

No. 720,416.

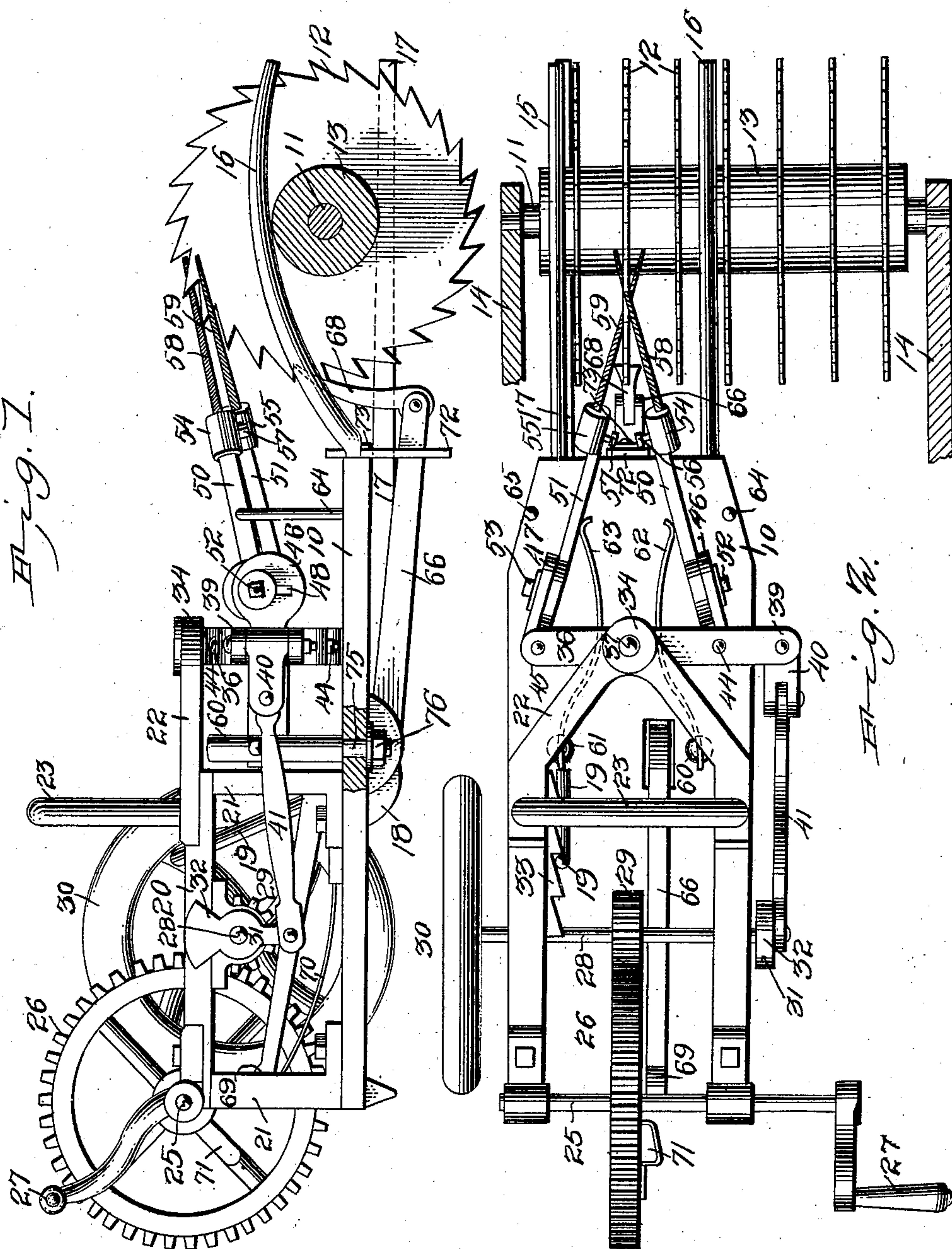
PATENTED FEB. 10, 1903.

J. S. GARNER.
GIN SAW SHARPENER.

APPLICATION FILED JULY 18, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses

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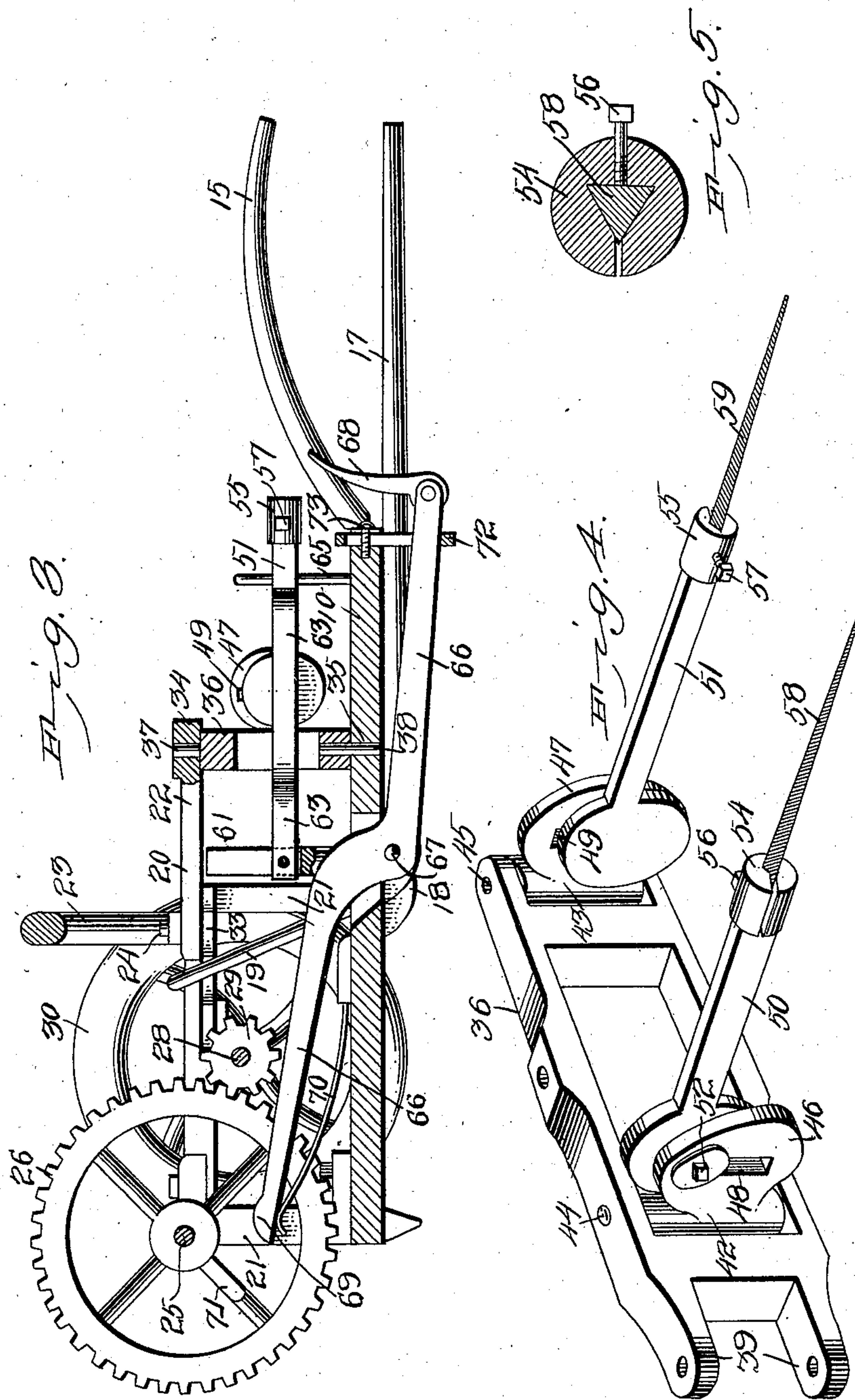
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UNITED STATES PATENT OFFICE.

JOHN S. GARNER, OF EFFINGHAM, SOUTH CAROLINA, ASSIGNOR OF ONE-HALF TO THEODORE J. CANNON, OF EFFINGHAM, SOUTH CAROLINA.

GIN-SAW SHARPENER.

SPECIFICATION forming part of Letters Patent No. 720,416, dated February 10, 1903.

Application filed July 18, 1902. Serial No. 116,085. (No model.)

To all whom it may concern:

Be it known that I, JOHN S. GARNER, a citizen of the United States, residing at Effingham, in the county of Florence and State of South Carolina, have invented a new and useful Gin-Saw Sharpener, of which the following is a specification.

This invention relates to improvements in machines for sharpening cotton-gin saws; and the object of the invention is to provide a machine simple in construction which will operate upon the saws without removing them from the mandrel or arbor and while they are mounted side by side; and the invention consists in certain novel features of construction, as hereinafter shown and described, and specified in the claims.

In the drawings illustrative of the invention, Figure 1 is a side elevation. Fig. 2 is a plan view. Fig. 3 is a longitudinal sectional elevation. Fig. 4 is a perspective view of the vibrating file-supporting frame detached. Fig. 5 is an enlarged sectional detail of the file-holding clutch.

The machine consists of a base or platform 10, upon which the mechanism is mounted and which will be suitably supported upon a standard, which is not shown in the drawings, as it forms no part of the present invention. The supporting-standard may be erected adjacent to the gin-frame, so as to bring the filing apparatus in proper relation to the saws, or the framework may be provided with supporting means for the saw-arbor. This part of the apparatus may be arranged as circumstances may require, and I do not, therefore, wish to be limited to any specific means for supporting the device relative to the frame of the gin or the saw-arbor forming a part thereof.

For the purpose of illustration a conventional mandrel or arbor is indicated at 11, a plurality of the gin-saws at 12, with the dividing-sleeves at 13, the latter generally of wood, the mandrel 11 being shown mounted at its ends in bearings 14, which may be a part of the gin-frame or a specially-constructed frame for temporarily supporting the mandrel while the saws are being sharpened.

Extending from the front end of the frame 10 are two curved arms 15 16, adapted to en-

gage two of the spacers 13 upon their upper sides between the saws and form a downwardly-acting support to prevent upward movement of the mandrel and its connected saws.

Pivotally supported beneath the base 10 is a rod or bar 17, extending beyond the end of the base 10 and engaging the under side of one of the spacers 14 between the saws, as indicated.

The bar 17 is pivotally supported in a hanger 18 beneath the base 10 and is extended upward therefrom through an aperture in the base and terminates in a handle 19, as shown, so that the outer free end of the bar 17 may be adjusted vertically by moving the handle 19 forward and backward, as will be understood, so that the free end of the bar 17 may be adapted to different sizes of the spacers 14, as hereinafter more fully explained.

Supported above the base 10 at its rear end is a frame 20, supported above the base by standards 21 and connected at its front end by a yoke-frame 22 and further supported by an arch-frame 23, the latter also forming the handle by which the machine may be moved from place to place.

The yoke-frame 22 rests in recesses in the forward end of the frame 20, and the feet of the arch-frame 23 rest upon the inner ends of the yoke-frame, the three parts 20 22 23 being united by bolts 24, as shown.

At its rear end the frame 20 is provided with a transverse shaft 25, carrying a gear 26 and provided with an operating-handle 27.

Transversely disposed beneath the frame 20 forward of the shaft 25 is a counter-shaft 28, carrying a pinion 29, with which the gear 26 engages, and also provided on one end with a balance-wheel 30 and on the other end with a crank 31, the latter preferably provided with a counterbalance-weight 32.

The frame 20 will be provided with a notched strip 33, with which the handle 19 engages, as shown, so that the bar 17 may be sustained at whatever point desired in engagement with the spacers 14, as will be obvious.

The forward end of the yoke 22 is provided with a bearing 34, disposed in vertical alignment with a similar bearing in the base 10, and between these bearings is pivotally sup-

ported a swivel-frame 36, the latter having a stud 37, extending from its upper part and engaging the bearing 34, and with a similar stud 38, extending from its lower part and engaging the bearing 35, as shown. One end of this frame 36 is horizontally forked, as shown at 39, and within this forked end is pivotally supported a link 40, the free end of the link vertically forked and pivotally supporting one end of a connecting-rod 41, while the other end of the rod is movably engaged with the crank 31. By this arrangement it will be obvious that the revolution of the crank 27 will transmit the motion of the shaft 25 through the gearing 26 29, the shaft 28, crank 31, connecting-rod 41, and link 40 to the vibrating frame 36.

Supported vertically between the sides of the frame 36 at points equidistant from the studs 37 38 are blocks 42 43, the blocks being held in place movably by vertical studs 44 45, passing downward through the frame 36 and also through the blocks, as shown.

Extending from the blocks 42 43, respectively, are plates 46 47, having vertical apertures 48 49, and engaging these plates by their inner ends are bars 50 51, each bar having a stud engaging its respective adjacent aperture 48 49, as shown, the studs being provided with nuts 52 53, respectively, so that the bars 50 and 51 may be firmly united to the plates 46 47 and supported at any desired point thereon. By this means it will be obvious that the bars 50 51 may be adjusted vertically upon the plates 46 47 to any desired point within the range of the apertures 48 49 and also adjusted at any degree of angularity or with the outer free ends of the bars adjusted vertically to any desired extent. It will also be obvious that by reason of the swivel connection between the blocks 42 43 and the frame 36 the outer ends of the bars 50 51 may be moved laterally to any extent required, and by reason of the two adjustments the free ends of the bars 50 51 are universally adjustable to any degree within the range of their adjusting means.

The bars 50 51 are adapted to support the files as shown, and to enable the files to be properly secured the bars are provided, respectively, on their outer ends with sockets or sleeves 54 55, each sleeve split longitudinally on one side and provided, respectively, with set-screws 56 57, adapted to engage the files 58 59 when forced into the sleeves, the "splits" in the sleeves providing for the expansion of the sleeves when the files are forced into them, and thus secure the requisite "grip" upon the files to coact with the set-screws to insure a firm connection between the files and the bars 50 51.

Extending upward from the base 10 just in the rear of the frame 36 are two posts 60 61, spaced apart and adapted to adjustably support springs 62 63, the latter extending forward and engaging the inner sides of the bars

50 51 and exerting their force to maintain the bars normally in their outward position.

Rising from the base 10 near its forward end are stops 64 65, adapted to be engaged by the bars 50 51 to limit their outward movement and prevent them from being thrown too far outward when the machine is not in use.

The posts 60 61 are split vertically, and the springs 62 63 engage these splits by their rear ends, the posts being provided with transverse clamp-bolts which are adapted to bind said springs to the posts by bringing the split ends of each post closely together and supported adjustably in the posts. It will be obvious by this construction that the springs may be very quickly adjusted vertically in the posts to adapt them to correspond to the adjustment of the bars 50 51, so that they will operate in harmony.

Centrally disposed beneath the base 10 is an arm 66, pivoted by its inner end in a bearing 67 beneath the base 10 and extending forward and provided in its free end with a movable pawl 68, the latter adapted to engage the teeth of one of the gin-saws 12, as shown, while the rear end of the arm 66 extends upward through an aperture in the base 10 and thence rearwardly, as at 69, beneath the shaft 28 and ending beneath the shaft 25 and adapted to be maintained normally in its upward position by a spring 70. By this means the pawl 68 will be moved by the spring 70 and maintained normally in its downward position thereby.

Attached to the gear 26 is a cam or block 71, adapted to engage the outer end 69 of the lever once at each revolution of the gear and depress it, and thus cause the pawl 68 to engage the teeth of the gin-saws and revolve them the distance of the throw of the lever and its pawl, as will be obvious.

The lever 66 69 will be proportioned as to length and as to its pivotal point, so that the throw will be equal to the distance between each pair of the teeth of the saws, so that every time the cam-block 71 acts on the lever it will cause the pawl 68 to revolve the saw the distance of one tooth.

The machine will be arranged to be moved longitudinally of the saw-arbor, or the saw-arbor moved transversely of the machine, so that the files may be caused to act upon the saws consecutively, and in operating the device the saw to be acted upon will be placed opposite the center of the machine or in alinement with the studs 37 38 and the guides 15 16 and the bar 17 properly adjusted to engage the spacers and prevent any vertical or longitudinal movement of the saws or the arbor supporting them. The pawl 68 is then engaged with one of the teeth of the saw to be sharpened, which, as before stated, is the saw which is in central alinement with the base 10 and the studs 37 38, so that the files are disposed at equal distances on each side of the saw. The files are then drawn

together and placed in engagement with the teeth to be sharpened, one file being connected to one tooth on one side and the other file being engaged to the next tooth above or below on the opposite side, the springs 62 63 keeping the files in operative engagement with the teeth of the saw. Then as the crank 27 is revolved the files are drawn rapidly back and forth across the teeth and perform their work.

By arranging the wheel 26 larger than the pinion 29 the files are caused to vibrate a number of times while the crank 27 is making one revolution, and the proportionate sizes of these gears will be such that the files will sharpen one pair of teeth upon opposite sides while the crank and the shaft 25 and its wheel 26 are making one revolution, so that the cam-block 71 will cause the pawl 68 to move the saw forward only after the tooth being acted on has been sharpened. Generally three or four vibrations of the files will be sufficient to sharpen a tooth. Hence the wheel 26 will be three or four times the size of the pinion 29; but these dimensions may be varied, if required, so as to cause the files to make a greater or a less number of strokes at each revolution of the crank 27, and I do not, therefore, wish to be limited to any specific proportions of the parts, as they may be varied as circumstances may determine.

The arm 66, which is technically known as the "gummer-arm," will be supported where it passes beyond the base 10 by an adjustable keeper or guide 72, which permits the necessary vertical movement to the gummer-arm, but will prevent any lateral movement thereto.

The keeper 72 is vertically adjustable by means of the set-screw 73, so that the arm 66 may be readily adjusted vertically to adapt the movement of the pawl 68 to the teeth of the saws.

When the device is operated, the balance-wheel 30 and the balance-counterweight 32 insure the requisite steadiness of motion and cause the files to operate with more regularity and with greater precision, and thus produce a greater uniformity of action upon the saw-teeth.

The files employed are of the "stub" variety or with triangular "butt-ends" where they engage the sockets, and the cavities in the sockets will be formed correspondingly triangular, with the "split" at one of the apices of the triangle, as shown in Fig. 5, and with the set-screw extending through the flat side opposite the split, so that when the set-screw acts upon the stub end of the file it will force the opposite reversely-inclined edge into the split and cause it to act as a wedge to firmly bind the file end into engagement with the socket, and thereby insure a very rigid coupling between the parts.

The extensions 46 47, it will be noted, are formed with comparatively broad vertical

surfaces, and the ends of the arms 50 51, which engage these portions, are correspondingly broadened, so that when clamped together by the nuts 52 53 a very firm coupling will be secured, which will add materially to the effectiveness of the device by obviating any tendency of the bars and the files supported by them to yield to the side or torsional strains to which they may be subjected.

With this simple device the teeth of the gin-saws may be successively sharpened, the only attention the machines require being the moving of the files from tooth to tooth, as the gummer automatically revolves the saws a tooth at a time, and the adjustment of the machine from saw to saw along the mandrel.

The parts may be varied in proportions and changed and modified in minor particulars without departing from the principle of the invention or sacrificing any of its advantages.

The posts 60 61 pass downward through the base 10 by studs 75 and provided with nuts 76 on their lower ends below the base, whereby the posts are rendered revoluble in position and adapted to be clamped firmly to the base at any desired point. By this simple means the springs 62 63 may be moved laterally to increase or decrease their tension and correspondingly regulate the pressure upon the bars 50 51 and the files 58 59. By this means the files may be made to cut with increased or decreased speed as required to adapt them to the condition of the teeth of the saws, as will be obvious. Thus when a saw which is very dull is to be filed the tension may be increased to cause the files to act more rapidly, so that a dull saw may be filed in the same time as one which is comparatively sharp, so that the saw may be sharpened perfectly at one revolution no matter what the condition of its teeth may be. This is a very important feature of the invention and adds materially to its efficiency, as the machine by means of this feature is rendered adjustable to adapt it to the condition of the teeth of the saw to be sharpened.

Having thus described my invention, what I claim is—

1. In a machine of the character described, a base-frame, a vibrating frame permanently mounted thereon, file-supporting bars pivotally connected to said vibrating frame, springs disposed to maintain said bars yieldably distended, independent means to adjust said bars, and independent means to adjust said springs, substantially as and for the purpose described.

2. In a machine of the character described, a base-frame, a yoke-frame supported thereon and spaced therefrom, a vibrating frame pivotally supported between said base-frame and said yoke-frame, means to operate said vibrating frame, file-supporting bars pivotally connected to said vibrating frame, said bars be-

ing adjustable on said frame independently thereof, and adjustable springs adapted to maintain said bars yieldably distended.

3. In a machine of the character described,
5 a base-frame, a vibrating frame mounted to vibrate upon said base-frame, blocks supported movably in said vibrating frame and having wings extending therefrom, and file-supporting bars adjustably connected to said ex-
10 tensions.

4. In a machine of the character described, a base-frame, a yoke-frame supported thereon and spaced therefrom, a vibrating frame pivotally supported between said base and yoke
15 frames, blocks spaced apart and pivoted in said vibrating frame, wings extending from said blocks, said wings having vertical slots therein, file-supporting bars having studs adapted to engage said vertical slots and to
20 be secured to said wings, springs disposed between said bars adapted to maintain them normally distended, means for adjusting said

springs vertically, and stops carried by said base-frame and adapted to limit the outward movement of the file-supporting bars.

5. In a machine of the character described, a base-frame, a vibrating frame mounted thereon, file-supporting bars connected to said vibrating frame, curved bars spaced apart and extending forwardly from the base-frame on either side of the file-supporting bars, a bar pivoted to the base-frame and extending forwardly therefrom below the said curved bars and means to adjust said pivoted bar vertically and secure it in such ad-
25 30 35
justment.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

JOHN S. GARNER.

Witnesses:

J. R. McCOWN,
GRACE MAYSMITH.