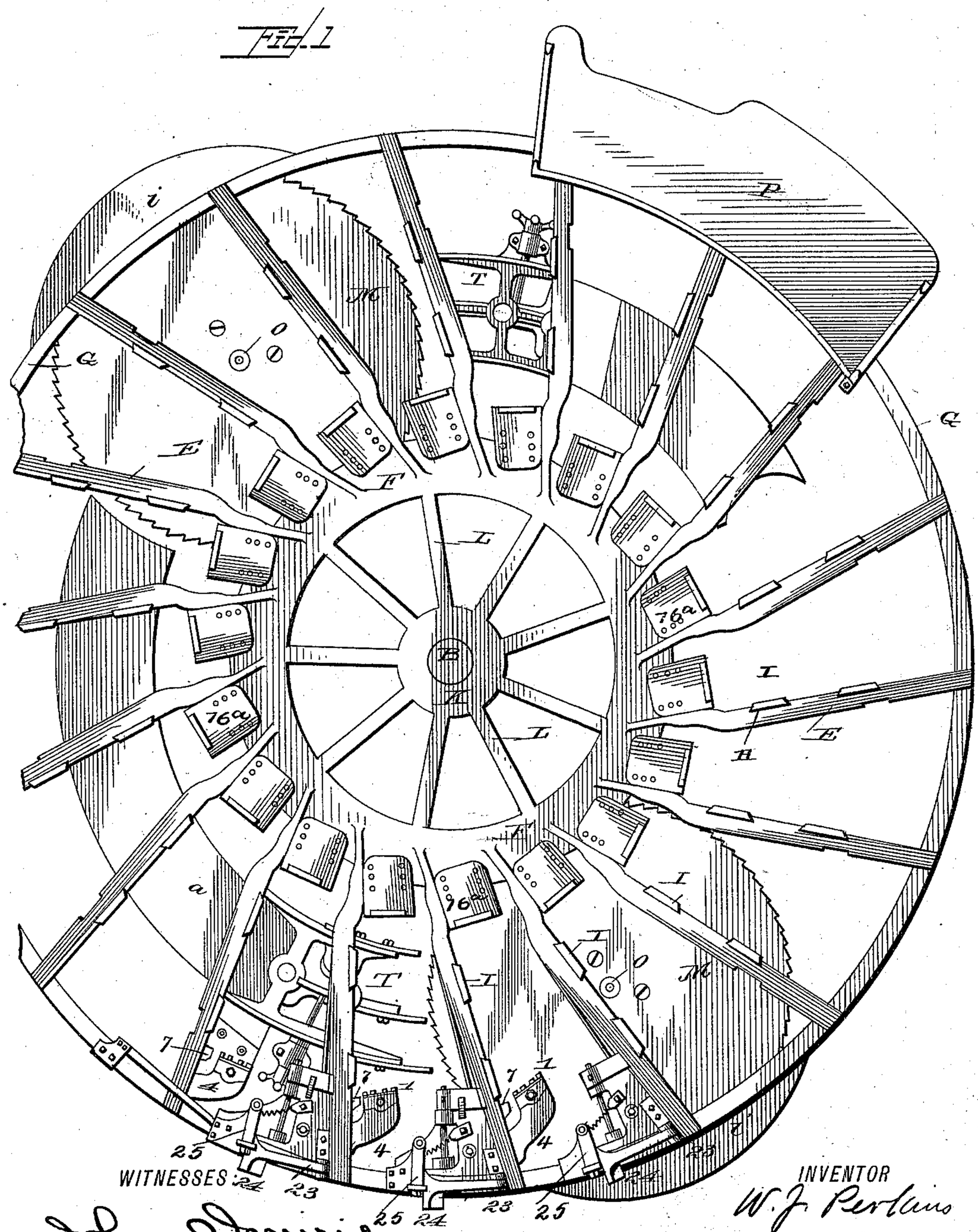
(No Model.) 8 Sheets—Sheet 1.

W. J. PERKINS.

SHINGLE SAWING MACHINE.

No. 561,282. Patented June 2, 1896.

Fig. 1.



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(No Model.) 8 Sheets—Sheet 2.

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SHINGLE SAWING MACHINE.

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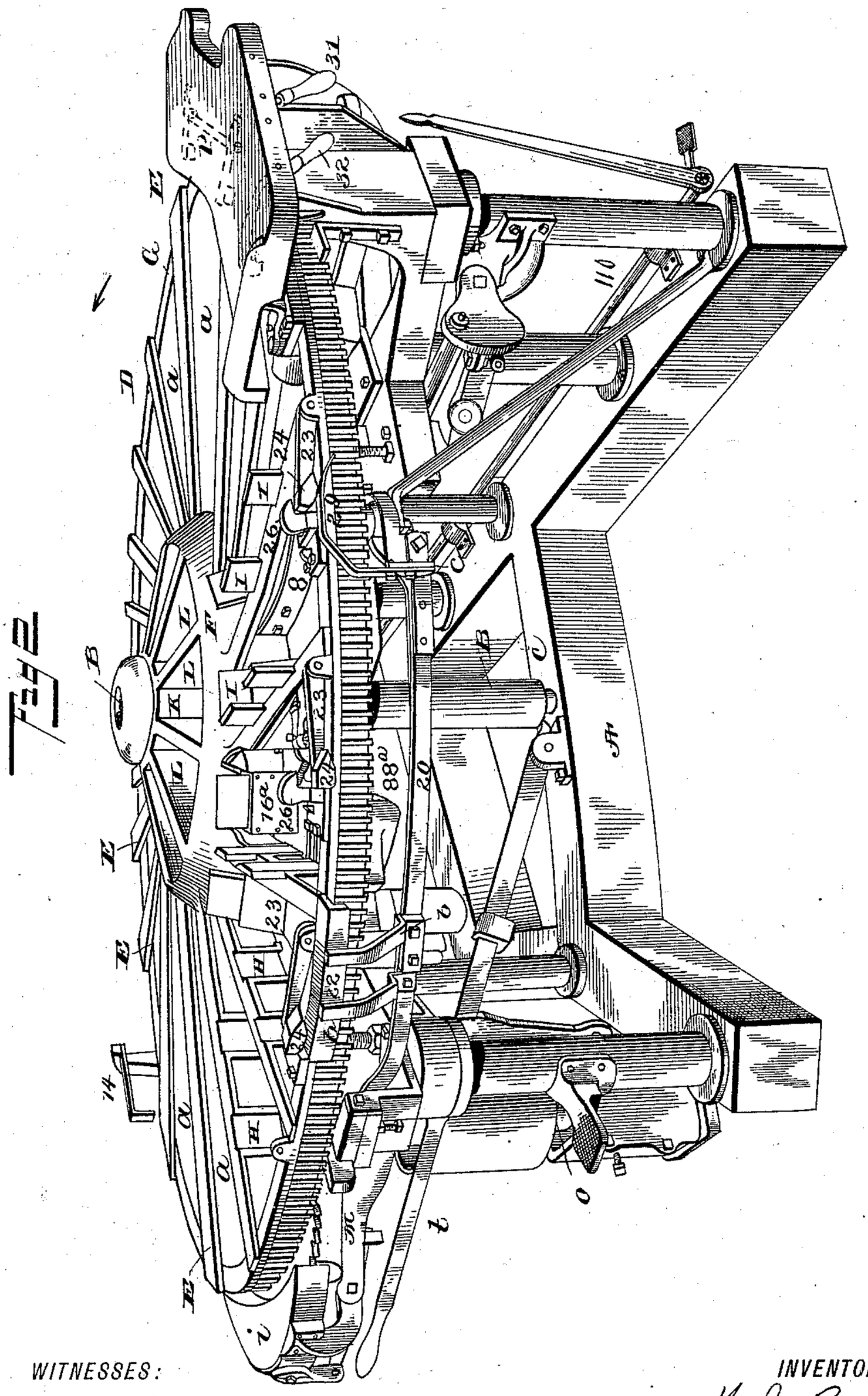

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No. 561,282. Patented June 2, 1896.

Fig. 13.

Fig. 14.

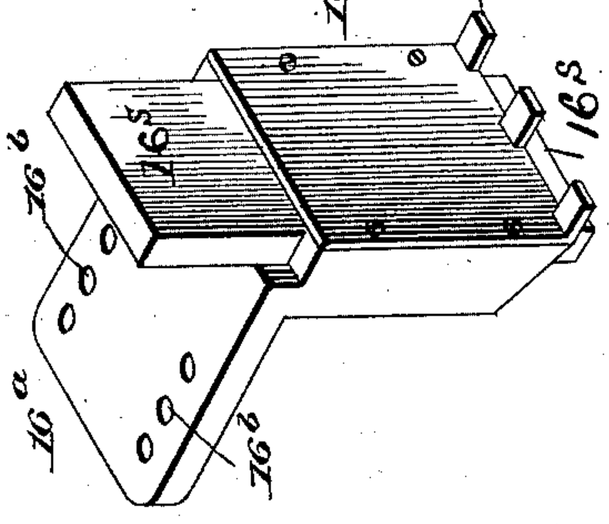
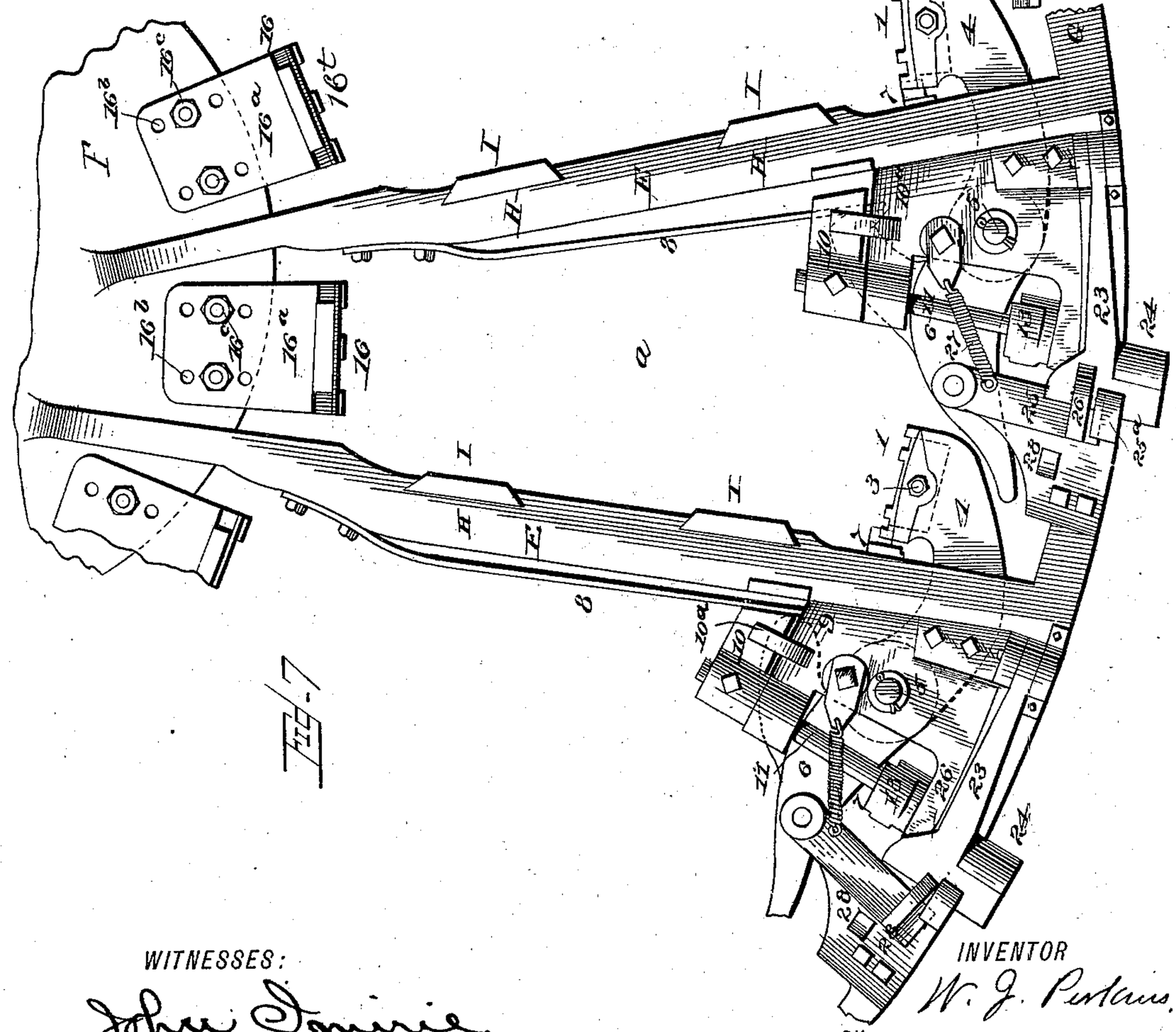


Fig. 17.



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(No Model.) 8 Sheets—Sheet 4.

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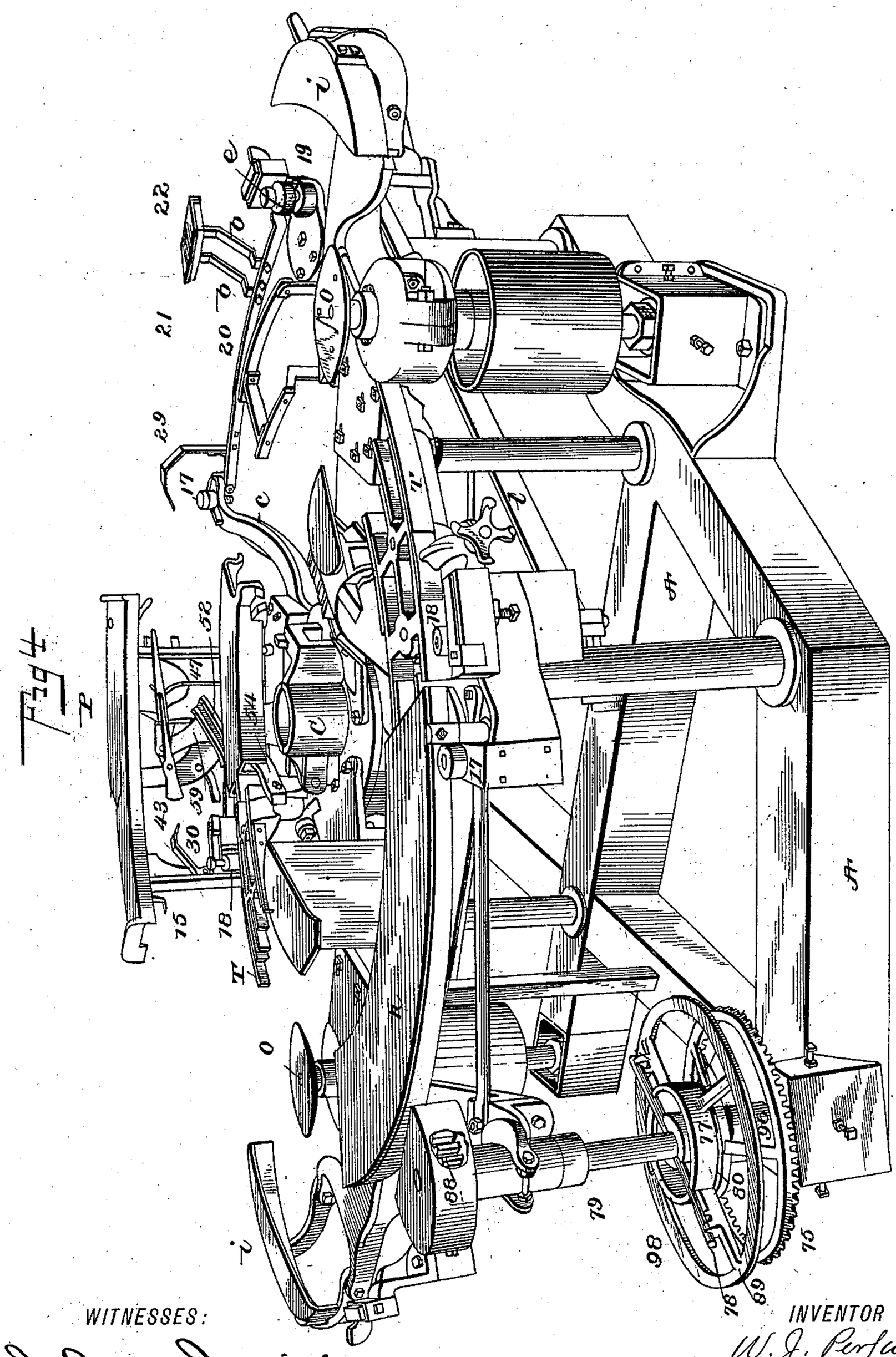
SHINGLE SAWING MACHINE.

No. 561,282. Patented June 2, 1896.



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No. 561,282. Patented June 2, 1896.

FIG. 5

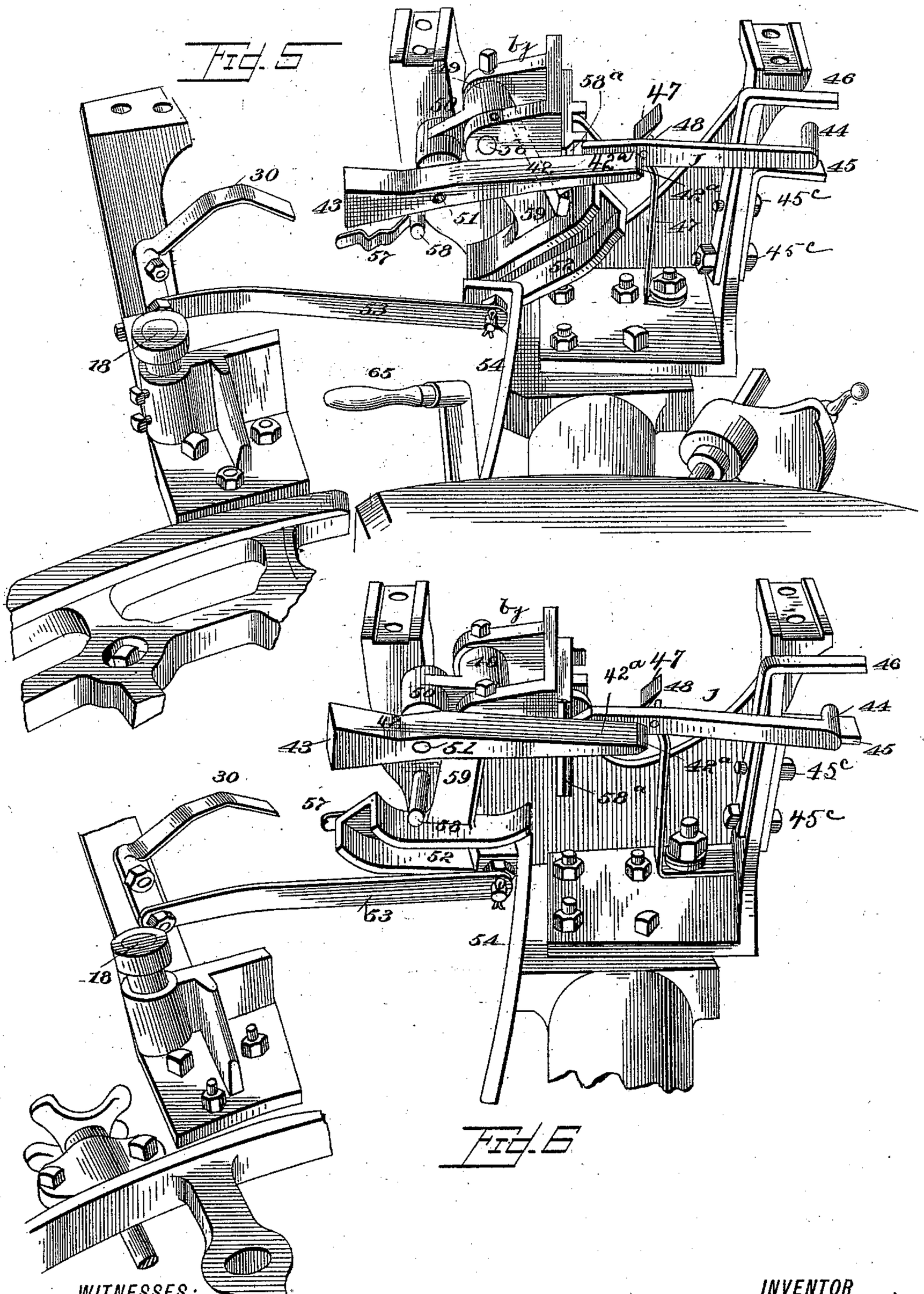

FIG. 6

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SHINGLE SAWING MACHINE.

No. 561,282. Patented June 2, 1896.

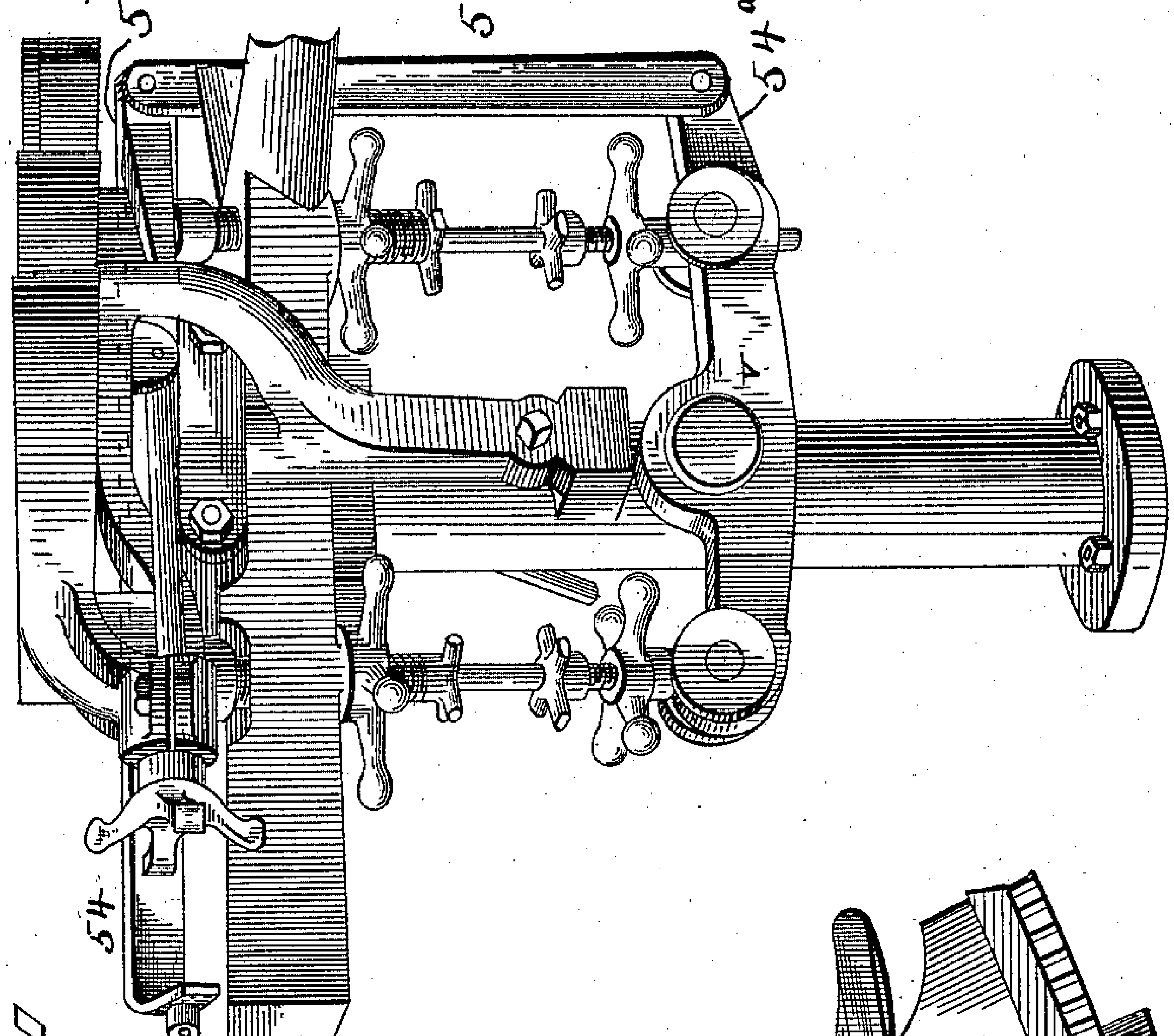

Fig. 10

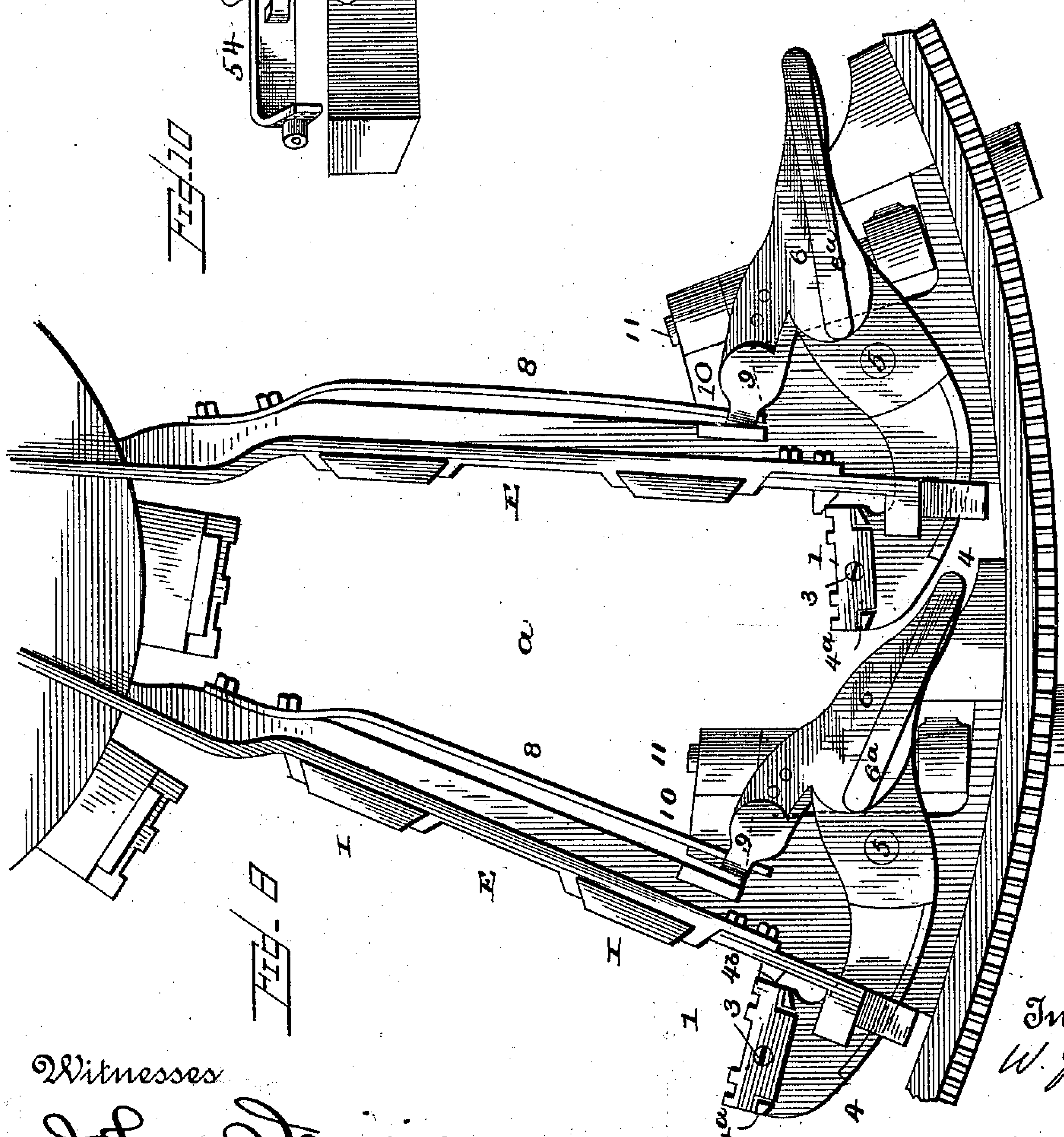

Fig. 8

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(No Model.)

8 Sheets—Sheet 7.

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SHINGLE SAWING MACHINE.

No. 561,282. Patented June 2, 1896.

FIG. 5

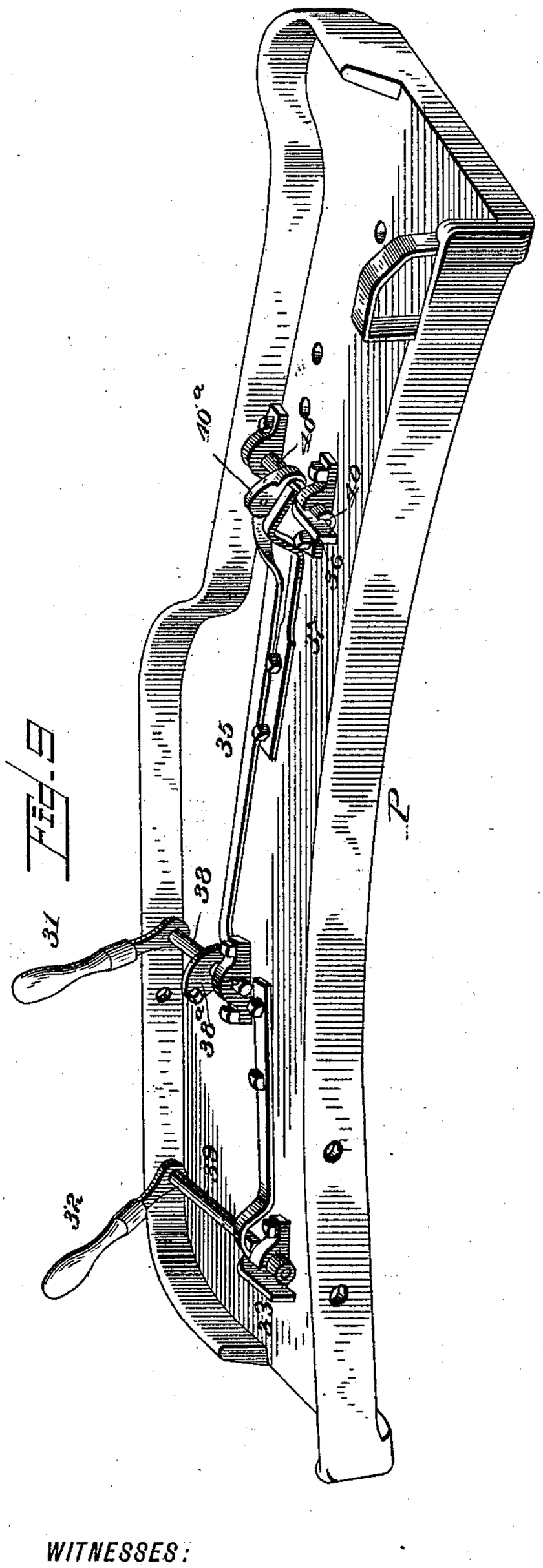


FIG. 6

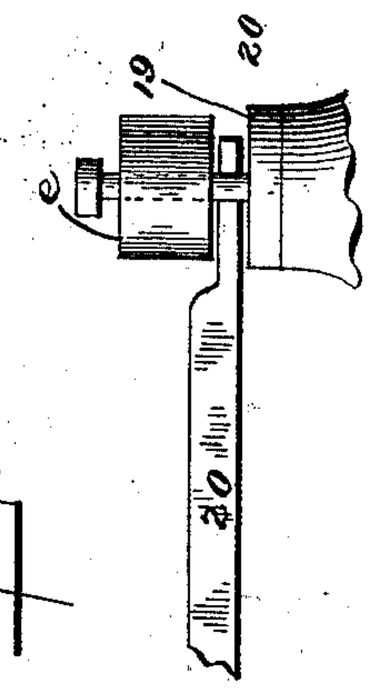
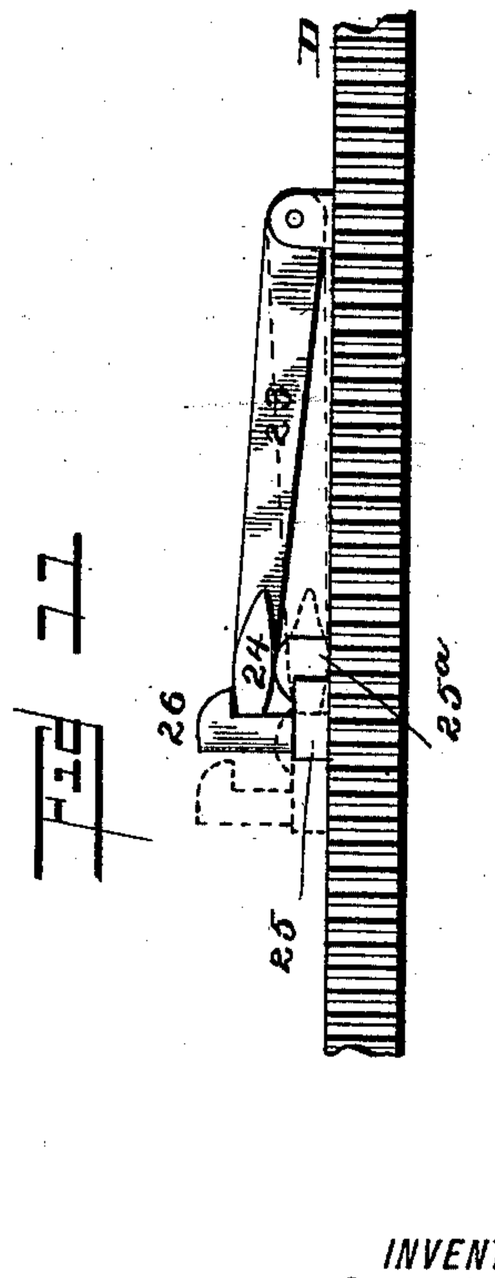


FIG. 7



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(No Model.) 8 Sheets—Sheet 8.

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SHINGLE SAWING MACHINE.

No. 561,282. Patented June 2, 1896.

Fig. 14.

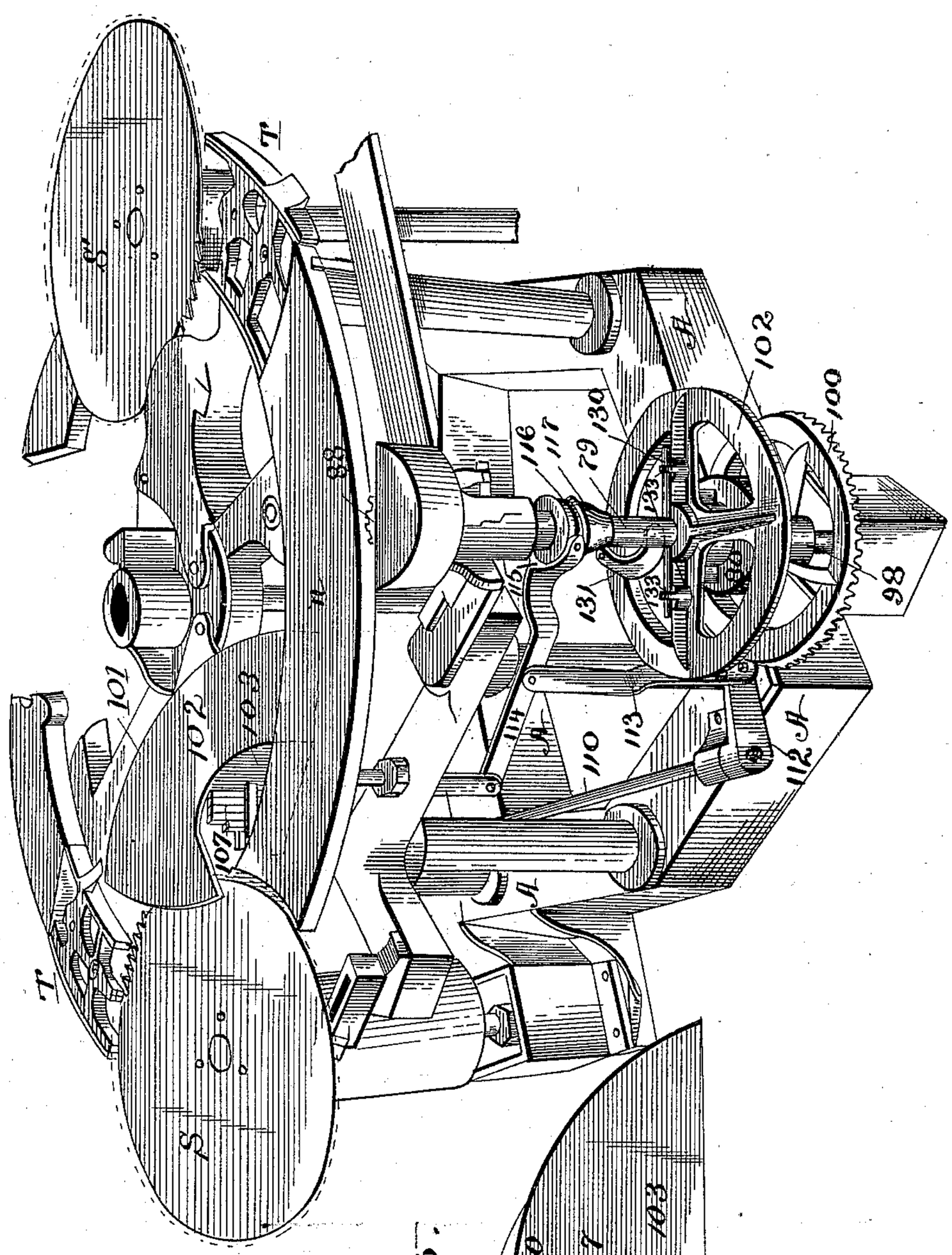
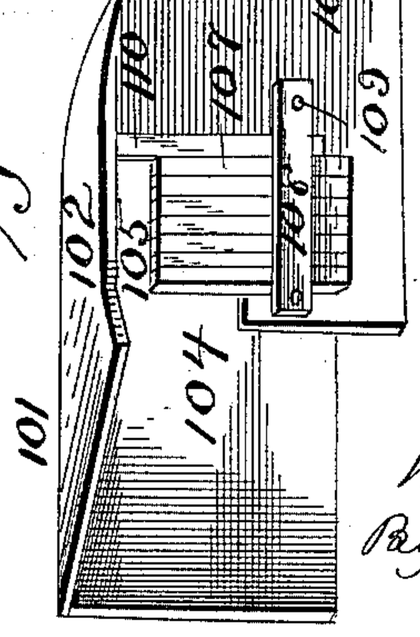


Fig. 15.



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Atty.

UNITED STATES PATENT OFFICE.

WILLIS J. PERKINS, OF GRAND RAPIDS, MICHIGAN.

SHINGLE-SAWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 561,282, dated June 2, 1896.

Application filed May 2, 1892. Serial No. 431,486. (No model.)

To all whom it may concern:

Be it known that I, WILLIS J. PERKINS, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Shingle-Sawing Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to shingle-sawing machines of the character in which a plurality of blocks are successively carried forward to the saws, although parts of the device are applicable to other shingle-machines.

The object of the invention is to improve the mechanism by which spalts or blocks may be dropped from the machine at the option of the sawyer, or when no more shingles are to be sawed therefrom, or for readjustment; also to improve the mechanism by which the tilt-tables may be shifted to set blocks so that the shingles will be of the highest grades; also to improve the dogging mechanism by which the blocks are held in the machine; also to improve the mechanism by which the carriage movement is effected; also to improve the sawdust-spouts and thereby prevent clogging of sawdust in them; also to improve shingle-machines of this class in various other particulars.

The machine illustrated is intended to have two saws and carry eighteen blocks; but these numbers, both regarding saws and blocks, may be varied.

Figure 1 is a top plan view of the machine, broken away at one side to enable a presentation on a larger scale and parts omitted. The details of dogging mechanism are shown in only a few of the carriage-compartments and sawdust-spouts omitted. Fig. 2 is a perspective view of the machine from the side near the operator's table, parts being omitted for convenience and clearness of illustration, the spalting mechanism being shown as far as may be in such figure. Fig. 3 is a detail of the static dog shown in perspective. Fig. 4 is a rear perspective of the machine, the carriage or rotary carrier being removed, one sawdust-spout omitted. Fig. 5 is a detail perspective of mechanism by which the tilt-table is adjusted, the mechanism being shown in normal position. Fig. 6 is a similar view of mechanism by which the tilt-table is adjusted in abnormal position. Fig. 7 is a broken top plan detail of the part of the carrier. Fig. 8 is a bottom broken plan detail of part of carriage or carrier. Fig. 9 is a bottom perspective view of operator's table and attachments. Fig. 10 is a perspective of tilt-table and supports. Fig. 11 is a detail of the operating wedge and support and connection. Fig. 12 is a broken detail of roller 19 and connections. Fig. 13 is a detail elevation of dogging-lever, showing dog-spring in section and the end of lock for said spring. Fig. 14 is a perspective view showing essential parts of the machine (the carriage removed) necessary to show the relation of saws to sawdust-spouts and also the friction driving-gear. Fig. 15 is a detail perspective of sawdust-spout.

The machine illustrated has a stationary frame of suitable form and strength in which the two saws are supported on vertical arbors at opposite sides of the machine. The carriage or carrier is pivoted at the center and rotates above the plane of the saw. The carriage or carrier is divided into eighteen compartments, so that eighteen blocks may be carried simultaneously and a shingle sawed from the bottom of each block with each rotation of the carriage and by each saw.

A indicates the stationary base of the frame of the machine, which is preferably a metallic casting, the parts being joined together by bolts or otherwise.

The carriage or carrier D is supported by a shaft B, which shaft is journaled in suitable bearings C C at the central part of the machine. The carriage or wheel D is divided into eighteen (more or less) compartments by arms E, extending from the central ring F to the outer ring G at such an obliquity to radial lines as will make the forward side of these arms E a proper pushing-face, by which the shingle-bolts are crowded forward, and to determine the best presentation of the shingle-bolt to the shingle-saw. The arms E preferably have dovetailed recesses H, which receive wooden blocks or bearers I, as usual in my machines of this class. These recesses and blocks are omitted, in connection with many of the arms in the illustration, the multiplication of details being considered unnecessary; but it will be understood that all the

shingle-bolt compartments are alike. The inner ring F is held to central hub K by spokes or arms L. Each compartment or carrier *a*, between the adjacent arms E E and the rings F and G, receives a shingle bolt or block (or more than one block) and has proper supporting-dogs to retain the block in proper position for the operation of the machine, mechanism being also provided for the release of the blocks from the dogs and for the adjustment of the blocks for engagement by the dogs, as will be subsequently explained.

At the outer end of compartment *a* of bolt-carrier I arrange the movable grasping-dog 1, Figs. 7 and 8. This dog has a lever on the bolt or pintle 5, which bolt extends into a web on the rear of arm E. The forward arm 4 of the lever projects in front of arm E and has a pivot 3, on which the dog 1 is supported and free to rock. Bosses or stops 4^a and 4^b on this lever 4 limit this rocking movement of dog 1 with relation to lever 4. The rocking movement is to permit the dog 1 to adjust itself to the end or ends of the shingle-bolts should the same be uneven. The arm 6 of the dogging-lever at the rear of pivot 5 is in the next succeeding compartment *a*. This arm 6 has a downwardly-projecting inclined or cam surface 6^a, which incline 6^a engages abutments or rollers 17 and 18, Fig. 4, during the rotation of the carriage-wheel. This engagement swings the dogging-lever on its pivot, throwing the arm 6 inward and arm 4 outward to withdraw the dog 1 from the block or bolt. The dog 1 is normally pressed toward the shingle-block by the flat spring 8, bearing against an arm 9, projecting from arm 6 of the dogging-lever. The spring 8 is secured in supports on bar E in any usual manner, and acts on the lever 9 and connections at all times to force dog 1 inward, except when the dog is forced out against the resistance of said spring, as by the cam and abutments already described. When the teeth of the dog 1 have been driven into the end of the shingle-bolt, the bolt or block may adhere to said teeth more or less, and in withdrawing said dog 1 the bolt may be drawn away from the static dog 16 at the other end of compartment *a*. The stop 7 on arm E projects far enough in front of the shingle-bolt to prevent this adherence of the bolt to the dog when the dog is fully withdrawn, so that when dog 1 is swung outward the bolt, block, or spalt will be entirely released from the dog and will fall by its own gravity.

The rock-shaft 11 is journaled in bearings on the arm E or on a web connected to said arm. Said rock-shaft has a projecting lug or arm 10 rigidly connected therewith. A hook or stop 10^a, connected to the arm or web of the carriage, limits the rocking movement of lug 10 in one direction. An arm 13, rigid with the rock-shaft 11, engages a spring 14 (on a fixed support above the carriage) at the proper time to rock shaft 11. Said time is preferably when one of the rollers 17 or 18 has engagement with incline 6^a. The engagement removes the tension of spring 8 from the arm 10, thus allowing shaft 11 to be easily shifted.

The engagement of lever 6 with either of its abutments 17 swings the dogging-lever, withdraws the dog 1, and compresses spring 8. The corresponding arm or lug 10 then falls by its own weight in front of said spring and holds the spring compressed until shaft 11 is rocked in reverse direction, as by engagement of lug 13 with spring or abutment 14, when the spring 8 is released from its lock and acts on the dogging-lever.

It will be understood that the form of arm 10 and its place of engagement to hold dog 1 open may be greatly varied without departure from the spirit of this invention; also that the dog proper may be supported in ways, as is common in this art.

The static dog 16 at the inner end of carrier A has the angle-piece 16^a and also carries the usual teeth 16^t and bearing-block 16^s. The piece 16^a has a number of bolt-holes 16^b, and the bolts 16^c passing through these holes into the ring F of the carriage-wheel hold the dogs in place. The dogs 16 may be thus adjusted to position to hold longer or shorter blocks, and when adjusted to position are stationary—that is, these dogs 16 when constructed as described do not open or close to grasp the shingle blocks or spalts during the operation of the machine in sawing.

The tripping-springs 14 and 15, Figs. 2 and 4, are so arranged on the frame with relation to the rollers or abutments 18 that as the rollers 18 engage lever 6, and thus compress springs 8, the springs 14 15 engage arms 13, rock the shaft 11, and release the spring 8 from the stops 10 at the time when said spring is compressed.

While the incline 6^a is moving in the rotation of the carriage-wheel from the roller or abutment 17 to the other abutment 18, which abutments are relatively fixed, the spring 8 is held compressed by the locking-lug 10, and the dogs are apart or open. The time of such passage may be utilized for putting new bolts into the carrier, or the bolt may be adjusting itself to a new position on the tilt-table ready for the cut of a subsequent shingle.

A mechanism for locking the dogs in open position is described and claimed in my application, Serial No. 319,528, dated August 2, 1889. The present mechanism differs from that, and the present construction is specifically claimed herein.

When the block or spalt is to be removed from the machine, a roller or abutment *e* is lifted into position to engage said lever 6, as will be hereinafter explained.

Referring now to Fig. 4, it will be seen that abutments or rollers 17 are carried on suitable supports on the frame and below the level of the carriage-wheel D. The cam-surfaces 6^a on the dogging-levers are in position to engage these rollers as the wheel revolves in the direction indicated by the arrow, Fig.

2. This engagement throws the dogs out of the blocks in the manner explained, and the locking-catches 10 keep their respective springs compressed, and the dogs therefore have no tendency to close toward the blocks again until the cams 6^a are passing the rolls 18, when by the operation of the appropriate spring-abutment 14 or 15, as the case may be, the dog-spring lock will be released and the springs throw the dogs again into operation. It will be seen that the relative location of the abutments 17 and 18 is such that the blocks are undogged a little before they pass onto the tilt-tables and are dogged just before they pass to the saws.

The saws M M are carried on the arbors O O, which arbors are adjustable in manner well known in this art, so as to maintain the saws in a proper position just below the shingle-bolt compartments *a*.

The wheel or carriage D, which has the compartments *a*, has an actuating-arm 23, pivoted to the wheel-rim or a support thereon opposite each compartment *a*. The rear end of this arm, as illustrated, Figs. 2 and 7, may have a limited vertical movement by swinging on the horizontal pivot. The arm 23 has a wedge-piece 24 secured thereto and preferably extending beyond the periphery of the wheel-rim. The button or holder 25 is pivotally supported on the wheel, and a spring 27, connected to said button and to some part of the wheel, tends to turn said button under the rear or following end of arm 23. (See Fig. 7.) The button 25 has a hook or catch 26 extending up above the end of arm 23, to limit the rise of said arm, and a gib or hook 25^a on the carriage-wheel holds down the outer end of the button 25. A stop or pin 28 on the wheel limits the backward movement of button 25. The arm 23 is normally held up by the button 25, turning under its rear end. By turning button 25 back and out from under arm 23 said arm is allowed to fall, carrying the wedge 24 into a lower or abnormal position, in which position said wedge becomes active to engage and actuate the tilt grainer or spalter, as will be described, and of course might actuate any other adjustable part which might be in proper position. When the projection 24 is in its abnormal or depressed position, it is in a plane to engage the lower face of inclined piece 22, Figs. 2 and 4, lifting and holding up said inclined piece. The piece 22 is connected by bars *b b* to the lever 20, which lever 20 is pivoted to an arm *c* of the frame and engages the roller *e* at its vertically-movable end.

The roller or pulley *e* is similar to rollers 17 and 18 and is preferably journaled on a short vertical shaft suitably supported in the hub 19 on the main frame. The lever 20 acts on said pulley in a manner common in shifting loose pulleys or studs bearing pulleys. While the wedge 24 is passing under the incline 22 and the plane surface 21, connected to said incline, the roller, pulley, or abutment *e* will be held up into position to engage incline 6^a on the dogging-lever, and thus undog the bolt or spalt; but when the roller *e* is down it will not act on the dogging mechanism. As soon as projection 24 runs out from under the piece 21 22 said piece will fall and the roller *e* will also fall, so as to be out of the way and not act on the dogging mechanism of the succeeding compartment unless set to do so. After the projection 24 passes out from under the piece 21 22 it rides up incline 29, which lifts arm 23 again into normal elevated position (where it will ride over without engaging piece 22) and the button 25 is drawn by its spring into position to hold up said arm 23.

The button 25 is thrown away from under arm 23 by engagement with a movable abutment, such as arm 36, (see Fig. 9,) under control of the operator.

Referring to Fig. 9, 31 indicates a handle rigidly attached to a short rock-shaft 38, which rock-shaft is supported in bearings under the operator's table P. Another rock-shaft 40 is held in bearings under the same table and at a little distance from and about parallel with shaft 38. Rigid arms 38^a and 40^a on the rock-shafts are connected by a link 35, so that the rock-shaft 40 partakes of the rocking movement of shaft 38. A spring 37 bears on shaft 40 (preferably on flattened surfaces thereof) to hold shaft 40 in either of its shifted positions until it be shifted by a sufficient force. The rock-shaft 40 carries an arm 36, which when turned down is in position to engage the projection 26 on button 25, but when turned up is above said projection. When handle 31 is turned to one side by the operator, shaft 40 is rocked (through the connections described) and arm 36 is turned down to engage projection 26. This engagement rocks or presses back the button 25, which causes wedge 24 to fall into operating position to engage incline 22. When button 25 has been rocked into engagement with stud or pin 28, it can yield no further, and the piece 26 then turns the arm 36 (against the resistance of the friction-spring 37) back to its original position, rocking the shafts 40 and 38.

As will be readily understood, the shafts 40 and 38 may be made to rock in opposite directions by connecting link 35 to the arms at opposite sides of the respective shafts. The stop or resistance piece 36 might be connected to the same shaft as the handle, as is shown at the left of Fig. 9, where handle 32, connected to rock-shaft 39, rocks the stop or resistance piece 33 into the path of projection 26 in the manner just described, and the operation of piece 33 on projection 26 and the counter operation of piece 26 is the same as just described.

From the foregoing it will be understood that the operator, by swinging the proper handle, (31 in this case,) can set the mechanism to drop a block or spalt from the machine

from a predetermined compartment, and that the handle is immediately returned to inoperative position and all the operative parts are automatically restored in due season, so that no succeeding compartment will drop its spalt or block until the handle has been again set. It will also appear that the handles may be arranged in convenient position for the operator and the trips or abutments may be some distance therefrom and in proper position to engage the working part on the carriage at the proper time. The sawyer may also actuate the projection 26 by his hand.

The tilt-tables T T are inclined in such manner relatively to the saws that the blocks lie on the table with one end lower than the other, in order to saw "butts" and "points" from the lower surfaces of the blocks or bolts. Their normal position is in an inclined position of opposite degree or any degree.

It is desirable to saw the shingles as nearly in the direction of the grain of the wood as possible; also to have knots and other defects located in the point of the shingle. If the blocks were straight-grained and free from defects, and if the dogging and carrying mechanism always operated perfectly, the result might be obtained by causing one of the tilt-tables to incline in one direction and the other in the opposite direction, and holding them permanently in such relation. Unfortunately such conditions do not often exist, and it becomes desirable to control at least one of the tilt-tables, so that, when considered necessary, two or more butts may be sawed in succession from one end of the bolt, thus approximating the direction of the grain of the wood, or "graining the shingle." Manifestly by placing one tilt-table at a permanent incline and having the other adjustable a machine of the character described will have a much greater capacity for "following the grain" than if both were fixed. I therefore illustrate the machine as having only one reversible tilt-table.

Of course it will be understood that both tilt-tables are adjustable as to height, inclination, &c., to provide for the thickness and bevel of the shingle, and tilting mechanism and controlling devices may be applied to the second tilt, if deemed desirable.

The tilt-table T and supports illustrated are substantially those described in my Patent No. 380,346, of April 3, 1888; but the means for tilting the reversible table are different, as will be described.

The table is reversed by means of a walking-beam V, as in the patent cited. The walking-beam has an arm 54^a, extending from one end, and the end of this arm 54^a is connected by link 54^b with a lever 54, carrying a boss or antifriction-roll arm which enters the camway 52 in the end of arm 59. Lever 54 is used for the purpose of handily transmitting movement to the walking-beam V; but other connections may readily be substituted.

Arm 59 is supported on a pivot 56 in the machine-frame or parts *b j* attached thereto, and is integral or rigid with arm 50, the two arms 50 and 59 forming a bell-crank lever. (See Figs. 5 and 6.)

Arm 50 carries a pin or pintle 51, on which the double incline or wedge 42 is pivoted. The end 42^a of this wedge is normally, as in Fig. 6, at such a height that the wedge-piece 24 on the arm 23 of the carriage will pass above the end 42^a of the wedge 42 when the arm 23 is in its elevated position; but when wedge or incline 42 is in position shown in Fig. 5 and wedge or trip 24 (on carriage-wheel) is in its lower or abnormal position said wedge or trip 24 will engage the lower side of wedge 42 at or near the point 42^a. The wedge 42 carries an extension J, which has a lug or projection 44 between stops 45 and 46 fixed on the frame, but which stops may be adjustable to the proper height, as by screws or bolts 45^c. The wedge 42 or its extension has a pin 48, which bears against spring 47, which is supported on the frame. The spring 47 is bent and by its pressure on the pin 48 tends to force said pin to the apex or angle of the spring. When wedge 24 (adjusted to its lower position) passes under the end 42^a of wedge 42, (see Fig. 5,) it first lifts the lug 44 until it strikes stop 46, at the same time compressing spring 47 by the pressure of pin 48 thereon. The stop 46 then becomes the fulcrum, and the further movement of wedge 24 lifts the thick end of wedge 42, thus moving pintle 51, and rocks the arm 50 of bell-crank lever 50 59. This rocks the arm 59 and swings the camway 52, causing the end of walking-beam 54 to follow the inclination of the camway 52 and shift the tilt-table. As soon as wedge 24 has passed the pintle 51, on which wedge 42 is pivoted, it acts on the end 43 of said wedge to rock the same and throw down the finger 44 to a central position between stops 45 and 46, spring 47 also assisting this movement and retaining the wedge 42 in the central position; but the arm 59 is not rocked by this final rocking of wedge 42 on its pintle 51. A friction-spring 57 bears against the side of arm 59 to hold said arm from rocking, except under proper impulse, and the camway 52 is preferably, also, of such form that the arm has a tendency to remain in either one of its extreme positions by reason of the engagement with the roll on beam 54. Suitable stops, as 58 58^a, prevent movement of arm 59 beyond the desired extent. When the arm 59 and wedge 42 are in the position shown in Fig. 6, each succeeding wedge or trip 24 on the carriage which is in its lower position will ride under wedge 42 without shifting the tilt-table, even should the wedge 24 lift the end 42^a of said wedge 42; but when the wedge 24 in its elevated position rides over the wedge 42 wedge 42 is pressed down, acting as a lever, the stop 45 being the fulcrum, and the pintle 51 serving to swing the bell-crank lever 50 59 and reverse the cam 52 and the walking-beam. Thus when any number of carriers or com-

partments in the carriage have wedges 24 set abnormally the first one only will act to tilt the table and all the others will pass without changing the table until a compartment comes along with wedge 24 in normal position, when the tilt-table will be instantly changed through the train of mechanism already described and will remain in the changed position until reversed by an abnormally-placed wedge 24. The walking-beam arm 54 is steadied by a link 53, which is pivoted to said arm and to a suitable support on the frame.

By means of mechanism which retains the tilt-table in adjustable position, as above described, I have twice as much time in which to actuate the tilt as would be the case where the tilt-table is set and reset for each change or carriage. This is an important advantage. When the tilt-table is shifted, the operation must be performed after the preceding bolt has passed off from the tilt and before the new bolt is grasped by the dogs and while said bolt is resting on the table.

By the construction described herein I am enabled to carry the edge of the tilt-table close to the edge of the saw, which is an important advantage, as the table will thus support the block while the saw is operating on it.

The general relation of the saws S S′ to the sawdust-spouts is shown in Fig. 14. The saws both run in direction to press the shingle-bolts toward the center of the carriage, and the sawdust is thrown away from the saws with great velocity by centrifugal force. As the sawdust is produced while the saw is cutting a shingle from the bolt the tendency of the saw is to throw the great mass of sawdust inward toward the center of the machine, although a part of the sawdust will naturally be carried by the saw-teeth some little distance before it leaves said teeth. Hence it is desirable to bring that side of the sawdust-spout which is the last to be passed by the saw as near to the saw-teeth as possible to prevent the saw or the windage thereof from carrying the sawdust clear beyond the sawdust-spout. The sawdust which is thrown horizontally from the periphery of the saws is received by the spouts, and the horizontal motion changed to a downward motion by the inclined top of the spouts. The bottoms of the spouts are left open entirely or in great part, so that there is no place for the wads of sawdust from the saw to find lodgment in the spouts. The spouts may be of various forms. The essential idea is that the spouts shall divert the sawdust as little as may be necessary from the natural direction in which it is thrown by the saw consistently with the collection of the sawdust.

The sawdust-spouts are short, and the top portion is inclined downward at such curve or angle as may be desirable, so as to efficiently guide the sawdust toward the center of the base of the machine, from which position the sawdust is carried away by any suitable or usual means, such as an opening in the floor, or a chute, spout, or power conveyer.

The sawdust-spout 101 has a top plate 102, which projects over the outer edge of the saw, and said plate curves downwardly, as indicated in Figs. 14 and 15. The spout has a side plate 103, which is nearly perpendicular. The edge of the saw runs close to this perpendicular side plate and throws the sawdust against said side plate and the top plate 102. The sawdust is guided by these plates inwardly and downwardly toward the center of the machine. The spout may have a side plate 104 to give it strength and stiffness, but is preferably open at the bottom. The side 103 shows a slot or notch 105 close to the top plate 102 of the spout. This notch extends into the spout far enough to receive the largest saw. As the saw wears away by filing it is desirable to close this notch. This is done in the present instance by movable pieces 107, which are merely rectangular strips, preferably of metal, held against the side of the spout by a clamp-bar 108, which clamp-bar is attached to the side plate 103 by bolts 109. As the saw wears away far enough to permit the closing of the notch one or more of these pieces 107 is forced up and held by the friction of the clamp, as shown at 110.

Of course many other ways of holding and adjusting the closing-pieces might be employed.

The carriage-wheel has a cog-gear 88ª on its periphery, and is driven by a pinion 88 on the vertical shaft 79, which shaft is supported in suitable bearings in the frame of the machine and at one side thereof. The pinion-shaft 79 has a hub 96 running loosely thereon, and is held against vertical movement by a collar 97 on the shaft below said hub. The hub bears a bevel-gear 100, to which the driving power is applied. The upper part of hub 96 has a friction-face 80. A friction-disk 101 on shaft 79 has an extended rim 102. This disk 101 is compelled to rotate with the shaft 79, but may move vertically thereon, the connection being such as is about to be described, whereby the rotation of the disk 101 causes the shaft 79 to rotate, and thus drives the carriage. Shaft 110 extends from near the sawyer's table, and is supported in suitable bearings, and may be rocked by lever 111 near the sawyer's table. Shaft 110 has a crank 112 firmly attached. This crank 112 is pivoted to a link 113, which link is in turn pivoted to a lever 114. One end of lever 114 is pivoted to a suitable support on the frame of the machine. The other end has a fork 115, which runs in a groove 116 in the cone-sleeve 117, which sleeve loosely surrounds the shaft 79. The link 113 has a step 120, which is under the lower face of rim 102, and the step and rim preferably have friction-faces, so that when link 113 is lifted up by the rocking of shaft 110 the step 120 will bear against the rim 102 and act as a friction-brake there-

for, tending to hold the rim 102 and therefore the shaft 79 against rotation. The sleeve 117 has a conical portion and a cylindrical portion. A strong steel bar-spring 130 extends through a mortise in the shaft 79, and a bell-crank lever 131 is pivoted in the mortise just above the spring. The other end of the bell-crank lever 131 rests against the conical sleeve. The ends of spring 130 rest in bearings 133, rigid with the friction-disk 101.

When shaft 110 is rocked in such manner as to draw down on link 113, the lever 114 acts to slide cone-sleeve down the shaft 79, and at the same time the brake-step 120 is depressed, removing the friction-stop from the disk 101. The cone-sleeve rocks the bell-crank lever 131 on its pivot as the conical portion enters behind the free end of said lever. When the cylindrical portion of the sleeve enters behind the bell-crank lever, said lever will be held to bear on spring 130. Spring 130 in turn depresses the disk 101, so that its friction-face is brought against the friction-face 80. The disk 101 is thus made to rotate with the hub 96, and as the bearings 133 clasp the sides of bar-spring 130 said bar-spring will be carried around with disk 101, and the shaft 79 will thus be rotated.

In case of too great a strain on the carriage, as by the dropping of a block from the dogs in position to arrest the carriage, the friction-face 80 will slip against the disk 101, and thus breakage will be avoided. The lifting of the cone-sleeve instantly relieves the friction-disk 101 from pressure and at the same time the brake 120 is applied, so that the carriage movement is quickly checked.

The wheel-rim 102 projects far enough to afford an easy handhold, so that the carriage may be easily turned by hand-power, as is sometimes convenient in adjusting the machine.

A flat table or guide-plate *n* under the carriage and leading from near one saw to the next tilt-table is a common feature in this class of machines.

A long lever *l*, extending from the outside of the machine to near the central arbor B and engaging a collar on said arbor, is for the purpose of lifting the shaft and carriage, as is well known in my machines.

There are no special features of novelty in the saw-arbors O and their supports, nor in the saw-guards *i*.

I have described the machine as constructed and used by me as containing valuable improvements. It will be understood that an expert mechanic, having the machine before him or a description thereof, might make many changes in parts by the substitution of mechanical equivalents without departing from the spirit of the invention. I therefore intend it to be understood that my claims embrace mechanical equivalents to such novel parts and combinations as are broadly claimed, as well as the specific constructions set forth.

In the present invention the adjunctive mechanisms by which the tilting, spalting, &c., are effected are carried to the outer part of the machine, where they are accessible to the operator. The movable dog is self-adjusting to blocks of uneven surface. The dog, when open, is held by a device which locks the spring and holds the same without the expense of power due to friction, as would be the case if a long bearing-surface on the frame were to engage the levers 6 and hold the dogs open for a considerable time. Such a mechanism has been used heretofore by me.

Heretofore it has been customary to drive the carriage in this class of machines by a belt leading from one of the saw-arbors. This was objectionable, as the bearings of the arbor from which the carriage was driven was liable to heat from the uneven strains.

Sometimes in dropping a spalt the spalt would catch in the machine by a splinter and striking some fixed part of the machine would suddenly stop the carriage and perhaps break the machine, or the accumulation of spalts or blocks under the machine would lead to the same disastrous results, or an uneven shingle-bolt would turn or twist in the dogs, leading to stoppage or breakage. The danger to the machine from such untoward happenings is nearly or quite overcome by the construction hereinabove described.

By means of the short horizontal driving-shafts and suitable cone-pulleys and a belt leading thereto I am enabled to vary the speed of the carriage within wide limits, and this without changing the speed of the saws.

It will appear from the foregoing that I have provided for a wide range of contingencies which in practice I have found to actually arise with machines of this class.

What I claim is—

1. In a shingle-sawing machine, the rotary carriage having a central ring and an outer ring connected to the central ring by oblique arms dividing the carrier into compartments, a static dog in each compartment connected to the inner ring, and a lever extending across the outer end of the dividing-arm, said lever carrying a self-adjusting dog at its end within one compartment, and a cam-surface by which it is operated extending below the adjacent compartment, all combined substantially as described.

2. The combination of the dogging-lever, the dog, and the spring actuating said lever, of a self-acting stop in position to engage said spring, when under tension, and means for throwing said stop out of engagement with the spring substantially as described.

3. The combination of the carrier, dogging-lever and dog and a spring actuating said lever, of a rock-shaft on the carrier having a stop in position to engage said spring and hold it inoperative, and an arm on said rock-shaft in position to engage an abutment outside the carrier and so rock said stop 8 out of engagement, substantially as described.

4. The rotary carrier having a block-compartment, a movable dog mounted on a lever near one end of said compartment, a spring tending to operate said lever in one direction, a plurality of abutments outside the carriage against which the lever is successively carried, and a retaining-stop operating to hold the lever while traveling from one abutment to the other, all in combination substantially as described.

5. The combination of the carrier, dogging-lever and dog, and actuating-spring substantially as described, of the spring-locking stop which holds said spring inoperative, and an abutment outside the carrier which disengages said stop, substantially as described.

6. The combination of the carrier having an opposing support, the dogging-lever and dog, and a spring actuating said lever, of an abutment outside the carrier with which the lever engages to open the dog, a self-acting stop engaging the parts to hold the dog open, a second abutment outside the carrier engaging the lever to place the spring under tension, and an abutment engaging and unlocking said stop, substantially as described.

7. The combination with the wall of the compartment or carrier, of the pivoted arm 23 connected thereto and the wedge 24 on said arm in combination with adjunctive mechanism arranged to be engaged thereby, a stop for limiting the upward movement of said arm, and means for holding said arm elevated so that the wedge may be in normal position, substantially as described.

8. The combination with the wall of the carrier, of the arm 23 connected thereto, said arm provided with the actuator 24 in combination with adjunctive mechanism arranged to be engaged thereby, a button or holder on the carrier in proximity to said arm, and a spring engaging said button to turn it under the arm when the arm is raised, substantially as described.

9. The carrier, the arm 23 connected thereto in combination with adjunctive mechanism arranged to be engaged thereby, the button or holder 25 in proximity to said arm and provided with catch or hook 26, to limit the movement of said arm, and a hook on the carrier to prevent the rise of said button or holder, in combination substantially as described.

10. The carrier, the arm 23 connected thereto and provided with actuator 24 in combination with adjunctive mechanism arranged to be engaged thereby, the holder in proximity to said arm having a hook to limit the upward movement of the arm, and a spring connected to the holder and acting to turn it under the arm, in combination substantially as described.

11. The carrier the arm 23 carrying the actuator in combination with adjunctive mechanism arranged to be engaged thereby, the holder in proximity to said arm and means for turning the holder under said arm, and an abutment or stop outside the carrier, movable into position to release the arm from the holder, substantially as described.

12. The wheel-carrier, the arm 23 pivoted thereto, the wedge-shaped piece 24 connected to said arm and extending beyond the periphery of the wheel, and means for holding said wedge in elevated or depressed position in combination with adjunctive mechanism arranged to be engaged thereby substantially as described.

13. The wheel-carrier, an arm or trip having an adjustment thereon, the actuator carried by said arm in combination with adjunctive mechanism arranged to be engaged thereby, the button or holder automatically moving to support said arm when free to do so, and a stop outside the carriage in position to engage said holder to release the arm, substantially as described.

14. The combination with the arm on the carrier having the actuator thereon, and means for holding said actuator in normal or abnormal position, of a movable dogging-abutment outside the carriage, and adjunctive mechanism connected to the abutment in position to be engaged by the actuator, by which said abutment is moved to position to engage the operating mechanism and open the dogs, substantially as described.

15. The frame, the lever 20, the roller *e* in position to be shifted by said lever and to act on the dogging mechanism when shifted, and an incline on the lever to engage with the actuator, in combination with the carriage having the actuator in position for such engagement, all combined substantially as described.

16. The lever 20, the roll *e* shifted thereby, the inclined piece connected to said lever, and the incline outside the carrier, and the carrier having the adjustable actuator in position to engage said inclines, all combined substantially as described.

17. The combination with the operator's table, of a handle, a retaining-spring controlling said handle to hold it in either of its adjusted positions, an abutment connected to the handle, the carrier, and the actuator connected thereto so as to engage an adjunctive part of the machine, said actuator being under control of said handle, substantially as described.

18. The operating-handle on the operator's table and a rock-shaft operated thereby, a second rock-shaft connected to the first by a link so that the rocking of the one shaft rocks the other, an abutment on the second rock-shaft in position to operate the actuator on the carrier as described, and a spring engaging the rock-shaft to hold the abutment in either of its adjusted positions, in combination with an adjunctive mechanism substantially as described.

19. The combination with the carrier having a movable abutment thereon connected to and in position to shift the actuator, to operate on an adjunctive part of the machine, of a support outside the carrier, and a mov-

able abutment thereon in position to shift into the path of the abutment on the carrier, and to be immediately shifted back by said abutment.

20. In a shingle-sawing machine, the carrier and an actuator carried thereby, a supporting-piece for the actuator having an abutment thereon and a spring to restore the support to position, and the operator's table having a rock-shaft thereon carrying an abutment in position to rock in front of the abutment on the carrier, and means for adjusting said rock-shaft in combination with mechanism controlling the relation of parts of the machine, substantially as described.

21. The operator's table having a rock-shaft with bearing-surfaces on which a spring engages, the spring connected to said table and bearing on the shaft so as to rock it in either direction after the initial movement, a handle connected to the shaft, and an abutment connected to the shaft and in the path of movement of some part of the actuator on the carrier all combined with adjunctive mechanism, including said actuator, controlling the relation of parts of the machine, substantially as described.

22. In combination with the carrier and an actuator thereon, an incline 22 outside the carrier with which said actuator may engage, a lever connected to said incline, and an abutment operated by the lever and carried thereby to position to operate on the dogging or similar adjunctive parts of the carrier, substantially as described.

23. The combination with adjunctive parts of the machine, of the carrier and actuator carried thereby, the incline 22 having an operating-surface and a retaining-surface, and a lever and abutment connected thereto substantially as described, whereby the lever and abutment will be shifted, and held in shifted position while the actuator passes the retaining-face of part 22, substantially as described.

24. The bell-crank lever 50, 59, the pivot connected to one arm of said lever and a wedge-piece carried thereby, and an actuator on the carriage movable into position to engage either side of said wedge and thus rock the bell-crank lever in either direction so as to actuate and in combination with an adjunctive part of the machine, the specified elements combined substantially as described.

25. The lever 50, connected to an adjunctive part of the machine substantially as described, the wedge-piece pivoted to said lever, and a plurality of stops supported by the frame, one or the other stop acting as a fulcrum, against which the wedge bears, and an actuator moving with the carriage, all combined.

26. The lever (as 50) on the machine-frame suitably connected to an adjunctive part of the machine, substantially as described, the wedge pivoted to said lever, adjustable stops on the frame between which the wedge is inclined and one of which acts as a fulcrum to the wedge-piece and an actuator carried by the carriage in position to engage one side or the other of said wedge, substantially as described.

27. The lever 50 suitably supported on the frame to act on an adjunctive part of the machine and wedge pivoted thereto, stops on the frame in position to act as fulcra to the wedge in its lever action, and a spring having engagement with the wedge to hold it in one of its positions to operate in combination with an adjunctive part of the machine, substantially as described.

28. The combination of the lever-arm 50 operatively connected to an adjunctive part of the machine, the wedge 42 pivoted to said arm and projecting at both sides of the pivot, stops at a little distance apart with one or the other of which said wedge 42 engages, and an actuator moving with the carriage, and acting on wedge 42 to swing arm 50, and on the extensions of the wedge at each side of the pivot to rock the wedge on its pivot, all substantially as described.

29. The tilt-table having a lever (as 54) connected thereto, the rocking beam engaging said lever to actuate the same and a link (as 53) pivoted to the lever and the frame, by which link said lever is steadied, all combined substantially as described.

30. The combination of the carrier, dogging-lever, and dog-actuating spring, of a locking-stop which relieves the dog from the pressure of the spring, and an abutment outside the carrier which disengages said stop and permits the spring to become operative, substantially as described.

31. The combination with the carrier having an actuator thereon, and an adjunctive part of the machine, of a support outside of the carrier, and a movable abutment thereon in position to be shifted into the path of the actuator and to be immediately shifted back by said actuator.

32. In a shingle-machine, a rotary carriage, an actuator moving synchronously with said carriage, and arranged to operate on adjunctive parts of the machine controlling the relation of the machine and block, and mechanism controlling the adjustment of said actuator so that the position of the actuator causes it to act on one or another of the adjunctive parts, all combined substantially as described.

33. The combination with the carriage-wheel and adjunctive parts of the machine operated by said trip of an arm or trip having adjustment thereon and extending beyond said carriage-wheel, and means for holding said arm or trip in adjusted position above and below a predetermined horizontal plane.

34. The combination with the carriage of an arm or trip having vertical adjustment thereon, and a stop outside of said carriage in position to adjust said arm or trip and adjunctive parts of the machine controlled by

said arm or trip when adjusted to controlling position.

35. In a rotary shingle-machine, the combination of a rotary carriage-wheel, a saw rotating in a horizontal plane, and a sawdust receptacle or spout constructed to receive the sawdust as it is thrown from the saw at its outer end, and to compel and direct the same toward the central part of the base of the machine, substantially as described.

36. The combination with the rotating saw, of a sawdust spout or receptacle opening toward the saw to receive the sawdust, and extending inwardly and inclined or bent downwardly toward the central part of the base of the machine, substantially as described.

37. In a rotary shingle-machine, the combination of a rotary carriage-wheel, a circular saw rotating in a direction opposite to the movement of said carriage-wheel, and a sawdust receptacle or spout extending from said saw inwardly and inclined downwardly to direct the sawing toward the central part of the base of the machine, substantially as described.

38. In a rotary shingle-machine, the combination of a rotating carriage-wheel, a plurality of circular saws in horizontal planes near the rim of the wheel, and a plurality of sawdust-spouts, each spout opening at the part next to the saw and bending downwardly to direct the sawdust substantially toward the center of the base of the machine, substantially as described.

39. In a rotary shingle-machine, the combination of a saw rotating in a horizontal plane, a sawdust spout or receptacle open at the side next to the saw and at the bottom, but closed at the top, substantially as described.

40. The rotary carrier, the sawdust-spout beneath the same and having a notch therein, the saw running in a horizontal plane and having one edge entering said notch, and a series of pieces clamped to the spout but movable across the notch, in combination substantially as described.

41. In a shingle-sawing machine, the rotating carriage and a saw rotating in a horizontal plane, the sawdust-spout having inclined top and perpendicular side with a notch therein, a clamp-piece connected to said side plate, and a series of movable pieces held by said clamp and movable to close said notch, all combined substantially as described.

42. The vertical driving-shaft and its geared connections to the rotary carriage the horizontal shaft having geared connections to said vertical shaft, the sleeve on said horizontal shaft having bearings in which a second shaft is supported and having geared engagement thereto, and links and set-screw connections by which the second shaft may be adjusted rotatively about the first, all in combination.

43. The rotary block-carrier, the vertical shaft having geared connection thereto, and a driving-shaft operated from a power independent of the saw-arbor and communicating power to said vertical shaft, all in combination.

44. The rotary block-carrier, the vertical shaft having geared engagement therewith, a shaft driven independently of the saw-arbor, and friction driving-gear intermediate said shafts, whereby the carriage is permitted to stop on obstruction independently of the saw, all combined substantially as described.

45. The combination of two pulley-shafts substantially parallel to each other, two cone-pulleys one on each of said shafts and one or both of said cone-pulleys adjustable longitudinally, a rotary block-carrier, and a vertical shaft having gear connection to said carrier, substantially as described.

46. In a shingle-machine the combination of a movable shingle-bolt carrier and adjustable actuator thereon, a tilt-table, and a plurality of abutting surfaces adapted to shift the tilt-table and to restore the same to its normal position at substantially the same point of the rotation of the shingle-bolt carrier, substantially as described.

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

WILLIS J. PERKINS.

Witnesses:
ARTHUR C. DENISON,
EDWARD TAGGART.