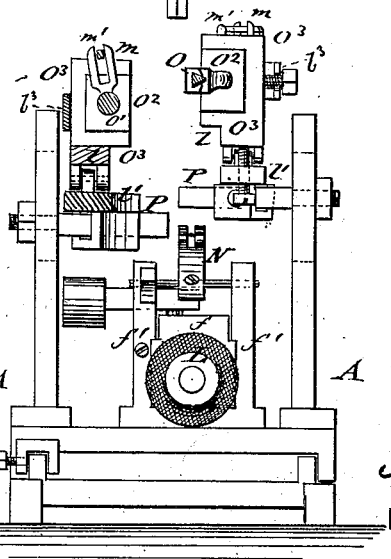


Fig: 3.



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ALBERT S. EASTHAM, OF NAVASOTA, TEXAS.

IMPROVEMENT IN GIN-SAW-FILING MACHINES.

Specification forming part of Letters Patent No. **193,492**, dated July 24, 1877; application filed May 12, 1877.

To all whom it may concern:

Be it known that I, ALBERT S. EASTHAM, of Navasota, in the county of Grimes and State of Texas, have invented a new and Improved Gin-Saw-Filing Machine, of which the following is a specification:

In the accompanying drawings, Figure 1 represents a side elevation of my improved gin-saw-filing machine; Fig. 2, a plan view, and Fig. 3 an end view, of the same.

Similar letters of reference indicate corresponding parts.

The invention relates to improvements in machines for filing the saws of cotton-gins in a reliable, rapid, and uniform manner; and the invention consists of a revolving circular file, that is withdrawn by suitable mechanism to admit the intermittent feeding of the gin-saw one tooth, which is accomplished by a feed-hand and drag or check pawl. The edges of the saw-teeth are sharpened by means of reciprocating files at both sides of the saw.

In the drawing, A represents the supporting-frame of my improved gin-saw-filing machine, which slides on a suitable stand, and is adjusted toward the gin-saw cylinder.

The frame A supports in upright standards A^1 the main shafts A^2, to which a large driving-wheel, B, is keyed, the power being imparted to the shaft either by belt or crank on the end of the shaft.

The driving-wheel B is provided with a spur-gear, for the purpose of intermeshing with a pinion, C, that transmits the power, by its shaft D, crank E, and crank-rods F G, to a lever, H, and reciprocating file-rods J, and by a bevel-pinion to the shaft of the circular file L, for importing rotary motion to the same.

The rotary file L is thrown out of the teeth of the saw when the saw-feeding device moves the saw, being again raised to filing position in the next notch. This motion of the circular file L is accomplished by a pin, *a*, on arm of driving-wheel B, said pin engaging a rocking lever, *b*, so as to press it down. The opposite end *b'* of the fulcrumed lever *b* is extended sidewise at right angles, the file-lever L^1 resting thereon.

The file-lever L^1 is fulcrumed to a support, L^2, near its front end, and connected with the shaft of the rotary file L, so as to lower it when the rear end of file-lever L^1 is raised, and drawing thereby the file out from between the teeth of the saw.

The feeding device M is operated by the same lever, *b*, the rear arm *b'* being connected to a fulcrumed lever, *d*, which operates an inclined and slotted plunger, d^1. The plunger d^1 is moved in and kept parallel to its guides d^2, engaging by its slotted part the head *e* of the feed-rod, and pushing the same forward with the descent of the plunger, simultaneously with the lowering of the rotary file, and drawing the same back when the saw is raised again.

The front plunger-guide d^2 forms also the guide-box for the feeding-rod M', which is provided with a pivot-joint in front of the box, the feed-hand M being attached to the end of the jointed rod M' by slot and set-screw, or hollow tube and set-screw. The feed-hand M is adjusted to proper position on the saw by the slot and set-screw.

The file-lever L^1 is weighted in suitable manner, as shown in Fig. 1, so as to carry the rotary file back into filing position as soon as the lever L^1 is released by the rear arm of the rock-lever.

The rotary file L is pressed against the saw with equal force, whether the same is in or out of circle, by the weight of the file-lever, which weight is moved back or forward thereon to obtain the desired pressure of the file on the saw.

The shaft of the rotary file L is supported in a reciprocating box, *f*, which slides on a guide-post, *f'*, of the bed-plate of frame A.

The file-lever L^1 is attached to this sliding box by a connecting screw and nut, by which the other end of lever L^1 is adjusted to the desired position with the rocking lever *b*, when the file L is adjusted to the teeth of the saw.

All the saws on the cylinder can be brought to the same diameter and in circle by placing the circular file L to the saw most out of circle, and to that part of the saw nearest to

the center of oscillation, and passing a pin through the rear end of file-lever L^1 and the rear guide-post L^3 of the same.

A drag or check pawl, N, rests on the third tooth below the feed-hand M, being pivoted to the guide-post f', or other suitable support, and provided with a light spring, N′, at the upper side of the drag N.

The spring N′ is raised at the front end by means of a set-screw, g, and is slotted, as well as the drag and feed-hand, the spring extending beyond the end of the drag, but its slot extending back, so as to be even with that in the drag. The slotted feed-hand rests on the raised spring when all the parts are in working position, and is adjusted by the set-screw of the spring N′, so that the edge of the feed-hand will just pass below the point of the tooth above, the spring being pressed down as the feed-hand passes to the root of the tooth, the spring being of sufficient lightness to be bent by the feed-hand without moving the saw or bending the upper teeth.

The drag or check pawl prevents the feed-hand from moving two or more teeth where they are broken or uneven. The feed-hand moves, then, the saw for one tooth, the drag drops to the next tooth, the feed-hand is drawn back by the plunger, and falls on spring N′, being then in position to move the saw again.

The rotary file is dropped from the teeth, and raised again simultaneously with the dropping and forward motion of the feed-hand, so as to work in conjunction with the feed.

The file-shaft turns in a long journal-box, h, supported in inclined position on a standard of frame A, being made of two parts, connected by a sleeve, h^1, which is slipped on the shaft and bearing against the journal-box. The sleeve is riveted to the upper part of the shaft, and extended over the other part of the shaft, and coupled thereto by a kind of slotted joint.

The file-shaft has at the lower end, back of its guide-box, a collar, h^2, against which presses a spiral spring, h^3, placed between collar and box f, the spring balancing the weight of the shaft, and holding circular file and coupling in position when the file is dropped from the teeth. The thin edge of the file enters the proper notch, whether the teeth are irregular or not, as neither the spring nor weight of the shaft offers resistance, securing the passing in of the file to the root of the tooth by the weight of the lever L^1.

The rotary file L is made of flat conical form, sharpening the teeth without bending them. The saw is steadied while the file is cutting by a fixed arm, i, which bears against the saw to be filed. The ways on which the filing-machine rests hold the same in its right-angular position with the saw. These ways may rest on pieces, which are fastened to the gin-stand in suitable manner to admit the adjustment of the filing-machine to the saws of the cylinder, which is also supported in suitable manner, so that the saws may be worked upon by the machine.

The shorter or cutting edges of the teeth are sharpened at both sides by three-cornered files O, that are reciprocated by the driving-wheel, crank-rod, and pitman-connection before described.

The fulcrum I and slotted lever H admit the adjustment of the crank-rods and file-rods to different lengths of stroke, the lever being also guided at its upper end by a recessed arm, H′.

The front ends of file-rods J are connected to piston-rods O^1 by a swivel-joint, and the rods guided in boxes O^2, that are adjustable in guide-supports O^3, which are supported on vertically-adjustable arms P of frame A. The guide-supports O^3 are connected by a base-piece, l, which is pivoted to a rest-piece, l^1, having end set-screws l^2, that adjust the guide-supports O^3 to any suitable angle, as required by the size and position of the saw.

The boxes O^2 are laterally adjusted in dovetail guides of the supports O^3, and secured rigidly thereto by set-screws l^4. The supports O^3 are connected by a steadying side strip, l^3. A fork-shaped guide, m, of the piston-rods O^1 moves along a diagonally-inclined or spiral rod, m', so as to impart a simultaneous turning motion to the reciprocating files. The three-cornered files O are set into sockets, and secured by clamp-screws to the ends of the piston-rods, the files being readily adjustable, as to position, stroke, and sweep, by the adjustable lever-boxes and guide devices, so as to be exactly adjusted to the teeth of the gin-saws, and sharpen the same at both sides in connection with the operation of the rotary file and feed devices.

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

1. A gin-saw-filing machine consisting, essentially, of a rotary and intermittingly movable file, of an intermittingly-operating feed and check device, and of adjustable reciprocating sharpening-files, substantially in the manner set forth.

2. The combination of the main driving-wheel B, having pin a, with a rock-lever, b b', and, by connecting-levers, with the feed device and rotary file, to raise or lower the latter simultaneously with the former, substantially as set forth.

3. The combination of main driving-wheel B, having pin a, rock-lever b b', connecting-lever d, and slotted and guided plunger d^2, with head e of feed-rod M′, to withdraw the same for dropping on next tooth, substantially as described.

4. The combination of main driving-wheel B, having pin a, rock-lever b b', weighted file-lever L^1, sliding box f, and rotary file-shaft, to drop or raise the file into teeth, as set forth.

5. The combination of feed-hand M with drag or check pawl N, having adjustable drop-spring N′, for the purpose described.

6. The combination of the coupling and slotted universal joint of rotary file-shaft with collar, balancing spiral spring, and slide-box of the same, to facilitate raising and lowering of rotary file, as described.

7. The combination of the reciprocating piston-rods of the files O with laterally-adjustable boxes, pivoted guide-supports, laterally-sliding rest-piece, and horizontal supporting-arms, to adjust files to any position toward teeth, as set forth.

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