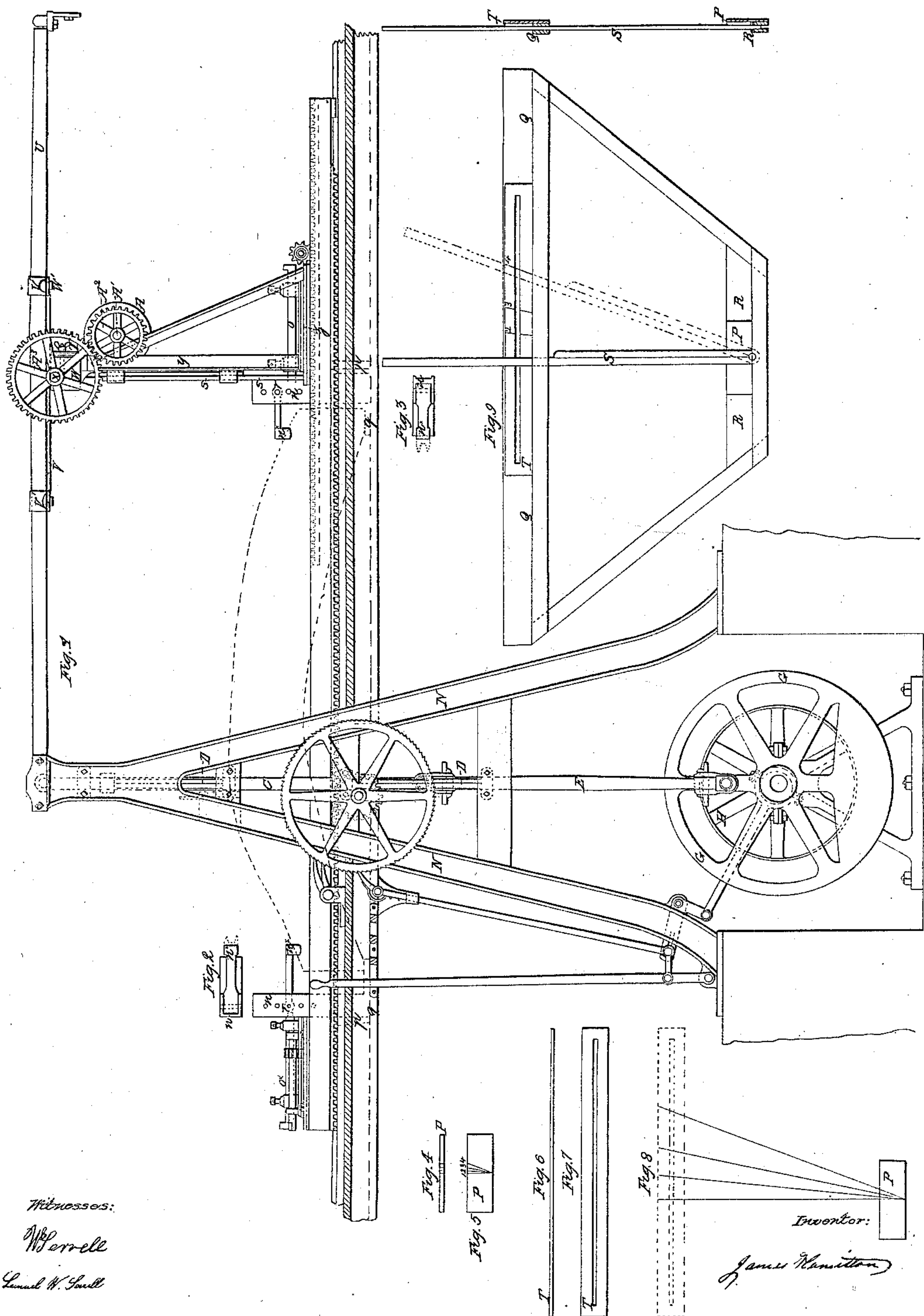


J. Hamilton

Reciprocating Saw Mill,

N<sup>o</sup> 8,872,

Patented Apr. 13, 1852.



Witnesses:  
W. Berrell  
Samuel W. Smith

Inventor:

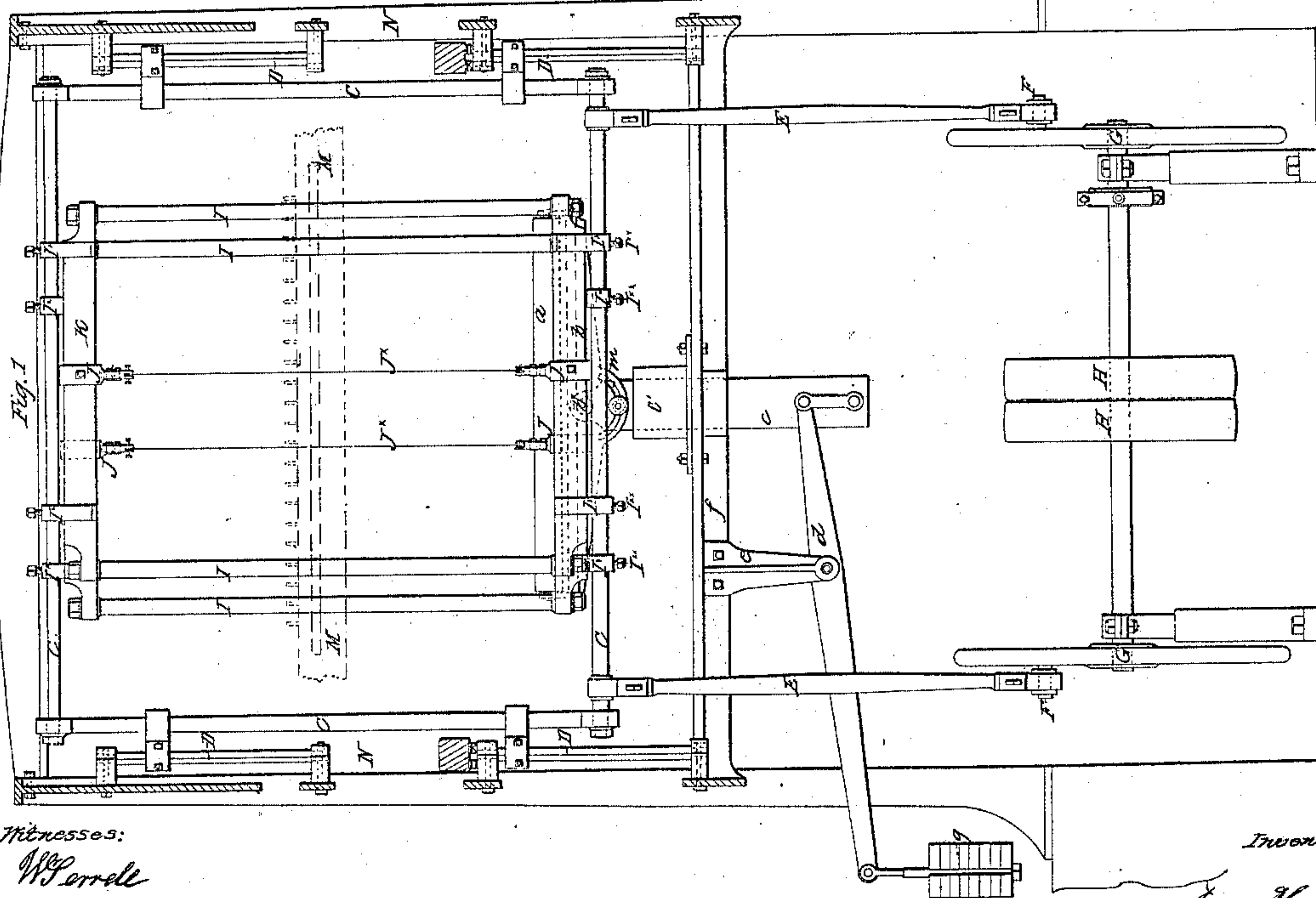
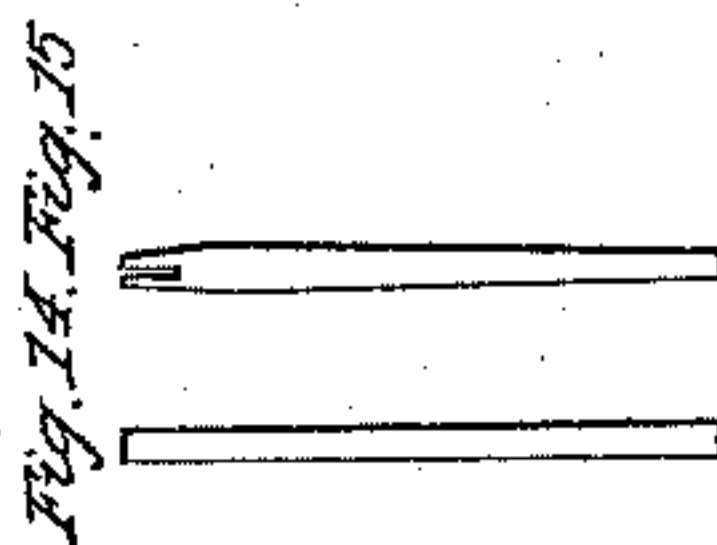
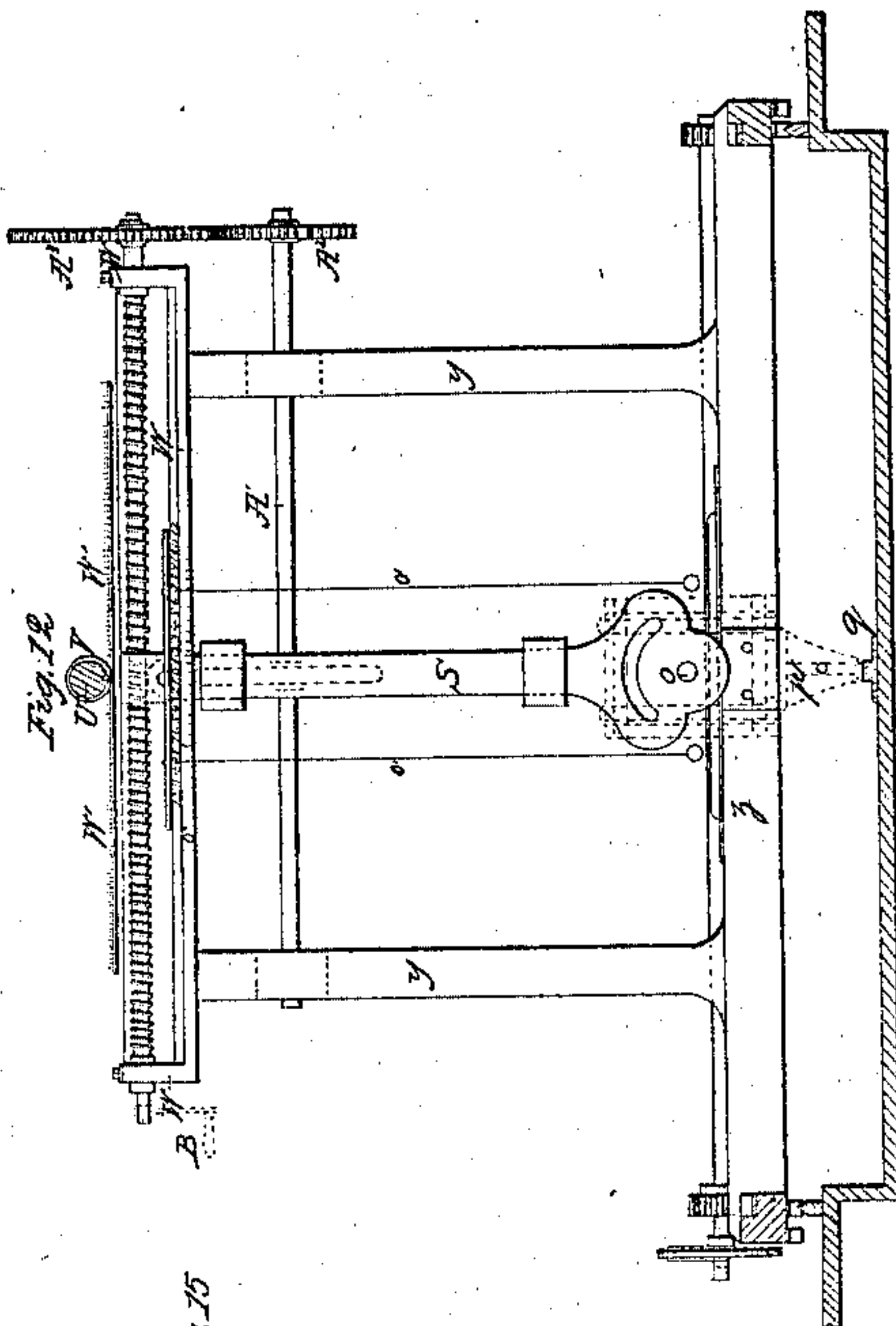
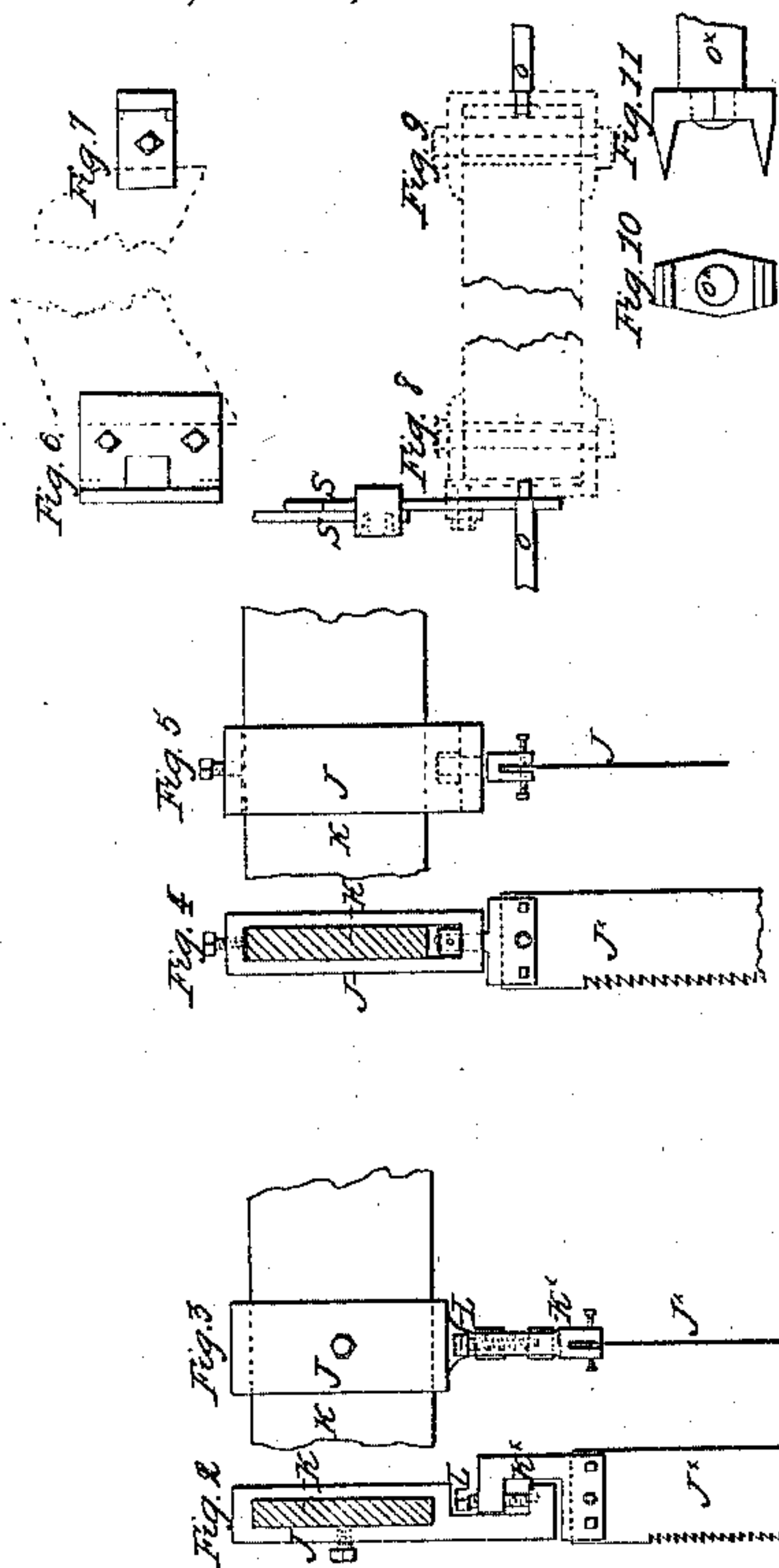
James Hamilton

J. Hamilton

Reciprocating Saw Mill

No. 8,872.

Patented Apr. 13, 1852.



Witnesses:

Wm. Correll  
Lund H. Paul

Inventor:

James Hamilton

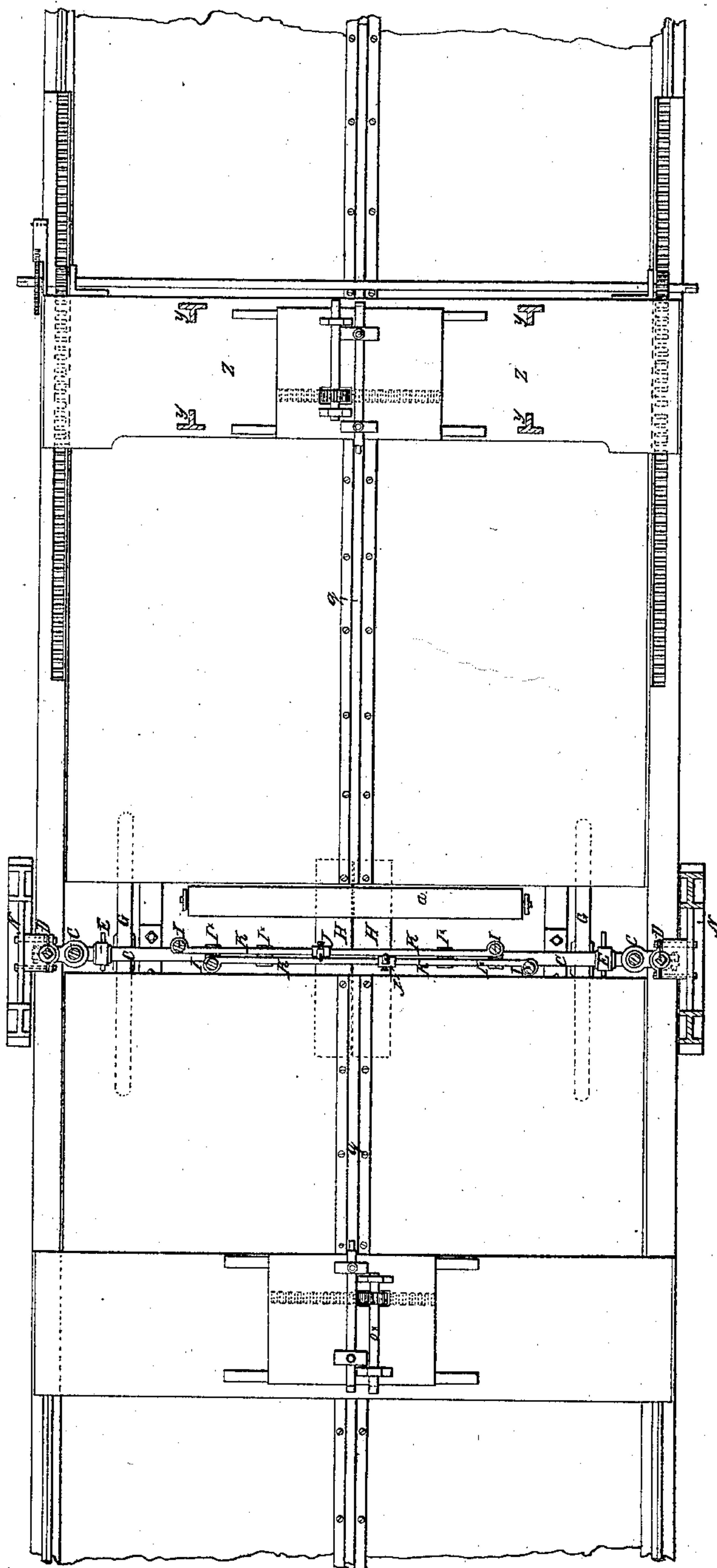
Sheet 3-5 Sheets.

*J. Hamilton,*

## Reciprocating Saw Mill,

N<sup>o</sup> 8,872,

*Patented Apr. 13, 1852.*



*Witnesses:*

Wm. L. L. L.  
Linnell H. Linnell

*Inventor:*

James Hamilton

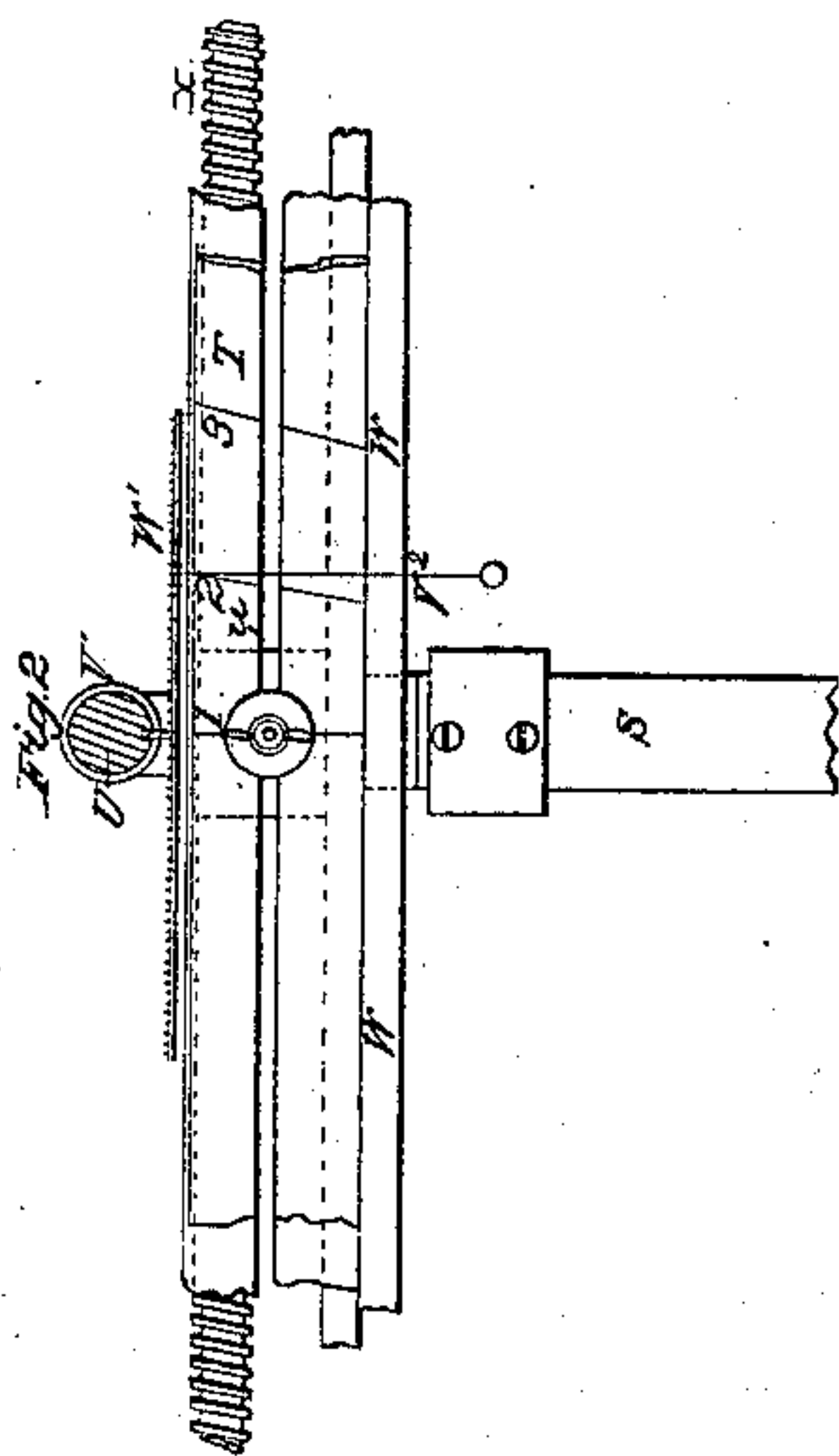
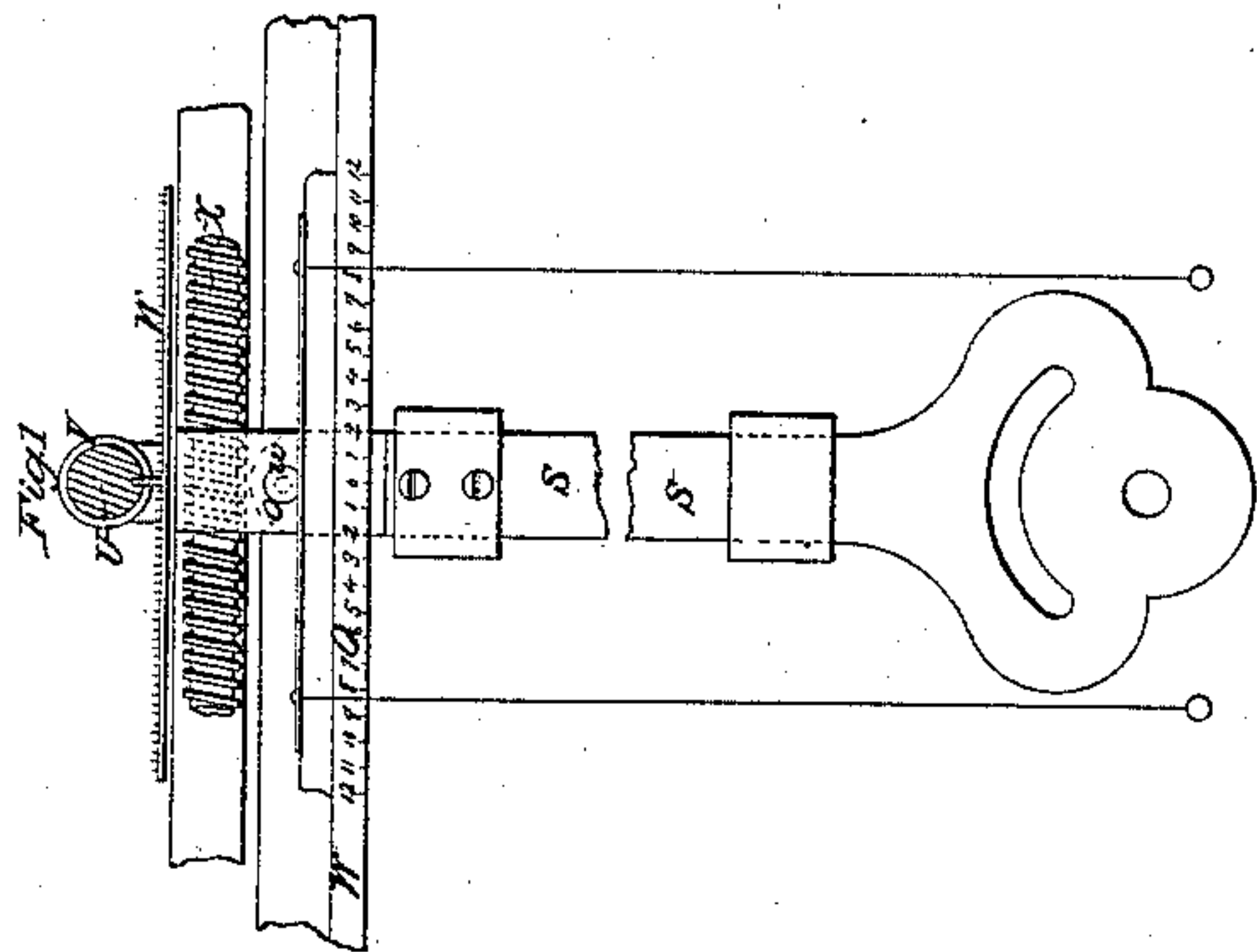
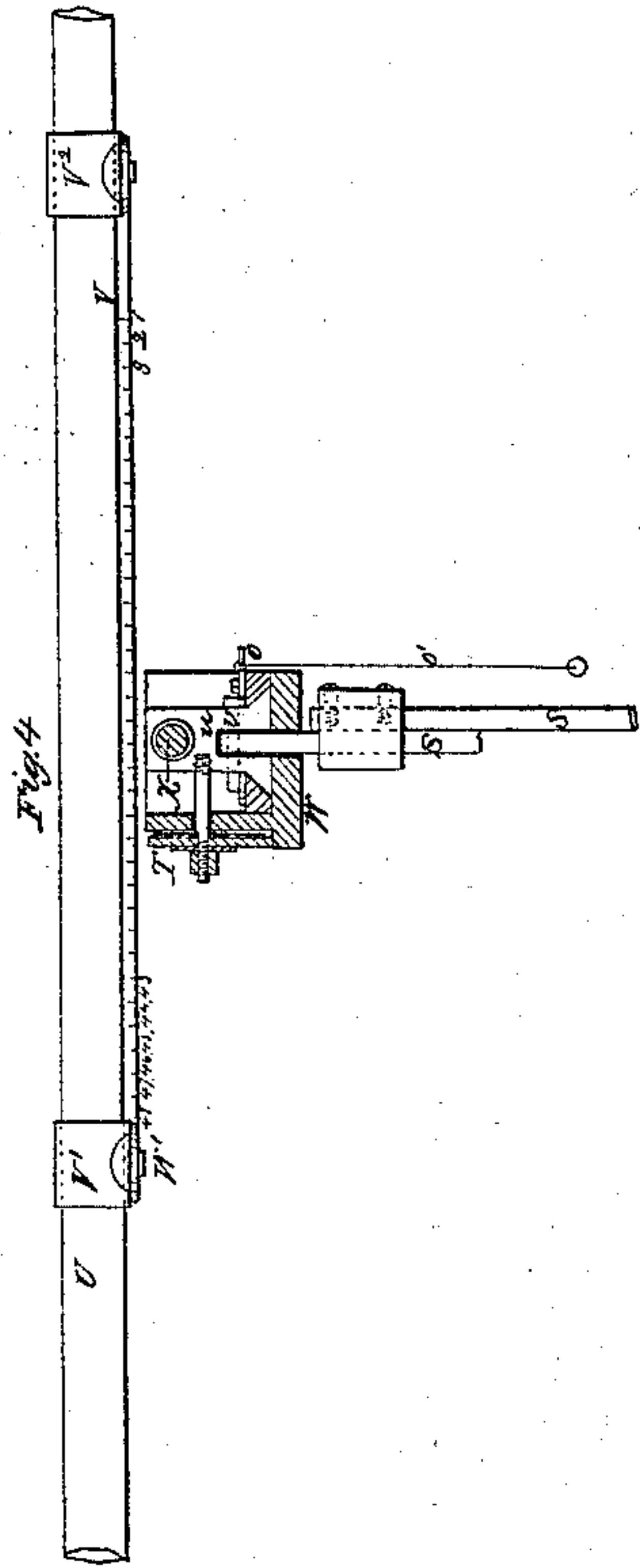
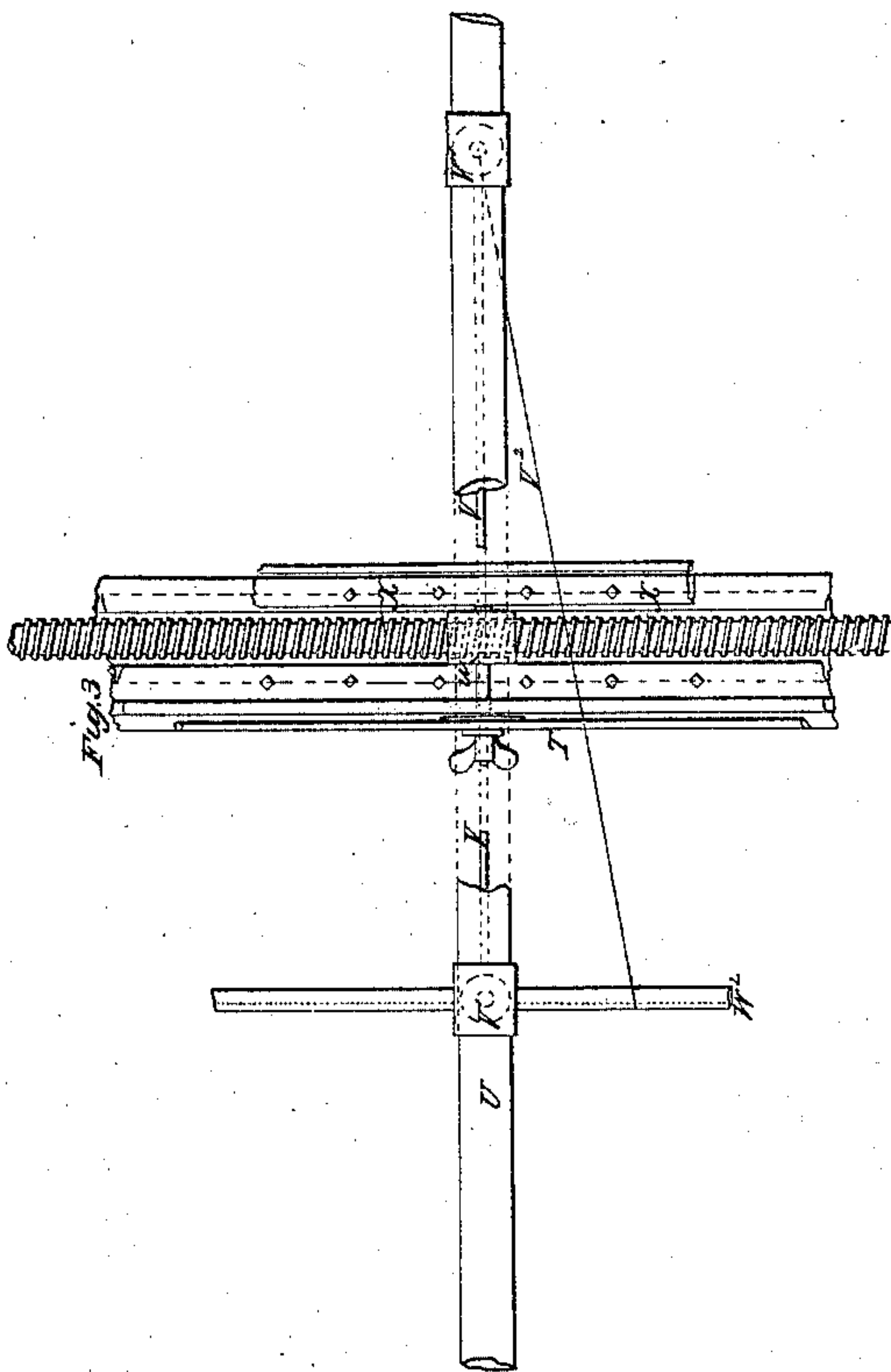


J. Hamilton.

Reciprocating Saw-Mill.

N<sup>o</sup> 8,872.

Patented Apr. 13, 1852.



Witnesses:

W. L. L. L.

Samuel H. Smith

Inventor:

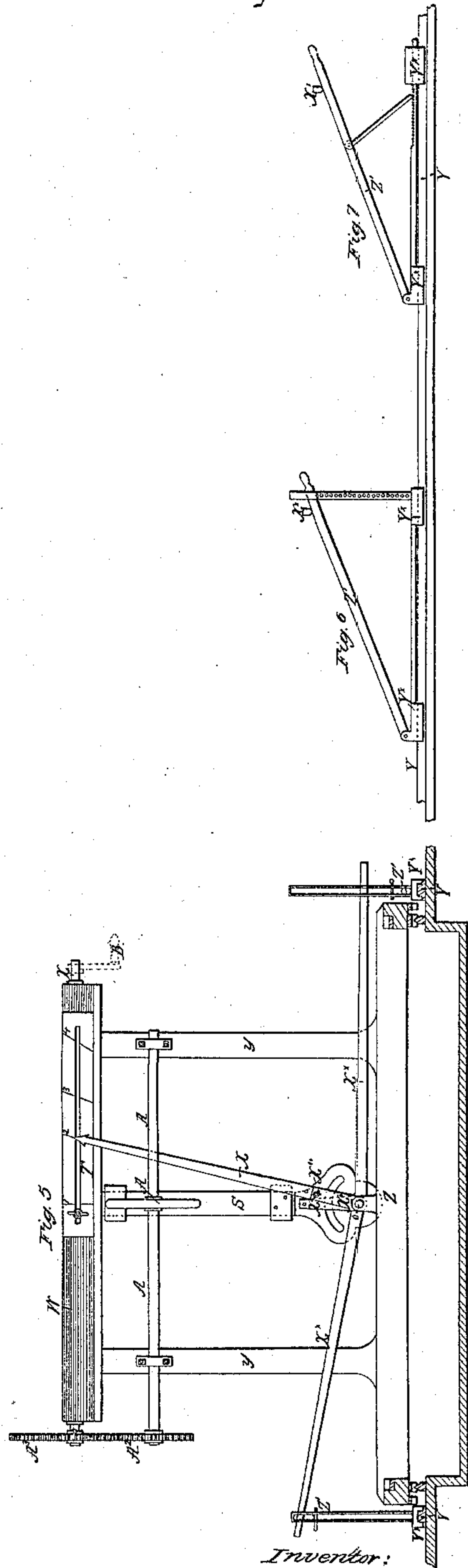
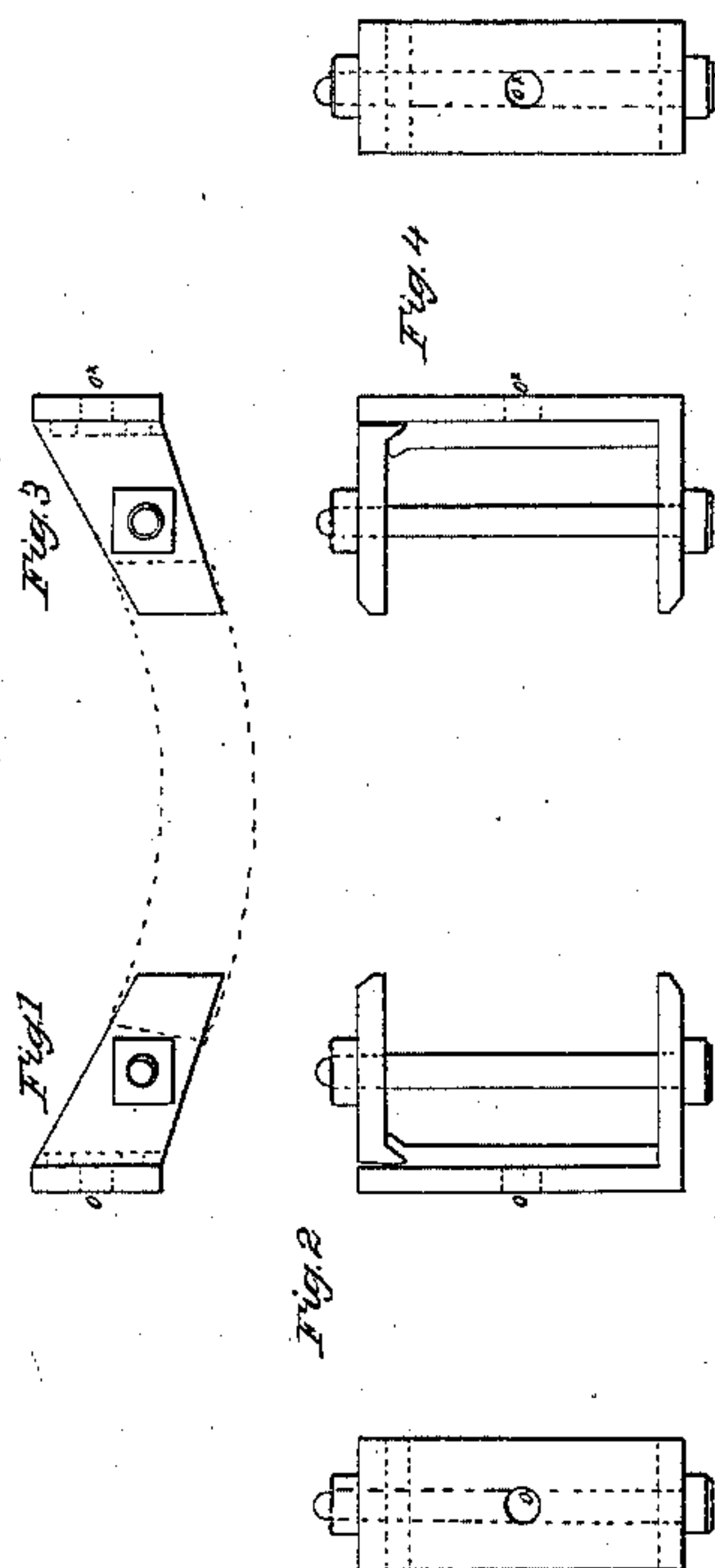
James Hamilton

J. Hamilton,

Reciprocating Saw Mill,

N<sup>o</sup> 8,872.

Patented Apr. 13, 1852.



Witnesses:  
W. Pennell  
Samuel W. Small.

Inventor:  
James Hamilton



# UNITED STATES PATENT OFFICE.

JAMES HAMILTON, OF NEW YORK, N. Y.

## MILL FOR CURVILINEAR SAWING.

Specification of Letters Patent No. 8,872, dated April 13, 1852.

*To all whom it may concern:*

Be it known that I, JAMES HAMILTON, of the city and State of New York, have invented new and useful Improvements in Machinery for Sawing Wood, applicable to various useful purposes, more particularly to the sawing of ship-timbers, &c.

The nature of the said invention, and the manner in which the same is to be performed, are fully described and ascertained, in and by the following statement thereof, reference being had to the drawings hereunto annexed, and to the figures and letters of reference thereon.

The invention consists, first, of means of supporting timber, when being cut to various bevels.

Secondly. The invention consists of chucks, or apparatus, for holding timber at the ends, when being cut or sided, and in supporting such chucks.

Lastly, the invention consists of improvements in apparatus, for indicating the directions, or bevels, to which timber is to be cut. And in order that the invention may be more fully understood, and readily carried into effect, and to enable others to make and use my invention I will proceed to describe the means used by me, reference being had to the drawings hereunto annexed which show so much of sawing machinery, as will enable a workman readily to understand the same, aided by the following description.

The present are not new inventions, but are additions to, and improvements on the machinery for sawing, for which Letters Patent were granted to me in the United States, in the years 1842, and 1843. And it will only be desirable to remark, that I do not confine myself to the precise details shown and described, so long as the peculiar character of either part of the present invention be retained; and I would state, that I do not now claim the mounting of a log of timber on axes, and causing it to be cut by a saw, or saws, moving on axes, and mounted in inner saw gates, or frames moving laterally, freely in an outer gate, such general arrangement of machinery being fully described under my former patent.

Sheet 1, shows a side view of the machine. Sheet 2, is a cross section, behind the saws, also views of separate parts, referred to hereafter. Sheet 3, is a plan of parts of the machine. Sheet 4, shows a mode of beveling.

Sheet 5, shows a variation in the mode of beveling.

In these sheets and figures, the same letters and marks of reference are used, to indicate similar parts in all the sheets and figures.

The first part of the invention consists of a mode of giving support to the timber, near the saw, in cases where such support is required; but in practice, I have not found such support generally required; the holding it by dogs, at either end, being generally sufficient; and it is only in cases where the timber is light, and springy, or of a considerable bend that such support becomes necessary.

Sheet 2, Fig. 1, *a*, is a roller, the axes or necks of which are carried by a frame *b*, such frame being carried by a bar *c*, which at its lower end, is supported by a lever *d*. This lever is supported by a hanging bracket *e*, the bar *c*, is kept upright, by passing through the beam *f*, and slide box *c*<sup>1</sup>, which is fixed on the beam *f*, to give extent of guiding surface to the bar *c*. By this means the roller will be supported in its center, and offer support to the timber moving over it; and in order that the supporting roller *a*, may be enabled to give way, according as the timber is turned on its axes in cutting bevels, I apply weights *g*, to the lever *d*, sufficient to sustain the downward pressure of the log. The roller *a* may be raised, or lowered, by any competent means acting on the lever *d*.

The frame *b*, is made to vibrate or oscillate on the pin *b*<sup>x</sup>, Fig. 1, Sheet 2, and can be fixed at any angle, by means of the set screw *l*, which runs through the quadrant slots *m*, in the sides of the frame *b*.

The angle at which the roller *a*, must be set must be always such, as will bring it properly in contact with the log being sawed.

The second part of the invention consists of an improved form of chuck, for holding the ends of timber when being sided. This apparatus is shown in sheet 1, Figs. 1, 2, and 3, *n*, *n*, are the holding chucks, on which the ends of the timber rest. these chucks are placed on the axes *o*, *o*<sup>x</sup>, of the head blocks, and are made fast, by means of screws passing into the sliding supports *p*, *p*, affixed under the centers *o*, *o*<sup>x</sup>, on the side of the head blocks; the lower



ends of these supports  $p, p$ , and the under sides of the chucks  $n, n$ , rest on, and are sustained by, the center bar  $q$ , and slide upon it, as the log progresses while being cut; the chucks  $n, n$ , carry holding dogs  $n^x, n^x$ , shown in plan in Figs. 2 and 3, moving on axes  $r, r$ , and the log is securely held in position, by driving the outer ends of the dogs  $n^x, n^x$ , into the log, to retain it while two slabs are sawed off, one on either side, or what is termed "siding" the log.

The means for moving the log, while being sawed to the desired bevel, is as follows: The timber is mounted on the axes  $o, o^x$ , by suitable dogs or chucks. I prefer, in most cases, the clamping chucks, or dogs, shown in plan in Sheet 2, Figs. 6 and 7, or the chuck Figs. 10 and 11, may be used; or these dogs may be varied, to suit particular cases, two variations are shown in plan, in Figs. 1, and 3 Sheet 5, acting diagonally on other than the center line, to allow the saw to be entered diagonally, or to finish the cut in the same manner.

Figs. 2, and 4, Sheet 5, show elevations of clamping chucks, or dogs, which may be used when required; these being the means of securing the timber, the rotation or motion of it, is effected by the following means.

Sheet 2, Figs. 8, and 9, represent chucks, with timber in dotted lines, also a bar  $s$ , which at its lower end, has a plate formed thereon, with holes, or a quadrant slot through it, see Fig. 12, the bar  $s$ , being fitted to move freely on the axis  $a$ , and capable of being attached to the chuck, or dog by a screw  $t$ , Fig. 8, passing through the slot or holes in the plate, on the lower end of the bar  $s$ . The bar  $s$ , is made in two parts, with a slide on each, taking the other, and so combined, as to slide and expand or contract in length, as shown by the drawing.

On the upper end of the bar  $s$ , Sheet 2, Fig. 12, is formed a screw socket  $u$ , which is connected to the bar  $s$ , by a pin joint, or axis  $v$ , the underside of the screw socket having dovetails, which move in fixed guides on the bar  $W$ , see Fig. 4, Sheet 4, or the socket  $u$  may be guided by any competent means; the lower part of the bar  $W$ , is slotted, to allow the bar  $s$ , to move freely from side to side of the machine.  $X$  is a screw, supported in bearings on the ends of the bar  $W$ ; this bar  $W$ , is mounted on standards  $y, y$ , the lower ends of which are bolted firmly to the head block  $z$ . It will now be seen, that according as the screw  $X$ , is turned in one direction, or the other, so will be the direction, in which the bar  $s$ , is moved on the axis, with the log of timber fixed thereto. Motion is given to the screw  $X$ , by means of the hand wheel  $A$ , Fig. 12, Sheet 2, and Fig. 5, Sheet 5, fixed on the

axis  $A'$ , on which there is a cogwheel  $A^2$ , which takes into the cog wheel  $A^3$ , on the axis of the screw  $X$ , and in order to give a quicker motion to the screw  $X$ , when it is desired to run the bar  $s$ , back a crank handle  $B$ , is applied to the end of the screw  $X$ ; by this arrangement, the workman will be able to turn the log on the axes  $o, o^x$ , with facility; and by the application of what I call a bevel, or index board, as hereafter explained, he will be able to do so, according to such board, and cause the log to turn in such a manner, as to have the desired bevel or bevels cut by the saw or saws.

I would state, in respect to this part of the invention, that the peculiar character consists in the mode of applying a screw  $X$  to the bars  $s$ . I would, however, remark, that I do not claim the use of the screw and socket generally for this purpose, as a mode of using a screw and socket was described, in one of my patents before referred to; but in that case, the screw gave motion to a lever, that acted on a bar that rotated the log.

In my patent of 1843, before referred to, one or two saws were proposed to be used, they were to be both in the same frame. I now use two inner saw gates, moving independently of each other, and each gate carries one or more saws. The arrangement of these saws and gates is shown in elevation in Fig. 1, Sheet 2, and Sheet 3, shows the saws and gates in plan.  $C, C$ , is the outer gate, moving up and down on the guides  $D, D$ , (formed in any convenient manner) by pitmen  $E, E$ , the upper ends being connected to the outer gate  $C$ , and their lower ends to the crank pins  $F, F$ , on the fly wheels  $G, G$ , which fly wheels are driven by the fast and loose pulleys  $H, H$ , by power communicated in the usual way.  $I, I, I, I$ , are the two inner gates, sliding independently of each other, and on opposite sides of the top and bottom rails of the outer gate. The inner gates are connected with the outer gate, by gromtes  $I^x, I^x$ , which slide on the outer gate freely, enabling the attendant workman to follow different curves, or lines, which may be marked on the surface of the log.  $J, J$ , are the four buckles on each two inner gates  $I, I$ , and may be moved to the right, or left, or either, as occasion requires. These buckles are more clearly shown in Sheet 2, Figs. 2 and 3, and it will be seen, that when the saws are stretched in their respective frames that the teeth of each saw will be in line, and commence sawing at the same time. Sheet 2, Fig. 2, is a side view of the buckle, and Fig. 3, is a front view.  $J$ , is the buckle, and can be slid on the top and bottom  $K$ , of the inner saw gate, or secured in place by means of a set screw. The saw  $J^x$  is connected with the part  $K^x$  of the buckle and



strained by the screw L, which has a steel point on which the saw may be turned as a center in the buckle J, which is hollowed out to receive it; each saw has two buckles of the same description, one at the top and the other at bottom; the saws, as shown and described are capable of turning freely on the centers L, enabling the workman, by the aid of the forked levers Figs. 14, and 15, Sheet 2, (described in my patents before referred to,) acting on the backs of the saws, such instruments being supported in the slotted bar M, see red lines in Fig. 1, Sheet 2. The ends of said bar M, are extended and attached to the fender posts N, N. Figs. 4 and 5, Sheet 2, show another mode of hanging the saws to allow of their being turned.

Sheet 2, Fig. 12., which is a view of the back head block, and Fig. 13., which is a view of the front head blocks. *p, p*, are sliding supports, fixed under the head blocks, to support them, these supports rest and slide on the rail or bar, *q, q*, fixed below, and it is by the use of these sliding projections or supports, *p, p*, together with the rails *q, q*, that the head blocks are made more stable.

In order to indicate where the cuts are to be made, when siding a log, there are index plates fixed, one on the front of the slide box *w*., Sheet 2, Fig. 12, and Sheet 4, Figs. 1 and 4, on the back head block *z*, the other on the cross tie bar M between the frames N., in front of the saw gate; O', is an index plate, with a slot, so as to allow of two plumb lines *o', o'*, as shown; each line having a button on its upper end, which can slide along the slot in the index plate, and the index plates are graduated on each side of their centers, the center being marked *o*., the number, in inches, commencing from their centers, which are over the centers or axes *o, o\** of the dogs, or chucks, on which the timber is mounted; the same arrangement is made, on the index plate placed in front of the saws, as in the one just described, the timber being dogged in the center of the machine, and the lines being set in their proper places to the right and left; showing the thickness of the slab to be taken off; then the saws are set, and made fast, by the set screws *I<sup>x</sup> I<sup>x</sup>*, and prevented from moving laterally, and compelled to go in the direction the lines indicated as in straight sawing, in common saw mills, but if the timber is not to be "sided" straight the screws *I<sup>x</sup>*, are to be slackened, and the saws guided as with curved sawing.

I will now describe the mode of laying out various bevels required to be sawed, and the means used, to indicate these bevels to the workman, so that he can move the log, by the screw X, and cut the bevels as desired.

In order to lay out the bevels to which

the log is to be cut, on one or both sides, I use a board P., Sheet 1, Figs. 4, and 5., on which the workman marks the successive bevels to be cut on a log, by means of a bevel square, as indicated by the lines on the small board P., there being as many bevel lines marked on the board P., as there are different bevels to be cut in the log itself; and I mark out the distances, on the log itself, between each successive bevel; thus supposing that the log was to lie with its underside horizontal, and the saw or saws to commence at right angles thereto, the log would be fixed in the chucks or dogs to that position, and the bar S, Sheet 1., Fig. 1., would be vertical; then supposing, that in making a cut for three feet, it be required to arrive at a certain angle, or bevel, that angle, or bevel, would be marked on the board P., and numbered 2.; then supposing that it be desired, that at this point the bevels were to be varied, and to a certain other angle, by the time the saw or saws arrived at a second determined point on the log, such second angle would be marked on the board P., and numbered 3, and so on. This board P., is then to be placed in the instrument, Sheet 1., Fig. 9., which has two parallel edges Q, and R., and a bar or rule S, on an axis in line with the apex of the angles on the board P. A board T, with a slot therein (see also Figs. 6, 7, and 8, Sheet 1,) is to be fixed on this frame, on the upper edge Q., so that the angles may be transferred from the board P., on to the board T, by means of the rule S.; then the board T, is to be fixed to the upper end of the bar S., as shown in Sheet 4, Figs. 2, 3, and 4, by a screw and nut securing the board T, by means of its slot, to the socket or nut *u*., so that the board T., moves with the bar S., as that is moved by the screw X.; the mark No. 1, being on the center line of the machine, and under the bar V, next to be described.

In Sheet 4, Figs. 1, 2, 3, and 4, U, is the beveling bar described in my former patent, which is to be fixed above the centers of the machine, vertical over the center of the axes *o, o\**. In this bar there is a groove, or other suitable means, to guide the bar V, allowing it to slide freely without rotating, the bar V., being sustained by straps V', around the bar U. The bar V., is graduated into feet, inches, and parts of inches, commencing with the right hand end of the machine, the numbering running back toward the left hand end. The cord or line V<sup>2</sup>, is weighted at one end, and fastened by the other end to the right hand end of the bar V. At the left hand end of the bar V., is fixed a bar W., at right angles to it, with numerous pins, between which the cord V<sup>2</sup>, can be placed. The bar V., is now slid forward, beyond the board T. (which is attached to, and moves with the bar S, as be-



fore described,) a distance, equal to that on the log from its end, to where the change of bevel is to commence; that is, in departing from No. 1., Fig. 2, Sheet 4, and proceeding the desired distance to arrive at the bevel No. 2. The cord is now so placed over the bar  $W'$ , that it is over the mark No. 2, on the bevel board T. The sawing now being made to commence, as the head blocks are drawn along with the log, the cord  $V^2$ , being stationary, the workman, by turning the screw X., causes the mark No. 2, on the board T., to continue under the cord  $V^2$ , until the mark No. 2, arrives to the central line of the machine, under the end of the cord  $V^2$ , which is the termination of the bevel from No. 1, to 2. He then will slide the bar V, a distance equal to that between the second and third bevels, as marked on the log, he will then alter the cord, to coincide with the mark No. 3, on the bevel board T., and then cause the mark No. 3, to continue under the line or cord  $V^2$ , until it arrives at the central line, and so on, until the whole of the desired bevels are cut.

The novelty of the apparatus for showing where the siding is to be made on the log, is in the use of the plumb lines and fixed index plates, to set the log and the saws, and the novelty of this last described apparatus, is in the use of the boards, P., and T., and the mode of transferring the bevels from one to the other, and in the mode of indicating the bevels, by the cord and pins, or their equivalents, as the head block moves along with the log, and the bar S., and index board T, are moved by the screw X., so as to keep the marks on the board T., successively under the cord  $V^2$ , as described.

In Sheet 5, Figs. 5, 6, and 7, is shown a variation in the above mode of forming bevels; Fig. 5, shows a back elevation of the head block, and parts, without the bar U., and indicator V., shown in Figs. 3 and 4, Sheet 4. In place of these parts, two levers  $X^*$ ,  $X^*$ , are fitted on the center o., so that one lies horizontally to the right, and one to the left of the machine when not in use, and each is fitted with an elbow  $X^o$ , and screw by which either can be attached to the index pointer  $X'$ , so as to move with it, on the center o. At Y., is a guide bar, on each of the sills that support the carriage and head block, reaching to the frames N., to receive guide slides  $Y^*$ , with a bar between them, that is jointed at the forward end to a lever  $z'$ , and one of these, on each side the head block, underlies the ends of the levers  $X^*$ , and either one, required to be used, is elevated as shown in Figs. 6 and 7, by pins in a long slot, or by a click and ratchet; so that either lever  $X^*$  slides down it, as the sawing progresses. The index  $X'$ , may be made in two parts, sliding one in the other, so that the point shall always reach the top of the board

T., and on commencing the adjustments, the index  $X'$  is always to be vertical, being at right angles to whichever of the levers  $X^*$ , it is attached to, and at the commencement of the work, the levers  $z'$ , Figs. 6, and 7, is to be placed by sliding on the bar Y., a distance from the lever  $X^*$ , to the joint equal to that which is marked on the log, from the first to the second bevel, then to be cut. The lever  $z'$ , is then to be raised, elevating the lever  $X^*$ , until the pointer  $X'$ , reaches the point No. 2., as shown on Fig. 5., and the parts are then properly adjusted, to indicate the bevel required to be cut in that length. It will be understood, by this description of these parts, that when the work is commenced with the index  $X'$ , Fig. 5, at No. 2, on the index board the lever  $X^*$ , to the left, is elevated on the diagonally placed bar  $z'$ , Figs. 6, or 7, and the workman keeps the screws X, and socket u., in motion, to carry the board to the left, with the bar S, rolling the chuck and log, until the index  $X'$ , comes to the perpendicular line, the point 2, being kept opposite the point of the index, which will have brought the log to the point of the termination of the first bevel, when the parts are to be reset, to produce the next bevel, and so on, in succession; this apparatus operating to indicate the bevels, in a similar manner to the cord  $V^2$ , and either may be used, as most convenient in particular positions.

I have not thought it necessary to describe, minutely, the means of giving motion to the saw gate, nor the action of the feeding apparatus, to move the log up to the saw, they forming no part of the invention; neither have I thought it needful to show all the details of the parts which are not new, some of them being set forth in my previous patents.

What I claim as my invention and desire to secure by Letters Patent, is—

1. Connecting the supporting roller (a) with the lever which forces it up against the under side of the log, by means of a joint and a segment slot and securing bolt, or the equivalents thereof, substantially as specified, so that the said roller can be inclined in any desired direction from a horizontal line to suit the inclination of the under side of the log and there secured to give efficient support, as set forth.

2. I also claim extending the chucks for supporting the ends of curved logs below the head and tail blocks so that the ends of such logs, in siding, may be supported below the surface of the head and tail blocks to bring the upper curved part within the range of motion of the saw, substantially as specified, when this is combined with the middle supporting rail on which the lower part of the chucks rest and by which they are supported during the operation, as set forth.



3. And finally in the method of indicat-  
ing the bevels and keeping the logs to them  
as it is being sawed, I claim the index hand,  
whose axis of motion is in a line as nearly  
5 so with the axis of rotation of the log, sub-  
stantially as specified, in combination with  
either of the side levers which have the same  
axis of motion as the index hand, and the  
adjustable or shifting inclined ways, sub-  
10 stantially as specified, so that as the carriage

advances with the log the passage of the  
side lever (whether on one side or the other)  
on the inclined plane set to the required  
bevel, will shift the index hand and indicate  
the true bevel, to enable the operator to turn 15  
the log to correspond as set forth.

JAMES HAMILTON.

Witnesses:

P. J. BUCKEY,

PATRICK M. MICKLE.