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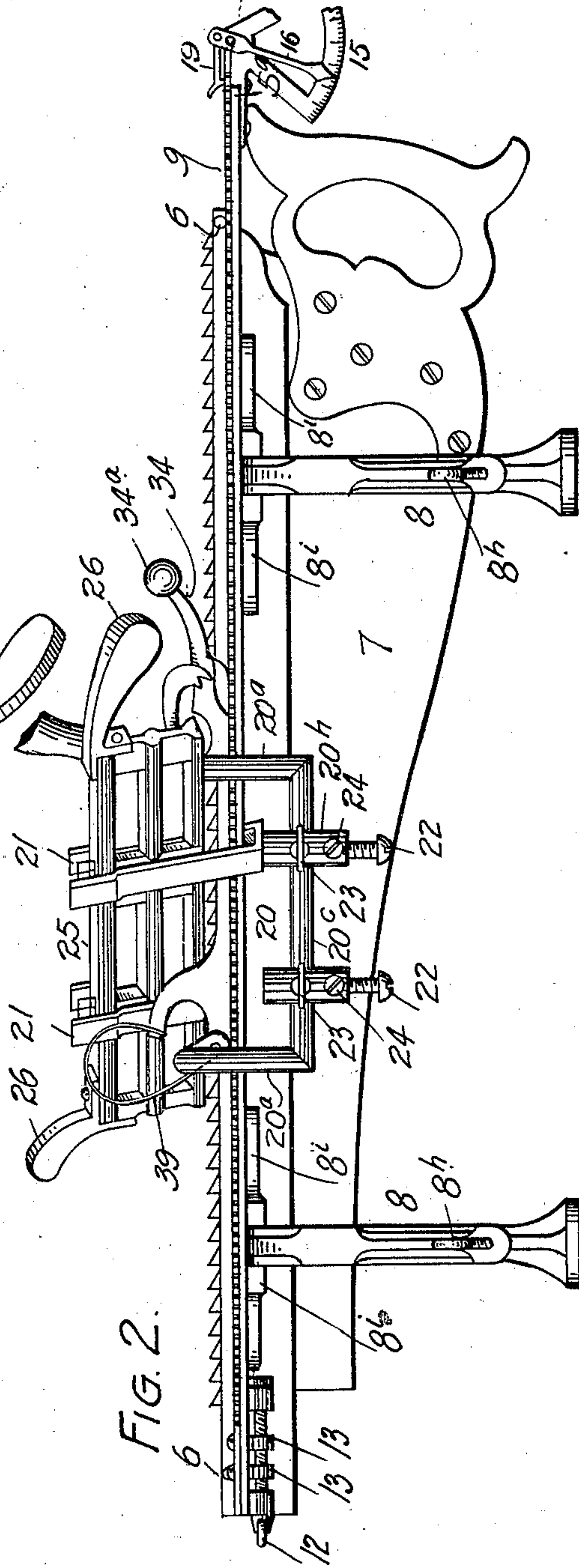
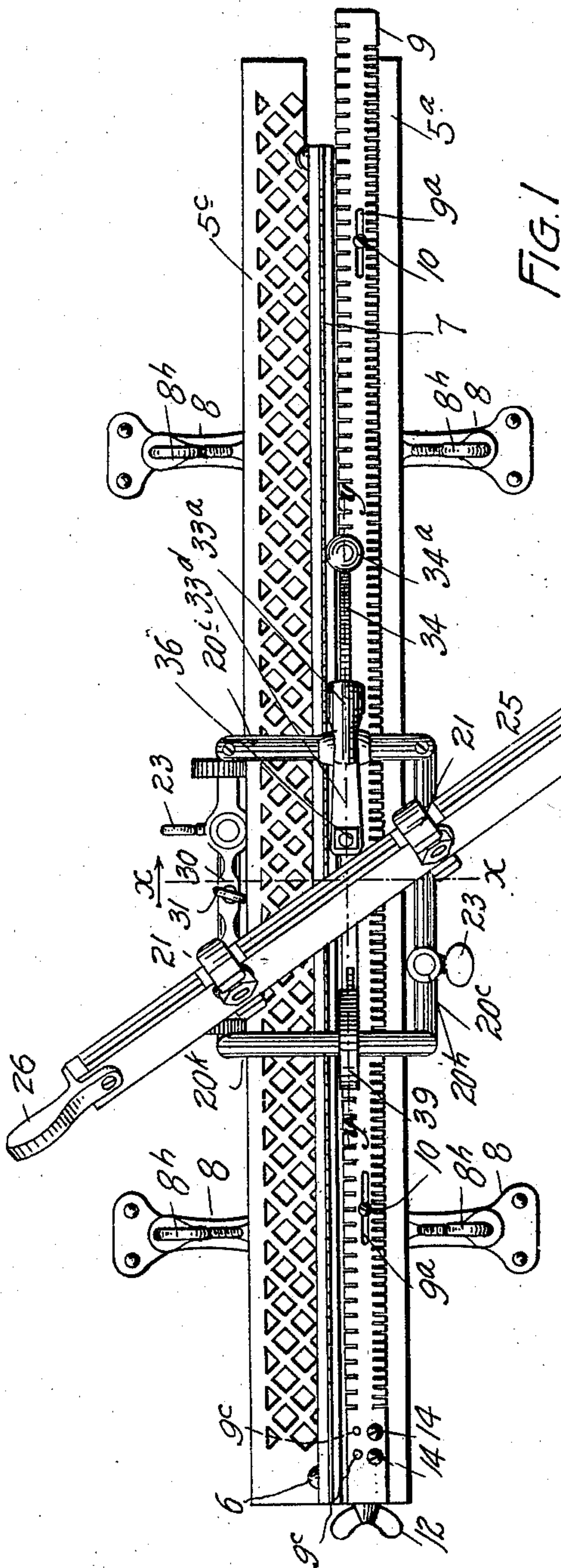
Patented Jan. 28, 1902.

N. KALL.
SAW SHARPENER.

(Application filed July 2, 1901.)

(No Model.)

3 Sheets—Sheet 1.



WITNESSES:
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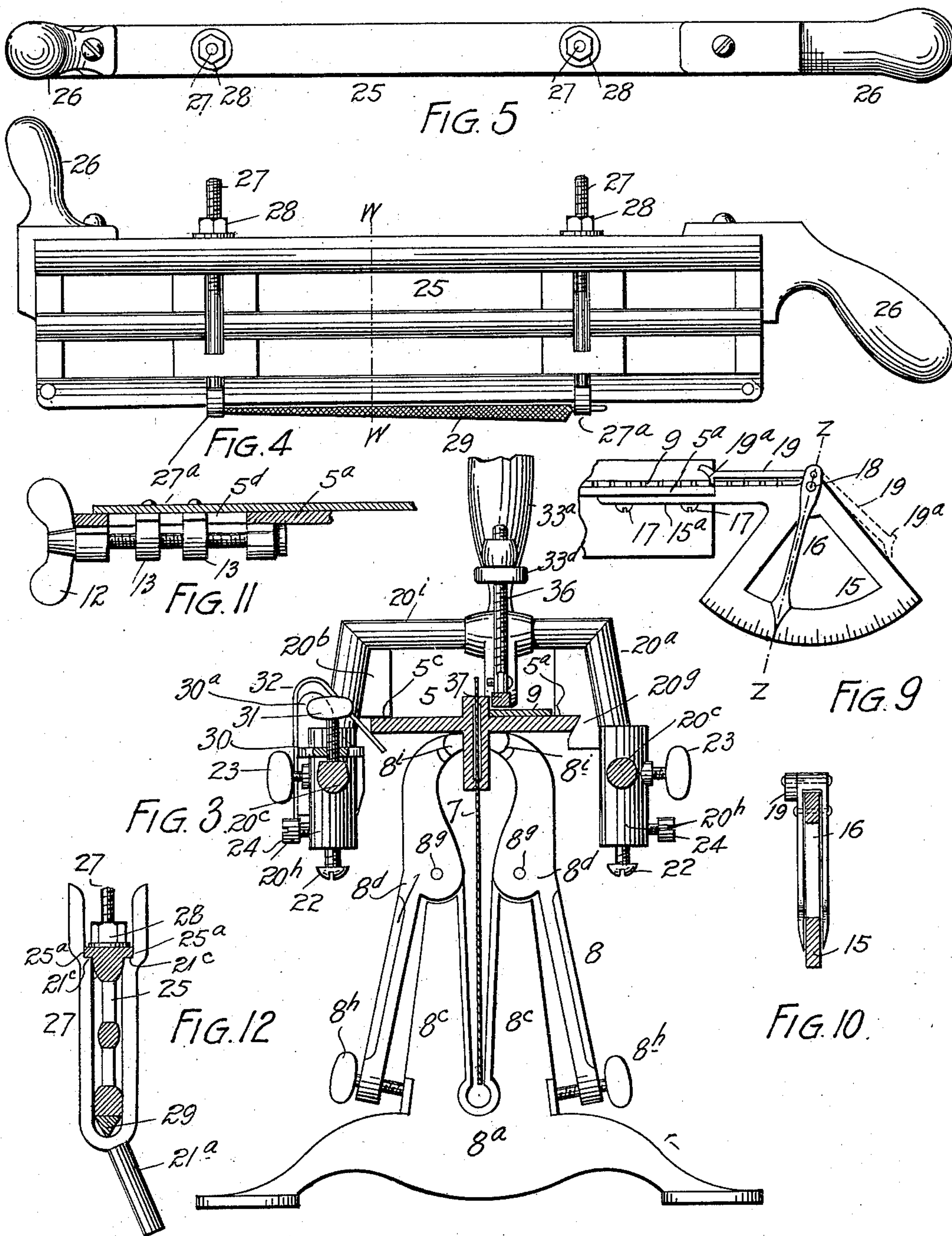
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(No Model.)

3 Sheets—Sheet 2.



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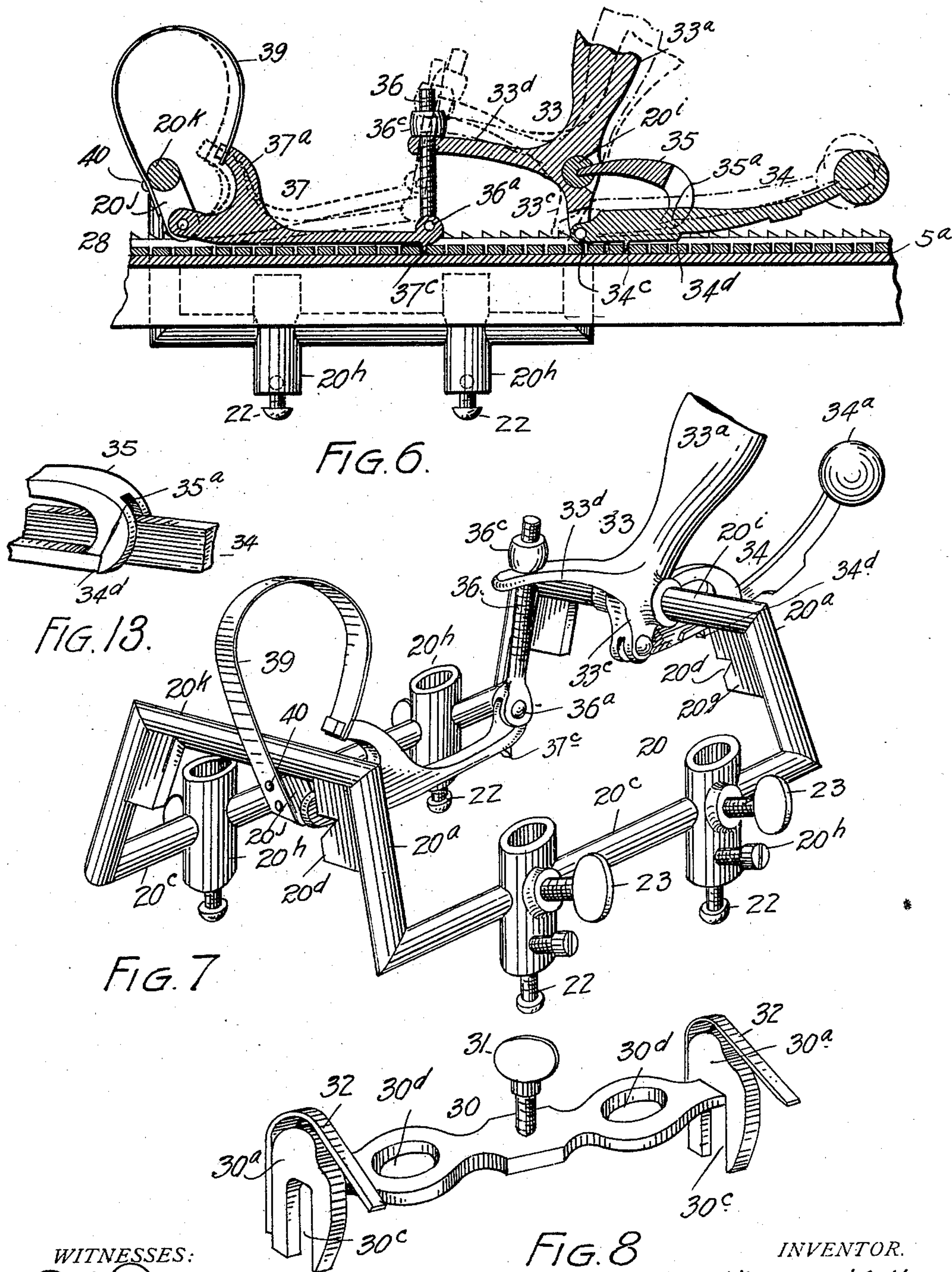
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3 Sheets—Sheet 3.



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FIG. 8
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UNITED STATES PATENT OFFICE.

NICOLAUS KALL, OF DENVER, COLORADO.

SAW-SHARPENER.

SPECIFICATION forming part of Letters Patent No. 692,201, dated January 28, 1902.

Application filed July 2, 1901. Serial No. 66,924. (No model.)

To all whom it may concern:

Be it known that I, NICOLAUS KALL, a citizen of the United States of America, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Saw-Sharpener; and I do 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 appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in saw-sharpeners, being more especially intended for sharpening handsaws, my object being to provide a device which shall enable the operator to file a saw with greater ease and accuracy than can be done by ordinary means and methods; and to this end the invention consists of the features, arrangements, and combinations hereinafter described and claimed, all of which will be fully understood by reference to the accompanying drawings, in which is illustrated an embodiment thereof.

In the drawings, Figure 1 is a top or plan view of my improved saw-sharpening apparatus. Fig. 2 is a side elevation of the same. Fig. 3 is a section taken on the line *x x*, Fig. 1, the file-holder and its guides being removed and the parts shown on a larger scale. Figs. 4 and 5 are side and top views, respectively, of the file-holder, the parts being shown on a larger scale. Fig. 6 is a fragmentary longitudinal section taken on the line *y y*, Fig. 1, the file-holder and the guides being removed and the parts shown on a larger scale. Fig. 7 is a perspective view of the carriage, the hand-lever mounted thereon being partly broken away and the parts shown on a larger scale than in Figs. 1 and 2. Fig. 8 is a perspective view of the carriage-tightener or tension device. Fig. 9 illustrates an indicating device attached to one extremity of the carriage-track, the hand of the indicator being connected with the gage-plate to indicate the degree of the latter's movement. Fig. 10 is a section taken of the line *z z*, Fig. 9. Fig. 11 illustrates the feed-screw, which is located at the extremity of the gage-plate remote from the indicating device. Fig. 12 is a section taken through the file-holder on the line *w w*,

Fig. 4, one of the file-holder guides being shown in elevation. Fig. 13 is a perspective view illustrating the locking connection between the parts 34 and 35.

The same reference characters indicate the same parts in all the views.

Let the numeral 5 designate the carriage-track, which is composed of two members 5^a and 5^c, provided with upper and lower flanges. The two parts of the track are connected together by screws 6, passed through their upper flanges, which are shorter than the lower flanges. The blade of the saw 7 to be sharpened is passed between the two track members in such a manner that its teeth protrude above the upper flanges to permit access to them for sharpening purposes. The screws 6 are located beyond the saw extremities. The saw is secured in place between the track members by two clamps 8, each composed of a cast standard 8^a, having two upwardly-projecting arms 8^c, to whose upper extremities are respectively fulcrumed at 8^e the clamping-levers 8^d, whose upper arms or jaws grasp the lower vertical flanges of the carriage-track. The lower extremities of the levers are provided with threaded openings, through which are passed set-bolts 8^h, preferably having heads adapted to be grasped by the thumb and finger for adjusting purposes. As these bolts are screwed inwardly against the standards the lower arms of the clamping-levers are thrown outwardly and their upper arms inwardly, causing the latter to grasp the track members and hold the saw securely in place. The upper extremities of the clamping-jaws extend longitudinally of the track on opposite sides of the standards, as shown at 8ⁱ, a suitable distance to properly perform their function. Although but two clamps are shown, it is evident that more may be employed, if desired. Mounted on the upper side of the track member 5^a is a gage-plate 9, provided with two rows of notches or recesses, which, as shown in the drawings, are formed by cutting slots in the opposite edges of the plate. The slots in the two edges are different distances apart and the plate is reversible, whereby either edge of the plate may be brought close to the upper flange of the track adjacent the saw. The distance between the slots of the gage-plate must be regulated by

the distance apart of the saw-teeth. It is my intention to have eight different gage-plates for each device, whereby sixteen saws having teeth differently spaced may be sharpened. The distance between the slots is the width of two saw-teeth, since in sharpening a saw only one edge of each tooth is sharpened as the carriage travels the length of the track, since the opposite edges of each tooth are oppositely beveled, and the file-holder must be held in two different positions in order to engage and sharpen the differently-beveled tooth edges.

The gage-plate is attached to the track by means of screws 10, passing through longitudinal slots 9^a, formed in the plate and entering threaded openings in the track. This plate is adjustable on the track in order to bring its slots in proper relative position to correspond with the position of the saw-teeth when the saw is first inserted. This adjustability is effected by means of a thumb feed-screw 12, which is journaled in suitable bearings attached to the under side of the track member 5^a. The feed-screw is threaded to engage the threaded openings of two nuts 13, secured to the under side of the gage-plate and arranged to slide in a slot 5^d, formed in the track member. The nuts are secured to the gage-plate by screws 14, fitting plain openings formed in the gage-plate and threaded openings in the nuts, whereby as the feed-screw is turned the gage-plate is moved in one direction or the other, as desired.

Secured to the extremity of the track member 5^a remote from the feed-screw is a graduated segmental plate 15, which is straddled by a lever-like pointer 16, whose arrow end is made to move adjacent the graduated surface of the plate 15 as the gage-plate is moved. The segmental plate is secured to the track member by screws 17, passed through an arm 15^a of the plate and threaded in the track. The pointer is fulcrumed at 18 in the upper part of the plate 15, and to a projection above the fulcrum where its two members are united is hinged an arm 19, having a tooth 19^a, adapted to enter a notch or slot of the gage-plate, whereby the pointer is actuated as the gage-plate is moved. The function of the segmental plate is to indicate the degree of movement of the gage-plate, which otherwise it would be difficult to note. When it is not desired to employ the pointer, it may be disengaged from the gage-plate and thrown to the position shown by dotted lines in Fig. 9.

When it is desired to adjust the gage-plate, the screws 10 are of course loosened. When, however, the plate is properly adjusted, the screws are again tightened to retain the gage-plate in the adjusted position. The carriage 20 is slidably mounted on the track and carries the devices which cooperate with the gage-plate to actuate the carriage. This carriage, as shown in the drawings, consists of an integral casting composed of two inverted-U-

shaped extremities 20^a, connected by lower side pieces 20^c. Each member 20^a is provided with a lug 20^g, in which is formed a V-shaped groove, slot, or recess 20^d, which receives the correspondingly-shaped edge of the member 5^a of the track. On the opposite side the carriage is provided with lugs 20^b, whose lower extremities rest on the member 5^c of the track.

Mounted on and preferably formed integral with each bar 20^c of the carriage are two cylindrical parts 20^h, occupying a vertical position and bored to form sockets for the file-holder guides 21. Each of these guides has a U-shaped upper portion forming oblique angles with its lower cylindrical portion 21^a, which is adapted to fit into one of the sockets of the carriage. The vertical position of these guides is determined by screws 22, screwed into openings formed in the bottoms of the parts 20^h, whereby the extremities of the screws engage the lower extremities of the guides. These guides are tightened in their sockets by thumb-screws 23, and the screws 22 when properly adjusted are locked in place by screws 24, threaded in the walls of the sockets at right angles to the screws 22. The file-holder, which is supported by the guides, consists, as shown in the drawings, of a rectangular frame 25, having a handle 26 at each end and two bolts 27 passed therethrough edgewise and provided with adjusting-nuts 28 at one extremity and eyes 27^a at their opposite extremity, in which eyes the extremities of the file 29 are inserted. The file is fastened or secured tightly to the holder. The upper part of the frame 25 is provided with ledges 25^a on opposite sides, which ledges engage shoulders 21^c, formed on the arms of the guides, when the file-holder is in place.

The carriage may be tightened on the track by means of a vertically-movable plate 30, whose extremities are provided with guides 30^a, extending both above and below the plate. The lower portion of each guide is provided with a slot 30^c, which straddles the bar 20^c on one side of the carriage. The plate 30 is provided with openings 30^d, through which the upper extremities of the parts 20^h of the carriage pass and whereby the plate 30 is maintained in position on the carriage. Threaded in the center of the plate is a thumb-screw 31, whose lower extremity bears against the bar 20^c of the carriage. By turning this screw the plate is adjusted vertically for the purpose of regulating the tension of the carriage on the track through the instrumentality of leaf-springs 32, which are secured to the guides 30^a on one side and pass upwardly over the top of the guides and thence inwardly under the track member 5^c, which they engage. Hence as the plate 30 is raised by turning the screw down the springs 32 are forced upwardly against the under side of the track, whereby the springs are placed under tension and the carriage held more or less tightly on the track, as desired.

In this specification the extremity of the

mechanism farther to the left in Figs. 1 and 2 is termed the "front" and the opposite end the "rear."

Upon the rear extremity of the carriage is mounted and fulcrumed a hand-lever 33, having a long arm 33^a projecting above the carriage and a short arm 33^c projecting below the top bar 20ⁱ of the carriage extremity. To the arm 33^c of the lever is pivotally connected the forward extremity of an arm 34, which extends rearwardly from its connection with the lever, its rear extremity being enlarged to form a weight, as shown at 34^a. This arm 34 is provided with a tooth 34^c, projecting downwardly and adapted to engage the notches of the gage-plate. Rigidly secured to the bar 20ⁱ at the rear extremity of the carriage is a rearwardly-projecting arm 35, whose free extremity is curved downwardly and provided with a notch 35^a, adapted to engage a laterally-projecting offset or lug 34^d, formed on the arm 34, whereby the arm 35 supports the weighted arm above and out of contact with the gage-plate when it is desired to slide the carriage freely on the track.

The lever 33 is provided with a forwardly-projecting arm 33^d, having an opening in its forward extremity, through which passes a bolt 36, whose lower extremity is hinged, as shown at 36^a, to the rear end of a lever 37, whose forward extremity is fulcrumed, as shown at 38, on a depending arm 20^j, which, as shown in the drawings, is formed integral with the upper bar 20^k of the forward extremity of the carriage. The lever 37 is also provided with an upwardly and forwardly projecting arm 37^a, to whose free extremity is connected one end of a leaf-spring 39, whose opposite extremity is secured to the carriage, as shown at 40. The rear portion of the lever 37 is provided with a downwardly-projecting tooth 37^c, adapted to engage the notches of the gage-plate. Before beginning the saw-sharpening operation the saw to be filed is placed between the track members 5^a and 5^c and secured by the clamps 8. The carriage is then placed in position on the track from one end and the tension device 30 regulated by adjusting the thumb-screw 31. The file-holder guides 21 are placed in their sockets on the carriage, suitably adjusted and tightened by means of the screws 22 and 23, the screws 22 being locked in the adjusted position by the small screws 24. One guide 21 is placed in the rear socket 20^h on one side of the machine and the other guide in the forward socket 20^h on the other side of the machine, whereby the file when in position occupies a plane passed diagonally across the line of the saw-teeth in order to hold the file in position to give the teeth the proper bevel during the sharpening operation. The gage-plate must be adjusted to bring its notches, recesses, or slots into proper position relatively to the position of the saw-teeth. The sharpening operation is accomplished by grasping one handle of the file-holder and

moving the latter back and forth, the file being in contact with the teeth to be sharpened. During this time the tooth 34^c of the arm 34 and the tooth 37^c of the arm 37 are in engagement with notches of the gage-plate, the parts being in the position shown in full lines in Figs. 2 and 6. Assuming that the teeth edges of the saw upon which the file is acting are properly sharpened, the carriage must be moved forwardly a distance of two teeth, since when the file-holder is in one position—namely, that shown in the drawings—one edge only of each tooth is sharpened, and in order to sharpen the other edge, which is oppositely beveled, the file-holder must occupy the reverse diagonal position or a position crossing or intersecting the plane of the position shown.

During the sharpening operation the travel of the carriage is a step-by-step movement, whereby the file is brought into position to occupy every alternate space between the saw-teeth. This is accomplished by virtue of the feeding devices mounted on the carriage in connection with the gage-plate and will now be described in detail. Assuming that the parts are in the position shown in full lines in Fig. 6, the arm 33^a of the lever 33 is moved rearwardly, throwing its arm 33^c forwardly, lifting the tooth 34^c out of its notch or recess in the gage-plate, and moving the arm 34 forwardly until its tooth engages the notch of the gage-plate next in front. At the same time the lever-arm 33^d is raised and the lever 37 lifted to disengage its tooth 37^c from its notch or recess in the gage-plate. The parts are now in the position shown by dash-dotted lines in Fig. 6. The lever-arm 33^a is then moved forward to the full-line position in Fig. 6. During this movement the tooth 34^c resists the rearward movement of the lever-arm 33^c, and the carriage is thrust forward by virtue of its connection with the hand-lever, as heretofore explained. This forward movement of the carriage continues until the tooth 37^c of the lever 37 enters the next notch or recess of the gage-plate or the one immediately in front of that which it previously occupied. As the lever 37 is raised to the dash-dotted-line position in Fig. 6 the file and file-holder are raised sufficiently to pass over the saw-teeth during the forward travel of the carriage until the file has reached the proper position. Then as the lever-tooth 37^c drops into the forward notch of the gage-plate the file drops into the space between the saw-teeth whose edges are to be sharpened.

The tendency of the spring 39 is to hold the rear extremity of the lever 37 in contact with the gage-plate.

After the saw has been filed the full length on one side or when one edge of every tooth has been filed the lever-arm 33^a is moved rearwardly sufficiently to bring the parts to the broken-line position in Fig. 6. The weighted arm 34 is then raised to bring its lug 34^d into the plane of the notch in the free end of the arm 35. The action of the spring 39 work-

ing through the lever 37, the bolt 36, and the lever 33 then throws the lug of the arm 34 into the notch of the arm 35 and maintains it in that position, whereby the tooth of the lever 37 and the tooth of the arm 34 are both raised from the gage-plate. The carriage may then be moved forwardly to its original position. After this is done the file-holder guides 21 are changed to occupy the other two sockets of the carriage, so that the file-holder when in place will occupy a position crossing or intersecting the plane of its original position at suitable angles. The file-holder is then manipulated from the opposite side of the saw until each saw-tooth is filed or sharpened on its other edge. After each operation of sharpening one edge of two adjacent teeth the carriage is fed forward on the track by virtue of the lever 33, the arm 34, the bolt 36, and the lever 37, as heretofore described.

The gage-plate 9 is provided with an extra set of screw-openings 9^c for use when the gage-plate is reversed or turned over.

A nut 36^c is screwed upon the bolt 36 to form a bearing for the lever-arm 33^d.

At the rear end of the track members 5^a and 5^c part of the middle portion of said members is cut away so as to form an opening when the members are screwed together. This opening will permit the saw-handle to pass through, if necessary, in order to raise the blade to the proper height. The flanges of the track members above the handle of the saw are so shaped as to allow the saw to be raised to the desired height without removing the handle.

Having thus described my invention, what I claim is—

1. In a saw-sharpener, the combination of a track composed of two members, means for clamping the saw between the track members, and supporting the track in a suitably-raised position, a gage-plate mounted on the track, a carriage also mounted on the track, means for imparting to the carriage a step-by-step movement on the track, comprising a hand-lever fulcrumed on the carriage, a toothed arm pivotally connected with the lever, its tooth being adapted to engage the gage-plate which is provided with stops for the tooth, a toothed lever also fulcrumed on the carriage, its tooth being arranged to engage the stops of the gage-plate, and an operating connection between the hand-lever and the toothed lever; guides mounted on the carriage, and a file-holder movable in the guides, the arrangement being such that the file-holder occupies a position forming oblique angles with the plane of the saw.

2. The combination of a saw-clamp forming a track, a carriage mounted on the track, a gage-plate mounted on the carriage, means for imparting to the carriage a step-by-step movement on the track, comprising a hand-lever fulcrumed on the carriage, a toothed arm pivotally connected with the lever, its tooth being adapted to engage the gage-plate

which is provided with stops for the tooth, a toothed lever also fulcrumed on the carriage, its tooth being arranged to engage the stops of the gage-plate, and an operating connection between the hand-lever and the toothed lever; a file-holder, and means mounted on the carriage for guiding the file-holder in a line diagonally to the line of the saw-teeth.

3. The combination with a saw-holder and a track, of a carriage movable on the track, a gage-plate mounted on the track, a hand-lever fulcrumed on the carriage, an arm pivotally connected with the lever, a second lever also fulcrumed on the carriage and connected with the hand-lever, the said arm and the second lever being arranged to cooperate with the gage-plate as the hand-lever is operated, to impart a step-by-step movement to the carriage, substantially as described.

4. The combination with a saw-holder and a track, of a carriage movable on the track, a hand-lever fulcrumed on the carriage, an arm pivotally connected with the hand-lever, a second lever also fulcrumed on the carriage and connected with the hand-lever, and means mounted on the track and arranged to cooperate with the said arm and the second lever for imparting a step-by-step movement to the carriage as the hand-lever is operated.

5. The combination with a saw-holder, of a gage-plate mounted on the saw-holder, a carriage movable longitudinally on the saw-holder, a file-holder mounted on the carriage, and means also mounted on the carriage and cooperating with the gage, to impart a step-by-step movement of predetermined length to the carriage, said means comprising a hand-lever fulcrumed on the carriage, an arm pivotally connected with the carriage, and a second lever also fulcrumed on the carriage and connected with the hand-lever.

6. The combination with a saw-holder, of a gage attached to the saw-holder, a file-holder carriage movable on the saw-holder, and means mounted on the carriage and cooperating with the gage for imparting the required step-by-step movement to the carriage, said means comprising a hand-lever fulcrumed on the carriage, an arm pivotally connected with the carriage, and a second lever also fulcrumed on the carriage and connected with the hand-lever.

7. The combination with a saw-holder, of a gage-plate mounted thereon, and provided with recesses or notches arranged at regular intervals, a carriage movable longitudinally on the saw-holder, and means mounted on the carriage and engaging the notches of the gage for imparting a suitable step-by-step movement to the carriage, said means comprising a hand-lever fulcrumed on the carriage, an arm pivotally connected with the carriage, and a second lever also fulcrumed on the carriage and connected with the hand-lever.

8. The combination with a saw-holder, of a gage-plate adjustably attached to the saw-

holder and provided with recesses located at proper intervals, a file-holder carriage longitudinally movable on the saw-holder, and means mounted on the carriage and cooperating with the gage-plate to impart a suitable step-by-step movement to the carriage, said means comprising a hand-lever fulcrumed on the carriage, an arm pivotally connected with the carriage and a second lever also fulcrumed on the carriage and connected with the hand-lever.

9. The combination with a saw-holder and track, of a file-holder carriage movable longitudinally on the track, and a tension device mounted on the carriage and engaging the track for regulating the movement of the carriage.

10. The combination with a saw-holder and a track, of a gage-plate mounted on the track and provided with recesses located at suitable intervals, a file-holder carriage movable longitudinally on the track, a triple-armed hand-lever fulcrumed on the carriage, a toothed arm pivotally connected with one arm of the said lever, its tooth being adapted to successively engage the recesses of the gage-plate, a toothed lever also fulcrumed on the carriage, its tooth being arranged to engage the recesses of the gage-plate, an operating connection between one arm of the hand-lever and one arm of the toothed lever, the arrangement being such that as the hand-lever is actuated, a suitable step-by-step movement is imparted to the carriage substantially as described.

11. The combination with a saw-holder and a track, of a gage-plate attached to the track and provided with recesses located at regular intervals, a carriage longitudinally movable on the track, and mechanism for imparting a step-by-step movement to the carriage, said mechanism comprising a triple-armed hand-lever fulcrumed on the carriage, an arm pivotally connected with one arm of the hand-lever and provided with a tooth adapted to engage the recesses of the gage-plate, a toothed lever also fulcrumed on the carriage, a hinged bolt connecting one arm of the toothed lever with one arm of the hand-lever, and a nut applied to the bolt and forming a bearing for the hand-lever arm, the parts being constructed and arranged and operating substantially as shown and described.

12. The combination with a saw-holder and a track, of a recessed gage-plate mounted on the track, a file-holder carriage movable longitudinally on the track, and means mounted on the carriage for imparting a step-by-step movement to the latter, said mechanism comprising a triple-armed hand-lever, a weighted arm connected with one arm of the hand-lever and provided with a tooth adapted to engage the recesses of the gage-plate, a rearwardly-extending arm rigidly attached to the carriage and provided with a notch, the weighted arm having a lug adapted to engage

the notch of said arm, whereby the arm is raised to disengage its tooth from the gage-plate, a toothed lever also fulcrumed on the carriage, a flexible connection between the toothed lever and one arm of the hand-lever, and a spring attached to the carriage and engaging an arm of the toothed lever, whereby when the weighted arm is raised to engage the notch of the rigid arm of the carriage, the said spring acts to hold the parts in operative relation, the toothed parts being raised from the gage-plate, permitting the carriage to be moved at will on the track.

13. In a saw-sharpener, the combination with a saw-holder and a carriage-track, of a recessed gage-plate attached to the track, a file-holder carriage movable longitudinally on the track, a hand-lever fulcrumed on the carriage and provided with three arms, an arm being pivotally connected with one arm of the hand-lever and having a tooth adapted to engage the recesses of the gage-plate, another lever fulcrumed on the carriage, and provided with a tooth adapted to engage the recesses of the gage-plate, a flexible connection between the last-named lever and one arm of the hand-lever, whereby as the hand-lever is manipulated, the operation of the carriage-actuating parts is substantially as described, and suitable means for supporting the toothed arm and the toothed lever, above the gage-plate whereby the carriage may be moved at will on the track.

14. In a saw-sharpener, the combination with a saw-holder and a carriage-track, of a file-holder carriage mounted to move longitudinally on the track, means for regulating the movement of the carriage on the track, comprising a plate mounted to have a vertical movement on the carriage, springs attached to said plate and bearing on the track, and a set-screw for adjusting the plate vertically whereby the springs may be made to bear against the track with more or less tension as desired.

15. In a saw-sharpener, the combination with a saw-holder and a carriage-track, of a file-holder carriage having notches engaging the track whereby the carriage is held in place, and a tension device mounted on the carriage and engaging the track for controlling its sliding movement.

16. The combination with a saw-holder and a track, of a carriage movably mounted on the track and provided with sockets, guides provided with vertical lower portions adapted to enter said sockets, and slotted upper portions forming oblique angles with the vertical lower portions, and a file-holder mounted in the slots of the guides.

17. The combination with a saw-holder and a track, of a carriage movably mounted on the track and provided with two vertical sockets on each side, file-holder guides located in two of said sockets, said guides having vertical lower parts adapted to enter the sockets, and

upper slotted portions inclined to the horizontal, the said guides being detachable to occupy the two other sockets.

18. The combination with a saw-holder and a track, of a carriage movable longitudinally on the track and provided with four vertical sockets, two file-holder guides mounted in two of the carriage-sockets, said guides having vertical lower parts adapted to enter said sockets, and slotted upper parts forming oblique angles with the lower parts, said guides being detachable, a file-holder adapted to engage the slots of the guides, the said file-holder comprising a frame and set - bolts passing therethrough and having eyes at their extremities adapted to receive the file which is tightened by nuts on the bolts.

19. The combination with a saw-holder and a carriage-track, of a file-holder carriage movable on the track and provided with two pairs of sockets, two detachable guides arranged to alternately engage the two pairs of sockets, said guides having U-shaped arms provided with shoulders, and a file-holder comprising a frame having ledges adapted to engage the shoulders of the frame as the file-holder is manipulated.

20. The combination with a saw-holder and carriage - track, of a reversible gage - plate mounted on the track, a carriage movable on the track, and means mounted on the carriage and coöperating with the gage-plate to impart a step-by-step movement to the carriage, said means comprising a hand-lever fulcrumed on the carriage, an arm pivotally connected with the carriage, and a second lever also fulcrumed on the carriage and connected with the hand-lever.

21. The combination with a saw-holder and

a carriage-track, of a gage-plate mounted on the track and provided with two rows of notches or recesses, the notches of the one row being farther apart than those of the other row, whereby the gage-plate becomes reversible to adapt it for use with different saws, a hand-lever fulcrumed on the carriage, an arm pivotally connected with the carriage, and a second lever also fulcrumed on the carriage and connected with the hand-lever, the said pivoted arm and the second lever being arranged to coöperate with the gage-plate to impart a step-by-step movement to the carriage as the hand-lever is operated.

22. The combination with a saw-holder, of a gage-plate adjustably mounted thereon, a screw journaled on the saw-holder and threaded in the gage-plate, for adjusting the latter longitudinally, and a device actuated from the gage-plate to indicate the degree of the latter's movement.

23. The combination with a saw-holder, of a gage-plate adjustably mounted thereon and provided with a lug having a threaded opening, a screw journaled on the saw-holder and engaging the lug of the gage-plate for imparting a longitudinal movement to the latter, a graduated face - plate attached to the saw-holder, and a lever-like pointer located adjacent said face-plate and connected with the gage-plate to actuate the pointer as the gage-plate is moved.

In testimony whereof I affix my signature in presence of two witnesses.

NICOLAUS KALL.

Witnesses:

DORA C. SHICK,
S. S. ABBOTT.