(No Model.) 2 Sheets—Sheet 1.

J. A. ROGERS & D. C. BURNS.

GIN SAW SHARPENING MACHINE.

No. 525,515. Patented Sept. 4, 1894.

FIG. 1.

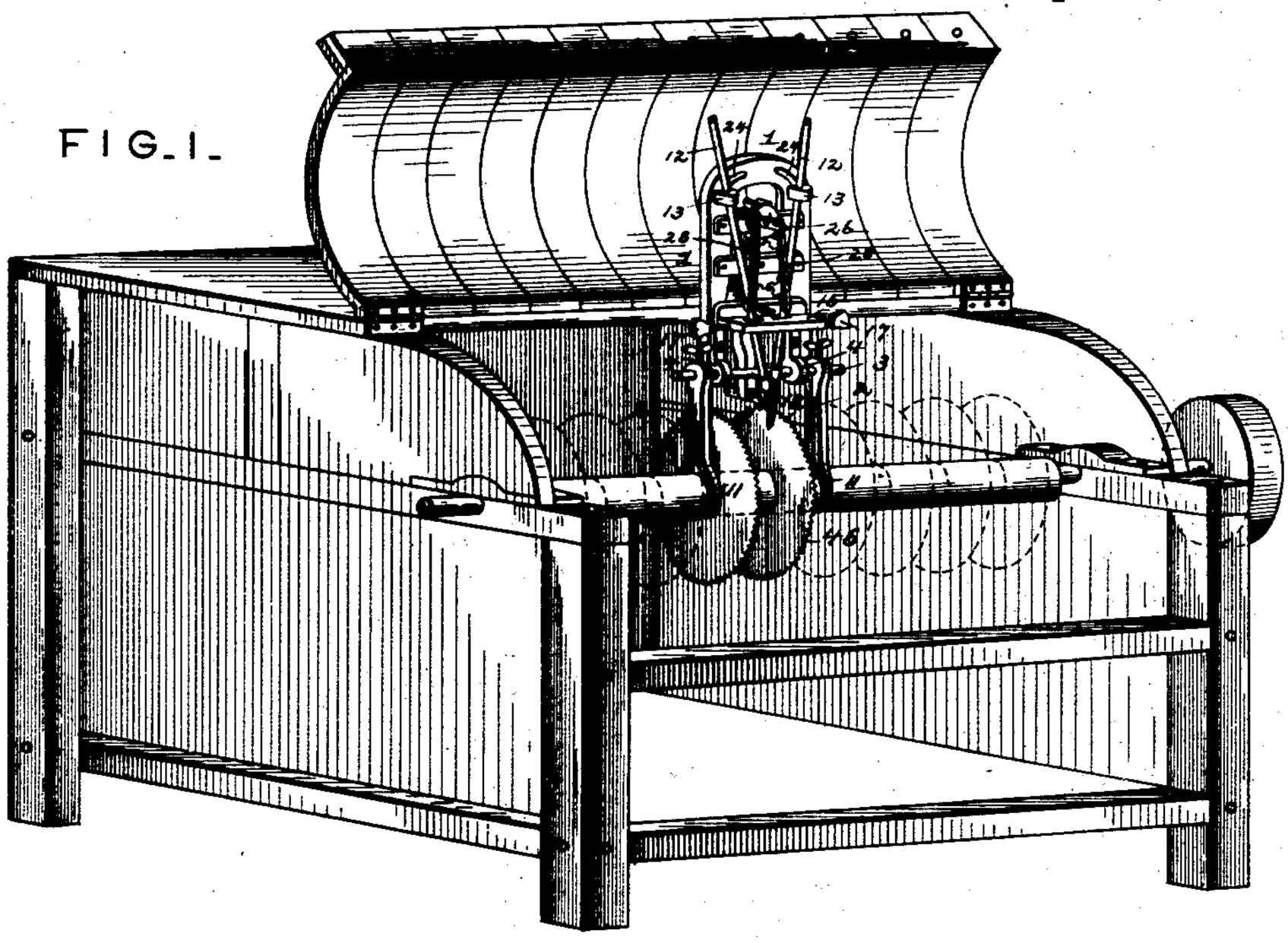


FIG. 4.

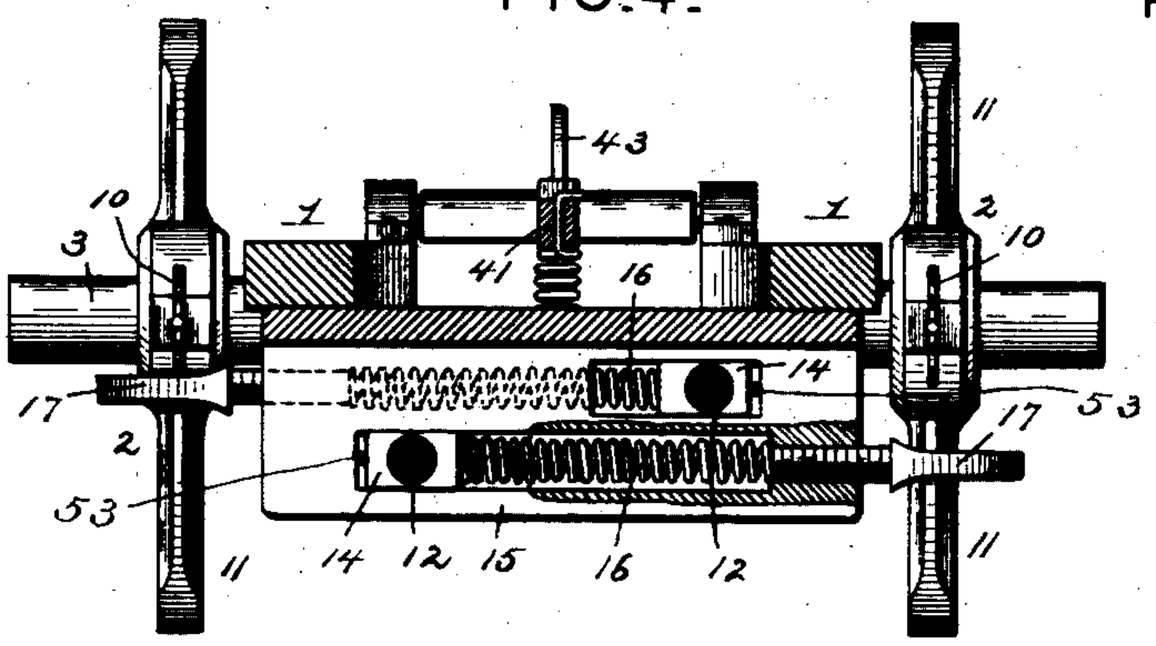


FIG. 5.

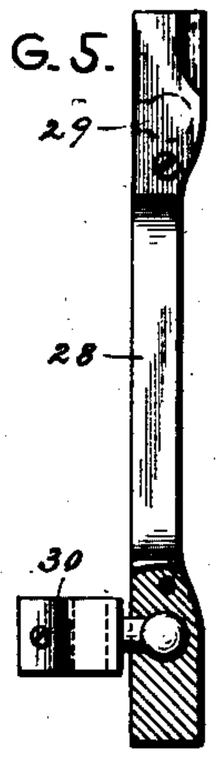
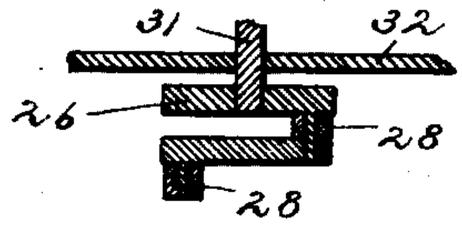


FIG. 7.

FIG. 8.



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By their Attorneys.

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GIN SAW SHARPENING MACHINE.

No. 525,515. Patented Sept. 4, 1894.

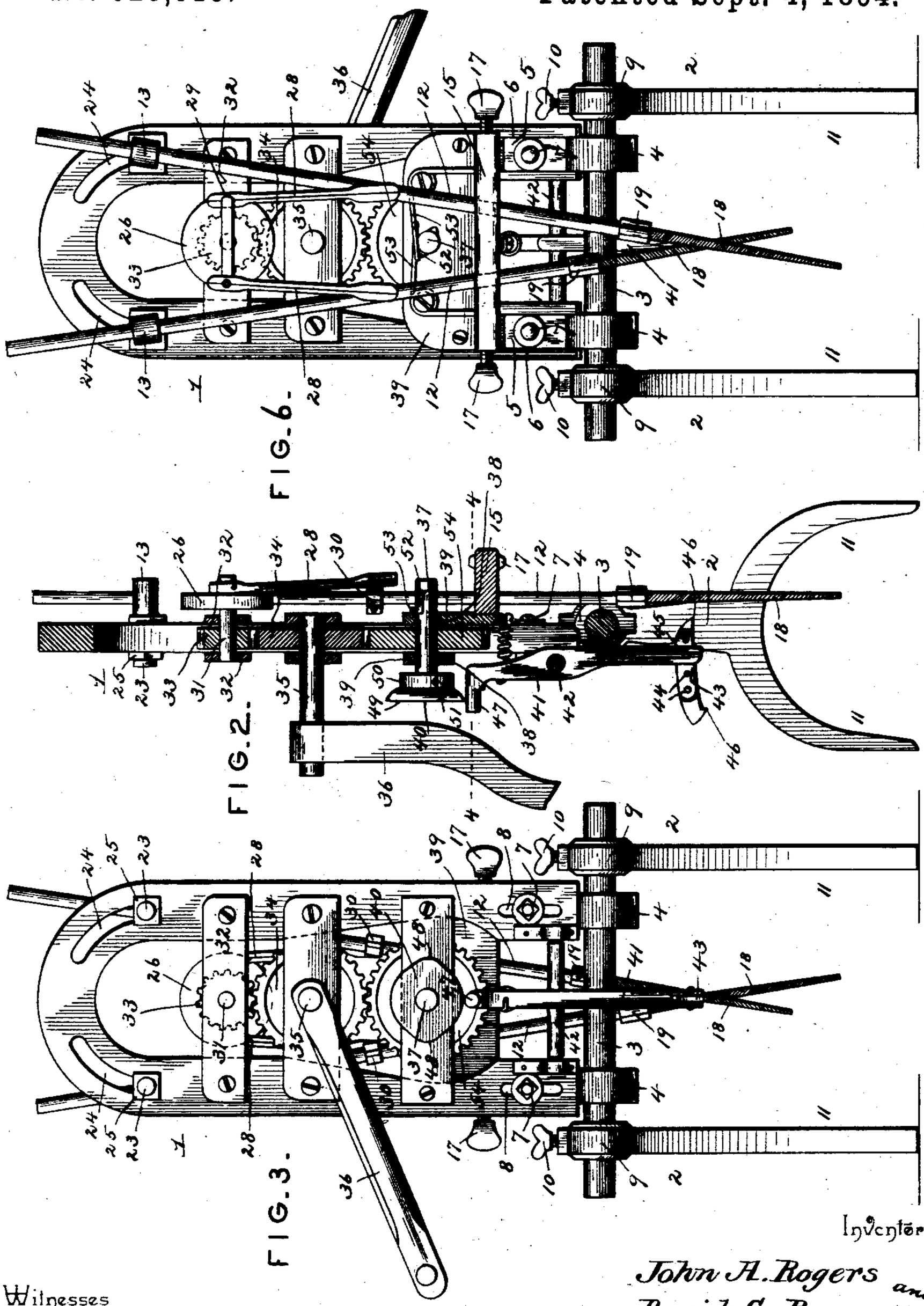

FIG. 6.

FIG. 2.

FIG. 3.

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By their Attorneys.

C. A. Snow & Co.

UNITED STATES PATENT OFFICE.

JOHN A. ROGERS AND DAVID C. BURNS, OF HARTSELL'S, ALABAMA.

GIN-SAW-SHARPENING MACHINE.

SPECIFICATION forming part of Letters Patent No. 525,515, dated September 4, 1894.

Application filed February 27, 1894. Serial No. 501,693. (No model.)

To all whom it may concern:

Be it known that we, JOHN A. ROGERS and DAVID C. BURNS, citizens of the United States, residing at Hartsell's, in the county of Morgan and State of Alabama, have invented a new and useful Cotton-Gin-Saw Sharpener, of which the following is a specification.

Our invention relates to improvements in cotton-gin saw-sharpeners, and has for its object to provide a simple and efficient sharpener, which may be readily and quickly applied to and readjusted upon the saw-arbor of a cotton-gin; to provide means whereby the angle of inclination between the files may be adjusted to suit the bevel of the teeth of the saws; to provide means for adjusting the point of intersection of the files to suit different sizes of saws; to provide a simple and effective means for feeding the saw and for adjusting the throw of such feeding mechanism to suit saws having different lengths of teeth; to provide means for adjusting the pressure of the files upon the teeth of the saw; and finally to provide means for removing the files from contact with the teeth at the end of each filing operation to permit of the readjustment of the frame for another saw after scoring the teeth of the dressed saw.

Other objects and advantages of the invention will appear in the following description, and the novel features thereof will be particularly pointed out in the appended claims.

Referring to the drawings:—Figure 1 is a perspective view of a sharpening device embodying our invention applied in an operative position to a saw-arbor of a cotton-gin. Fig. 2 is a vertical central section of the same. Fig. 3 is a rear view. Fig. 4 is a horizontal section on the line 4—4 of Fig. 2. Fig. 5 is a detail view, partly in section, of one of the pitmen for communicating motion from the crank-disk to the reciprocating file-carrying rods. Fig. 6 is a front view. Fig. 7 is a detail sectional view of the socket for the attachment of a file. Fig. 8 is a detail view showing the connection between the crank disk and the pitmen.

Similar numerals of reference indicate corresponding parts in all the figures of the drawings.

1 indicates a horseshoe frame having the side legs or standards 2 adjustably connected to the lower end thereof by means of the transverse bar 3. This bar is secured in keepers 4 which are connected adjustably to the lower ends of the side arms of the frame by means of extensions 5 fitted in channels 6 formed in said arms and held in the desired relative positions by means of the bolts 7 engaging slots 8 in the arms. The standards 2 are provided at their upper ends with eyes 9 fitted upon the extremities of said transverse bar and secured in place at the desired intervals by means of the set-screws 10. By means of these set-screws the inclination of the frame with relation to the standards may be varied for a purpose hereinafter explained, and the standards terminate in yokes or seats 11, which are adapted to fit over and bear upon the portions of the saw-arbor of a cotton-gin between the saws or upon the sleeves employed to space the saws upon said arbor.

12 represents the reciprocating file-carrying rods which are fitted slidably at their upper ends in the guides 13 secured to the upper end of the frame and at intermediate points in the resilient guides 14 arranged in a transversely disposed guide-frame 15 secured to the side arms of the main frame. These resilient guides consist of blocks fitting slidably in said guide-frame and pressed outward to hold the files in contact with the teeth of the saw under treatment by means of the pressure springs 16. Set-screws 17 are fitted in suitable bores in the ends of the guide-frame to adjust the tension of the springs. The files 18 which are secured to the lower ends of the file-carrying rods are held in place by means of the sockets 19 which are threaded to receive the extremities of the file-carrying rods, and are provided with triangular openings 20 which are somewhat smaller than the upper end of the files. The extremities of the file-carrying rods are provided with axial bores 21 to receive the stems 22 of the files, and therefore when the files are fitted in the triangular openings at the lower ends of the sockets and the latter are threaded upon the extremities of the rods, the stems of the files fit in the axial bores of the file-carrying rods, the shoulders of the files bear against the terminals of the rods, and the upper ends of the body portions of the files are forced snugly and firmly into the

triangular openings of the sockets. By this arrangement the files are held against independent vibration, and any looseness occurring during the operation of the mechanism may be taken up by tightening the sockets. The guides 13 are adjustably secured to the main frame by means of stems 23 engaging segmental slots 24 in the head or upper end of the frame and engaged at their rear ends by the adjustable nuts 25. By adjusting these guides at different points in the slots the angle of inclination between the file-carrying rods may be varied to cause the files to intersect at different angles and at different distances from the arbor of the gin-saw, and as the resilient guides above described are arranged loosely in the slots of the guide-frame, such variations of inclination in the file-carrying rods do not cause binding of the latter.

26 represents a crank-disk carrying eccentric spindles 27, which are connected, respectively, by means of the pitmen 28 to intermediate points of the file-carrying rods. The upper ends of these pitmen are provided with suitable bearings 29, and their lower ends are swiveled to the transversely perforated blocks 30, said blocks being provided with set-screws whereby they may be secured at the desired points of the file-carrying rods.

The shaft 31 of the crank-disk carries between suitable cheek-plates 32 a spur-gear 33 which meshes with a similar gear 34 carried by the driving shaft 35, the latter being provided with a suitable operating handle 36.

The feeding mechanism for moving the saw forward after dressing each tooth in order to bring the succeeding tooth in position for treatment is constructed as follows:—37 represents a cam-shaft mounted in suitable bearings 38 in cross-bars 39 connecting the arms of the main frame near their lower ends, said shaft being provided at its rear end, which is extended for a considerable distance beyond the plane of the rear side of the frame, with a cam 40, and 41 represents a rocking-lever carried by a rock-shaft 42 suitably journaled upon the lower ends of the arms of the frame and provided at its lower extremity with the toothed fingers 43 for engaging the teeth of the saw. These fingers are pivotally connected to the lower end of the rocking-lever, are arranged in a slot or bifurcation in said lever, and are provided with a series of perforations 44 for the reception of the pivot-pin 45, whereby the interval between the teeth 46 at the extremities of the fingers may be varied to suit the intervals between the teeth of the saw which is being sharpened. It will be seen that by an oscillatory movement of the lever the saw may be advanced at each movement a distance corresponding with the length of throw of such lever, and that in case one of the teeth of the saw is broken the saw will be advanced by reason of the use of two fingers. The rocking-lever is provided at its upper end with a rearwardly extending stud 47 which is arranged in the path of the diametrically opposite enlargements 48 of the above mentioned cam. Said cam consists of a disk 49 having a hub 50 which is secured to the cam-shaft by means of a set-screw 51, and the disk is beveled upon its front side, whereby as the diametrically opposite enlargements engage the stud of the rocking-lever, said stud is caused to assume a position corresponding with the bevel of the cam. By adjusting the cam toward and from the plane of the main frame the extent of throw of the rocking-lever may be varied to suit saws having their teeth arranged at different intervals. The reason for this operation of the rocking-lever is that as the enlargement of the cam approaches the stud the latter is pushed from the axis of the cam, (this being possible from the fact that the pressure is not in alignment with the body of the lever,) and said pressure from the axis of the cam causes the stud of the lever to slide on the beveled or undercut edge of the cam. It will be understood that a very slight movement of the lever is necessary to accomplish the requisite feeding of the saw, and the metal surfaces of the cam and stud, (which may be polished if preferred,) do not cause sufficient friction to prevent the sliding movement just described. Owing to the use of the stud which projects outward perpendicular to the line of the body of the lever, the actual lever is represented by an imaginary line connecting the fulcrum of the body portion of the lever with the point of contact of the cam with the stud, and hence it will be understood that by adjusting the cam upon its spindle a greater or less throw of the lever may be attained, owing to the fact that such adjustment varies the length of the said "actual" lever, or the distance between the fulcrum of the lever and the point of contact of the cam with the stud.

The front end of the cam-shaft constitutes one member of a trip-mechanism for removing the files from contact with the saw during the time of the feeding movement of the latter and for the purpose of allowing the frame to be readjusted for a different saw. The cam-shaft is provided at opposite points with enlargements 52, which are adapted to engage the inwardly extending arms of the bell-crank trip-levers 53, the lower ends of the vertical arms of such levers being in contact with the outer ends of the resilient guiding-blocks for the file-carrying rods, whereby when an enlargement 52 encounters the inwardly extending-arms of the trip-levers the lower arms thereof are swung inward, thereby swinging the lower end of the file-carrying rods in a similar direction and removing the files from contact with the saw, see Figs. 4 and 6. The cam-shaft is provided at a point between the transverse bars in which it is mounted with a gear 54, which meshes with the master-gear carried by the driving-shaft.

This being the construction of our im-

proved mechanism, the operation thereof is as follows:—The rotation of the driving shaft by means of its handle causes a rapid rotation of the crank-disk by reason of the small gear carried by the shaft of said crank disk, and thereby produces a rapid reciprocation of the file-carrying rods, but the cam-shaft, on the other hand, rotates slowly and is in position to trip the files from the saw and feed the saw forward when the filing of the tooth has been completed. In this way the operation of the mechanism is continuous, and when the parts are properly adjusted to suit the size of the saw, the bevel of the teeth, and the intervals between the teeth, a saw may be dressed rapidly and efficiently, and the readjustment of the device to bring it in operative relation with the different saws on the arbor may be accomplished without loss of time. The adjustment to suit the inclination of the teeth is accomplished by varying the inclination of the main frame with relation to the standards by means of the set-screw with which said standards are provided at their upper ends.

Various changes in the form, proportion and the minor details of construction may be resorted to without departing from the spirit of the invention or sacrificing any of the advantages thereof.

Having described our invention, what we claim is—

1. In a device of the class described, the combination with a frame, and means for supporting the same upon a saw-arbor, of reciprocating file carrying rods, laterally slidable guides for said rods, angle-levers operatively connected to the guides, a cam-shaft carrying enlargements to encounter said levers at intervals to move the sliding guides laterally and disengage the files from the teeth of a saw, and means for operating the reciprocating rods and said cam-shaft, substantially as specified.

2. In a device of the class described, the combination with a frame, and means for supporting the same upon a saw-arbor, of file-carrying rods, means for operating said rods, a rocking lever, means for communicating motion thereto from the driving mechanism, and oppositely extending pivotal fingers carried by the rocking lever and provided with terminal teeth for engaging the teeth of a saw, said fingers having spaced perforations for the reception of a pivot-pin, whereby they are secured to the rocking-lever, substantially as specified.

3. In a device of the class described, the combination with a frame, and means for supporting the same upon a saw-arbor, of file-carrying rods, and means for operating the same, a cam-shaft connected to said operating means, a rocking lever having fingers for engaging the teeth of a saw and provided at its upper end with a perpendicularly disposed stud, and a cam adjustably connected to said cam shaft with its axis parallel with said stud and having a beveled or undercut periphery to engage and move the stud in a direction substantially parallel with its length, substantially as specified.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in the presence of two witnesses.

JOHN A. ROGERS.
DAVID C. BURNS.

Witnesses:
JOHN A. MUZZEY,
WILLIAM B. WOODALL.