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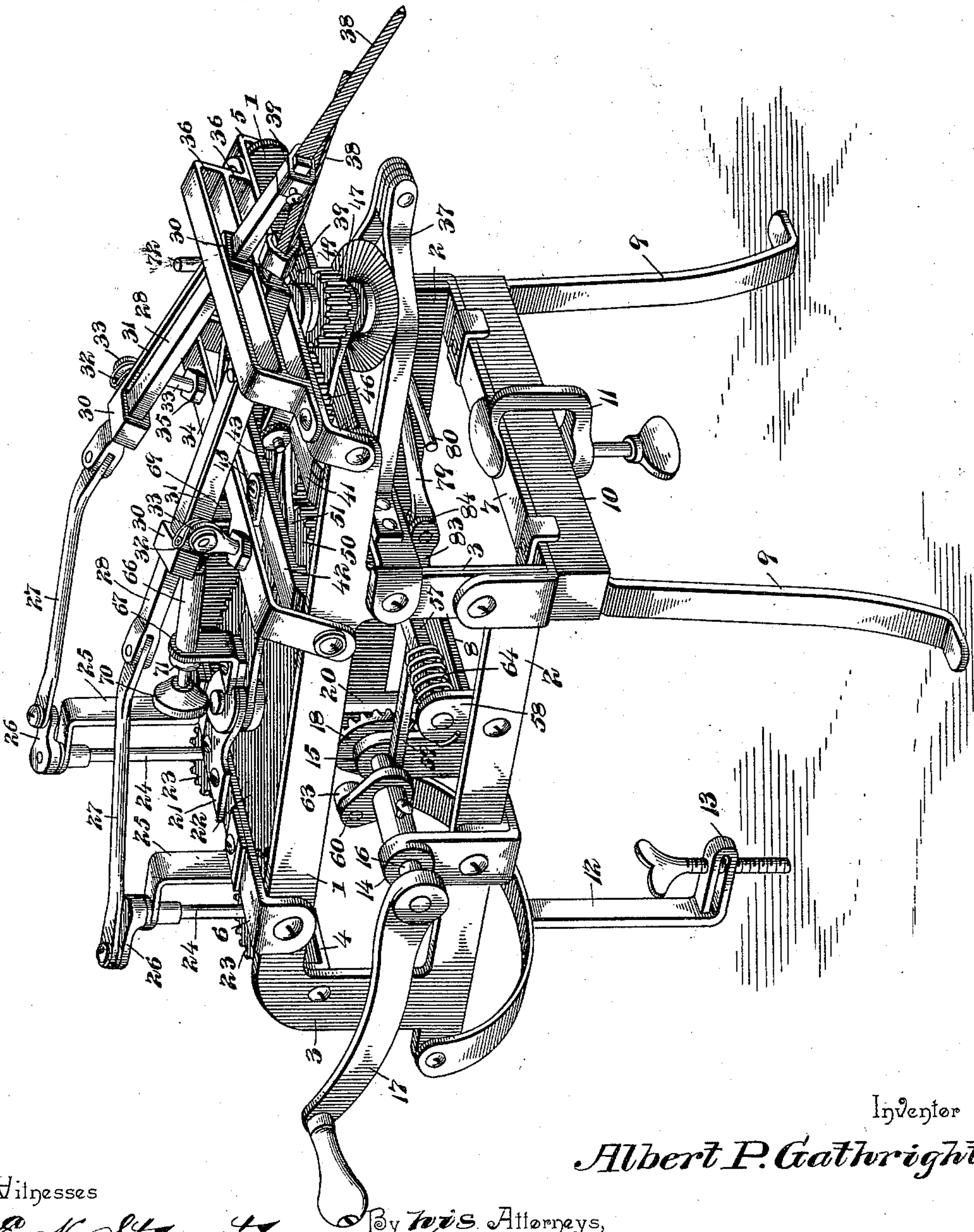
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A. P. GATHRIGHT.
GIN SAW FILER AND GUMMER.

No. 561,580.

Patented June 9, 1896.

Fig. 1.



Inventor

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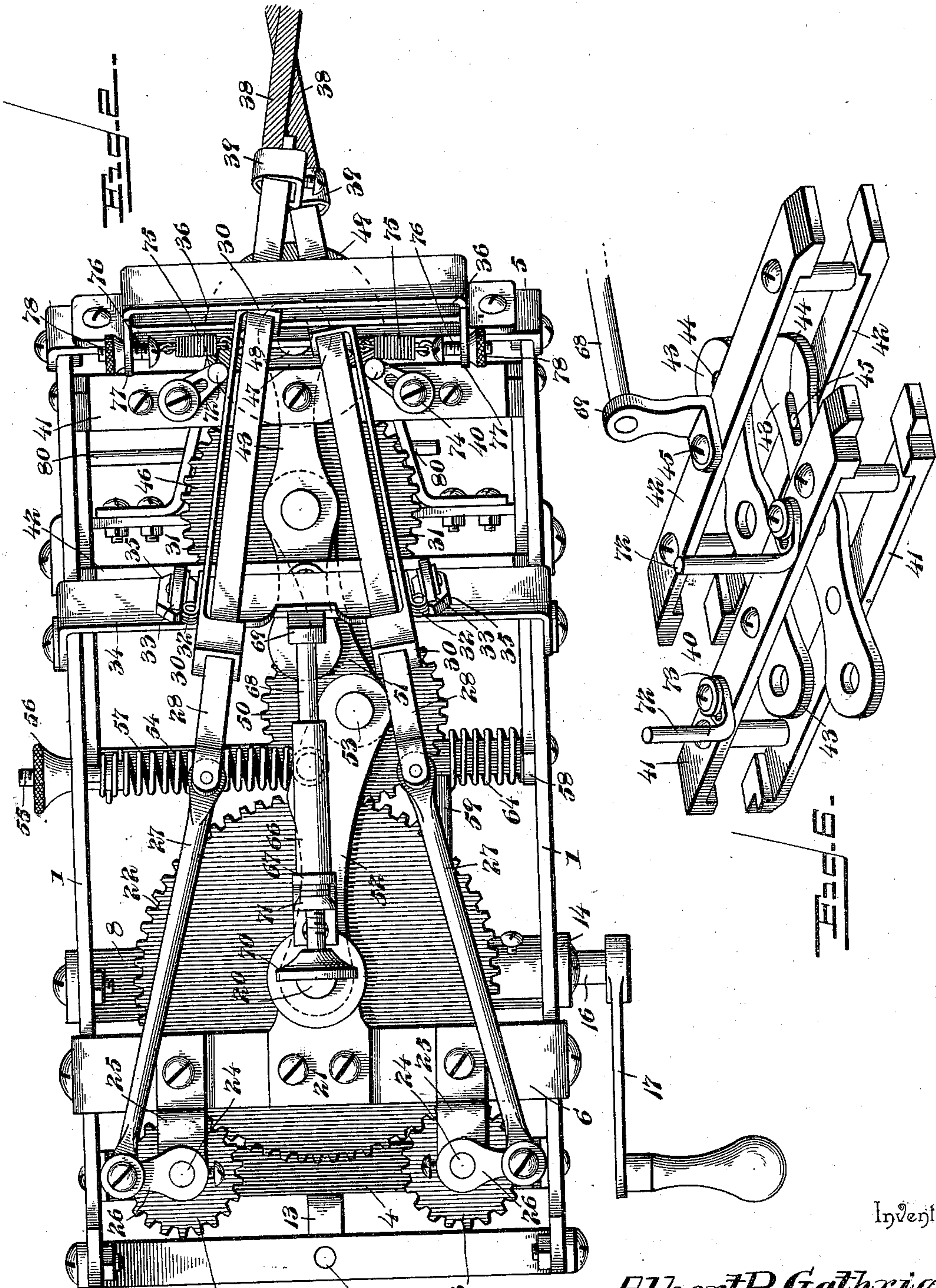
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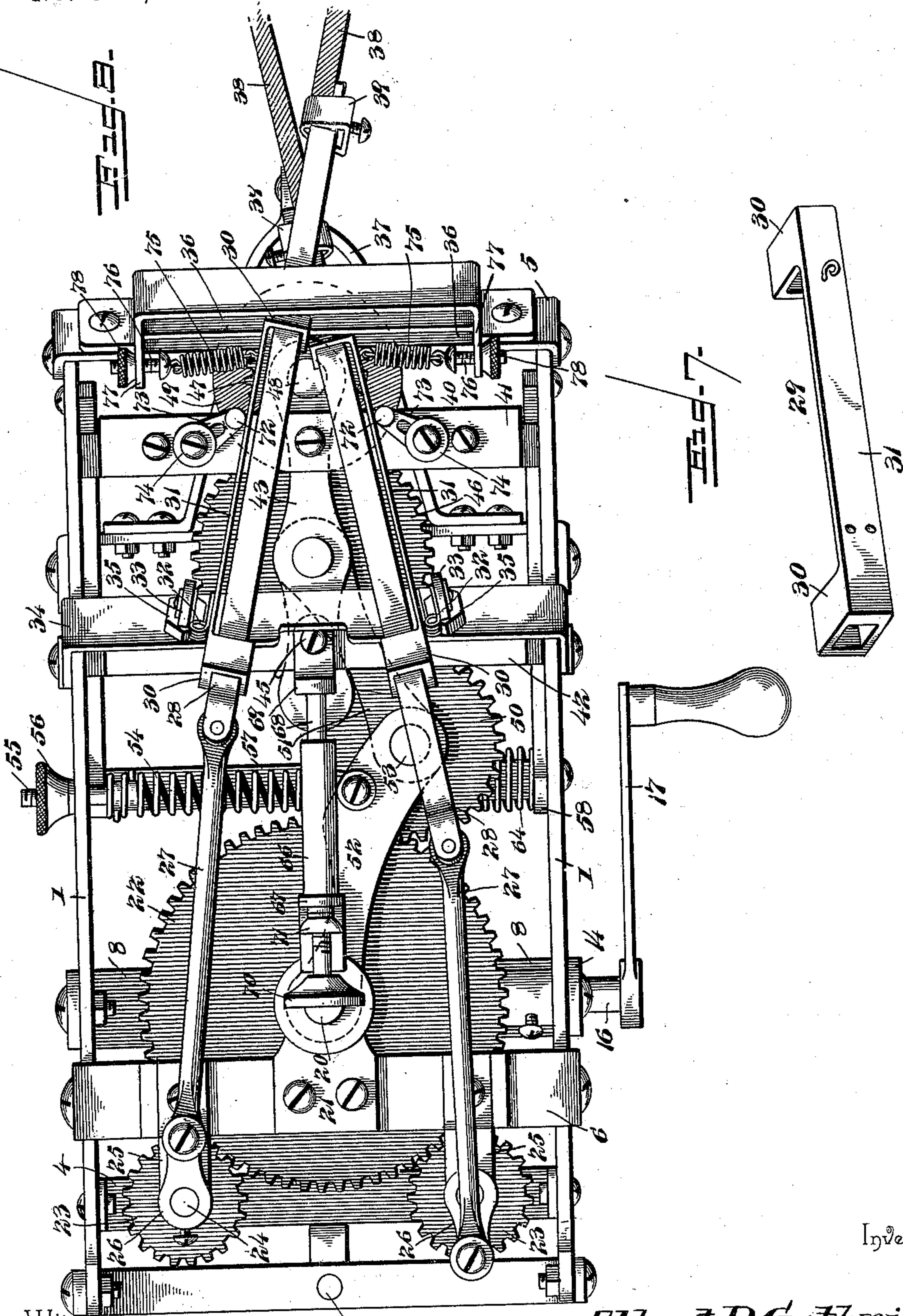
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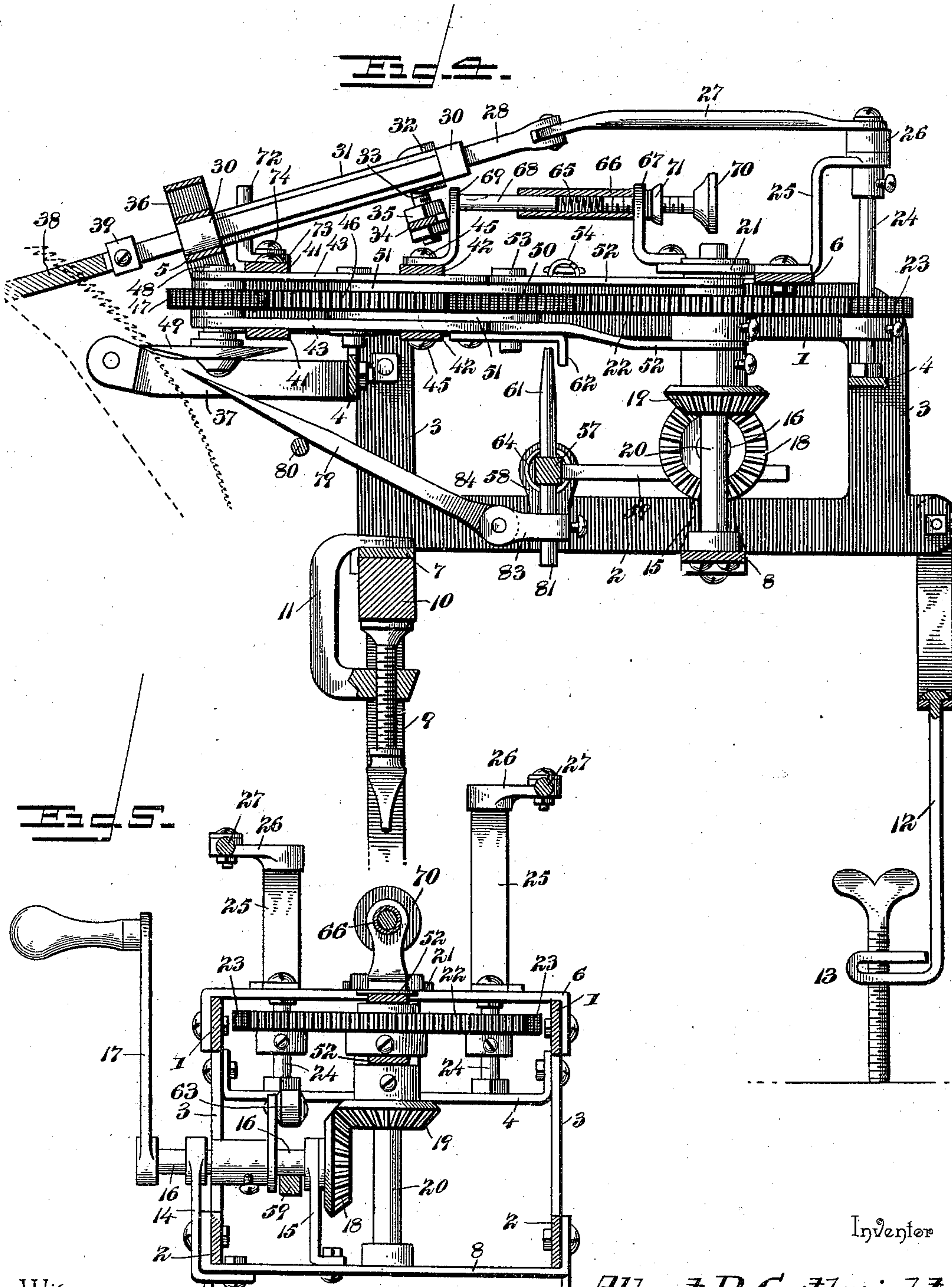
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UNITED STATES PATENT OFFICE.

ALBERT P. GATHRIGHT, OF MERIDIAN, MISSISSIPPI.

GIN-SAW FILER AND GUMMER.

SPECIFICATION forming part of Letters Patent No. 561,580, dated June 9, 1896.

Application filed August 6, 1895. Serial No. 558,394. (No model.)

To all whom it may concern:

Be it known that I, ALBERT P. GATHRIGHT, a citizen of the United States, residing at Meridian, in the county of Lauderdale and State of Mississippi, have invented a new and useful Gin-Saw Filer and Gummer, of which the following is a specification.

My invention relates to saw filing and gumming machines, and has for its object to provide a compact and efficient mechanism having direct means for communicating motion to the reciprocatory and rotary files and for removing the same from contact with the saw-teeth during the feeding of the saw, and, furthermore, to provide suitable means for adjusting the various parts of the mechanism to suit saws of different kinds and having teeth arranged at different intervals and beveled at different angles.

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

In the drawings, Figure 1 is a perspective view of a gin-saw filer and gummer constructed in accordance with my invention. Fig. 2 is a plan view of the same, showing the parts in their normal positions. Fig. 3 is a similar view showing the parts in the positions which they assume during the feeding operation. Fig. 4 is a longitudinal vertical section. Fig. 5 is a transverse section taken parallel with and contiguous to the plane of the driving-shaft. Fig. 6 is a detail view in perspective of the cross-head detached. Fig. 7 is a similar view of one of the file-carrier guides.

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

The frame of the machine embodying my invention is provided with upper and lower side bars 1 and 2, connected by vertical bars 3, which are in turn connected by transverse braces 4, the upper side bars being connected at their front ends by a transverse bar 5 and near their rear ends by a similar bar 6, while the lower side bars are connected by transverse bars 7 and 8, located, respectively, at the front ends and at intermediate points thereof. This frame is supported by means of front standards 9, having a cross-piece 10, which is secured by a clamp 11 to the front

cross bar 7, and a pivotal leg 12, arranged at the rear end of the frame and having an adjustable foot 13, which in the construction illustrated consists of a thumb-screw mounted in an offset portion of the leg. By means of this adjustable foot the frame may be arranged in a horizontal position or at any desired inclination to vary the positions of the operating parts.

Mounted in suitable bearings 14 and 15, supported by the rear cross-bar 8, is a driving-shaft 16, which may be provided with any suitable means for communicating motion thereto—such, for instance, as a crank 17. This driving-shaft is provided with a bevel-gear 18, meshing with a corresponding gear 19 on a vertical driven shaft 20, said driven shaft being mounted at its lower end in a bearing at the center of the cross-bar 8 and at its upper end in a bearing supported by the cross-bar 6, said bearing being formed in a bracket 21, projecting forwardly from the cross-bar. The vertical shaft carries a spur-gear 22, with which mesh pinions 23 on the vertical crank-shafts 24, said crank-shafts being mounted at their lower ends in bearings on the rear cross-bar 4 and at their upper ends in bearings formed in brackets 25, which rise from the cross-bar 6. The shafts are provided with cranks 26 above their upper bearings, and these cranks communicate motion through the pitman 27 to the reciprocatory file-carriers 28.

The file-carriers are mounted for reciprocation in guides 29, each of which consists of terminal eyes or keepers 30, connected by a flat strip or wear-plate 31, and each guide is hinged or pivotally mounted upon the frame to swing at its front end toward and from the longitudinal center of the machine, or toward and from the plane of the saw which is being filed and which is illustrated in the drawings at 32. In the construction illustrated said saw-guides are also adapted for vertical adjustment, and hence are pivotally connected to the upper ends of stems 33, which extend through openings formed in a transverse bracket 34, supported by the frame above the plane of the side bars 1, said stems being engaged above and below the plane of the bracket by lock-nuts 35. The front ends of the file-carrier guides are mounted for lateral

movement in transverse upper and lower ways 36, consisting of parallel upper and lower bars arranged above and supported by the transverse bar 5 and combining therewith to form the said guideways. Thus the front ends of the carrier-guides operate, respectively, in parallel upper and lower planes in their movement toward and from the plane of the saw, said saw being held firmly in place during the filing process by means of a saw-clamp 37, which is supported by the front cross-bar 4. Reciprocatory files 38 are shown attached to the front ends of the file-carriers by means of clamps 39.

Arranged at the inner sides of the upper side bars 1 are tracks upon which is mounted a cross-head 40, having a front member 41, comprising upper and lower transverse bars, a rear member 42, comprising similar upper and lower transverse bars, and longitudinal upper and lower bars 43, connecting said transverse bars at their centers, the rear ends of the longitudinal bars being adjustably connected to the rear member of the carriage by means of slots 44 in the longitudinal bars, which are engaged by bolts 45. Mounted on the cross-head between the planes of the upper and lower longitudinal bars is a spur-wheel 46, meshing with a pinion 47 on the spindle 48 of the rotary or gumming file 49, the spindle of said rotary file being mounted in bearings at the front ends of the longitudinal bars of the cross-head in advance of the front member thereof. Motion is communicated from the spur-wheel on the driven shaft to the spur-wheel on the cross-head by means of an interposed idle spur-wheel 50, which is adapted to travel in a transverse path toward and from the line connecting the axes of said spur-wheels to accommodate the position of the cross-head which is mounted for longitudinal reciprocation, and the means which I employ for maintaining said intermediate or idle spur-wheel in operative relation with the stationary and movable spur-wheels include parallel upper and lower links 51, pivoted at their front ends upon the spindle of the movable spur-wheel, parallel upper and lower rear links 52, pivotally mounted upon their rear ends upon the spindle of the main or stationary spur-wheel, and a pin 53, pivotally connecting the inner or adjacent ends of said links and forming the journal for said intermediate or idle gear. These pivotally connected upper and lower links, which are mounted at their remote extremities upon the spindles of the stationary and movable gears, form toggle-arms, at the inner joints of which is arranged the spindle of the intermediate gear, and these intermediate parts of the toggle-arms are drawn toward the line connecting the axes of the stationary and movable gears to hold the intermediate gear in engagement with said stationary and movable gears by means of a spring 54, connected at one end to one of the upper links and provided at the other end with a threaded stem

55, extending through an opening in the contiguous side bar 1, where it is engaged by a thumb-nut 56. By means of this thumb-nut the tension of the spring may be varied as required by the operation of the mechanism.

Rearward motion is communicated to the cross-head, against the tension of the spring connected to the toggle-arm, by means of a rock-shaft 57, mounted in bearings 58, rising from the side bars 2, an arm 59, carried by the rock-shaft and arranged in the path of a cam 60 on the driving-shaft, and a second arm 61, also carried by the rock-shaft in operative relation with a stud 62 on the rear member of the cross-head. The cam is preferably provided with an antifriction-roll 63, and it engages the contiguous arm of the rock-shaft once for each complete revolution of the driving-shaft, such engagement causing the depression of the arm and the consequent rearward movement of the cross-head to withdraw the rotary file or gummer from contact with the saw-teeth. A return-spring 64 is coiled upon the rock-shaft to return it to its normal position after each depression of the arm which is arranged in the path of the cam. I also employ a return-spring for the cross-head to exert a positive pressure thereon in the direction of its movement, this spring 65 being arranged in a tubular guide or barrel 66, arranged horizontally above the frame and supported by an arm 67, rising from the bracket in which the upper end of the driven shaft is mounted, and a plunger 68, carried by an arm 69 on the rear member of the cross-head, to operate in said tubular guide or barrel and repress the spring when the cross-head moves rearwardly. The tension of this spring is regulated by a thumb-screw 70, operating in the rear end of the tubular guide or barrel and locked at the desired adjustment by means of a jam-nut 71.

From the above description it will be seen that I have provided for reciprocating the file-carriers to cause the files to operate in contact with the beveled edges of the saw-teeth, and that I have also provided means for operating the rotary file or gummer and withdrawing it from contact with the teeth preparatory to feeding the saw, and as it is necessary to remove the reciprocatory files from the saw in order to prevent injury to the teeth I provide the cross-head with limiting-pins 72, secured to the upper bar of the front member and having slotted ears 73, engaged by bolts 74, whereby the pins may be adjusted. These pins are arranged in contact with the connecting or wear plates between the eyes or keepers of the file-carrier guides, whereby when the cross-head is drawn rearwardly by the means above described said pins engage the outer surfaces of the guides and swing them toward each other. This inward movement of the front ends of the guides causes an outward movement of the files, for the reason that the file-carriers intersect each other at a point contiguous to the periphery of the saw. The

saw-guides are held in contact with the inner sides of the limiting-pins by means of small coiled springs 75, which are connected at their outer ends to adjusting-screws 76, extending through brackets 77 and engaged by thumb-nuts 78.

In connection with the above-described mechanism I employ a feeding-pawl 79, which operates at its free end contiguous to the plane of the rotary file or gummer and between the arms of the saw-clamp, and which rests upon a guide-arm 80, extending transversely across the front of the machine below the plane of the saw-clamp. Motion is communicated to the feed-pawl to cause the projection thereof to engage a tooth of the saw when the filing devices are withdrawn from contact therewith by means of an arm 81 on the rock-shaft, and connection is formed between said pawl and the arm by means of an adjustable shoe 83, said shoe being provided with parallel ears 84, between which the extremity of the pawl is pivoted. By means of this shoe the point of connection of the pawl with the arm may be varied to change the throw of the pawl, and hence the extent of movement of the saw for each operation of the pawl. This adjustment is designed to adapt the feeding devices for imparting the necessary movement to saws having teeth of different sizes.

By means of the adjustable foot on the lower end of the pivotal leg supporting the rear end of the frame the rotary file or gummer may be arranged in a position to approach the saw at the desired angle.

From the above description the operation of the mechanism will be understood, and it is obvious that various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

Having described my invention, what I claim is—

1. In a machine of the class described, the combination with a frame, a driving-shaft, a gear mounted in fixed bearings and operatively connected with the driving-shaft, reciprocatory file-carriers, and connections between the file-carriers and said stationary gear, of a cross-head mounted for reciprocatory movement, a movable gear mounted upon the cross-head, a rotary file or gummer carried by the cross-head and operatively connected with said movable gear, an intermediate gear for communicating motion from the stationary to the movable gear, toggle-arms supporting said intermediate gear and mounted at their extremities coaxially with the stationary and movable gears, and means for imparting rearward movement to the cross-head and for maintaining the intermediate gear in engagement with the stationary and movable gears, substantially as specified.

2. In a machine of the class described, the combination with a frame, reciprocatory file-

carriers, feed mechanism, and connections between said parts, of a reciprocatory cross-head, a rotary file or gummer carried by the cross-head, a gear mounted in fixed bearings and operatively connected with the driving-shaft, a movable gear carried by the cross-head, toggle-arms having their outer extremities mounted concentric with the spindles of said stationary and movable gears, an intermediate gear carried by the toggle-arms and meshing with the stationary and movable gears to communicate motion from the former to the latter, means for communicating rearward movement at intervals to the cross-head, a spring connected to the toggle-arms to return the intermediate gear to its normal position, and means for adjusting the tension of said spring, substantially as specified.

3. In a machine of the class described, the combination with a frame, reciprocatory file-carriers, feed mechanism, and connections between said parts, of a reciprocatory cross-head, a rotary file or gummer carried by the cross-head, stationary and movable gears mounted, respectively, upon the framework and cross-head, toggle-arms mounted at their extremities concentric with the spindles in said stationary and movable gears, an intermediate gear meshing with the stationary and movable gears, resilient means for maintaining the intermediate gear in its operative position, a rock-shaft operatively connected with the driving-shaft and adapted to receive intermittent motion therefrom, and an arm on the rock-shaft arranged in operative relation with a projection on the cross-head, substantially as specified.

4. In a machine of the class described, the combination with a frame, reciprocatory file-carriers, feed mechanism, and connections between said parts, of a reciprocatory cross-head, a rotary file or gummer mounted upon the cross-head, means for communicating rotary motion from the driving-shaft to the rotary file or gummer in all positions of the cross-head, a rock-shaft having an arm arranged in the path of a cam on the driving-shaft, connections between the rock-shaft and the cross-head whereby motion is communicated from the former to the latter, and means for returning the parts to their normal positions, substantially as specified.

5. In a machine of the class described, the combination with a frame, reciprocatory file-carriers, feed mechanism, and connections between said parts, of a reciprocatory cross-head, a rotary file or gummer mounted upon the cross-head, connections between the driving-shaft and the rotary file or gummer whereby motion is communicated to the latter in all positions of the cross-head, means for communicating rearward motion to the cross-head at intervals, and means for returning the cross-head to its normal position, the same including a tubular guide or barrel, an expansion-spring arranged therein, a plunger

carried by the cross-head and operating in the tubular guide or barrel, and means for adjusting the tension of the spring, substantially as specified.

- 5 6. The combination with a frame, a driving-shaft, and feeding mechanism operatively connected with the driving-shaft, of reciprocatory file-carriers, connections between the file-carriers and the driving-shaft, file-carrier
10 guides pivoted for swinging movement at their front ends, a reciprocatory cross-head, connections between the cross-head and the driving-shaft whereby intermittent motion is communicated to the former, limiting-pins
15 carried by the cross-head and coöperating with the guides to impart lateral swinging movement thereto, and resilient means for returning the parts to their operative positions, substantially as specified.
- 20 7. The combination with a frame, a driving-shaft, and feeding mechanism operatively connected with the driving-shaft, of pivotal file-carrier guides arranged to swing toward and from each other at their front ends, up-
25 per and lower guideways for said guides, file-carriers mounted in the guides, connections between the file-carriers and the driving-shaft, a reciprocatory cross-head and connections between the same and the driving-
30 shaft, limiting-pins arranged upon the cross-head in operative relation with the pivotal guides and adapted to impart lateral movement thereto, and resilient means for returning said guides to their operative positions, substantially as specified.
- 35 8. The combination with a frame, a driving-

shaft, and feeding mechanism operatively connected with the driving-shaft, of swinging file-carrier guides adapted to be moved toward and from each other at their front ends, file- 40 carriers mounted in said guides and operatively connected with the driving-shaft, limiting-pins carried by the cross-head and arranged in operative relation with the pivotal guides to impart lateral motion thereto, means 45 for adjusting the limiting-pins to vary the extent of motion imparted to said guides, and resilient means for returning the parts to their normal positions, substantially as specified. 50

9. The combination with a frame, a driving-shaft, and feeding mechanism operatively connected with the driving-shaft, of pivotal file-carrier guides, stems supporting the piv- 55 oted ends of said guides, means for adjusting said stems vertically and securing them at the desired adjustment, file-carriers mounted for reciprocation in said guides and operatively connected with the driving-shaft, a re- 60 ciprocatory cross-head operatively connected with the driving-shaft, connections between the cross-head and the guides for imparting a swinging movement to the latter, and re- 65 silient means for returning the parts to their normal positions, substantially as specified.

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

ALBERT P. GATHRIGHT.

Witnesses:

B. V. WHITE,
W. R. PISTOLL.