

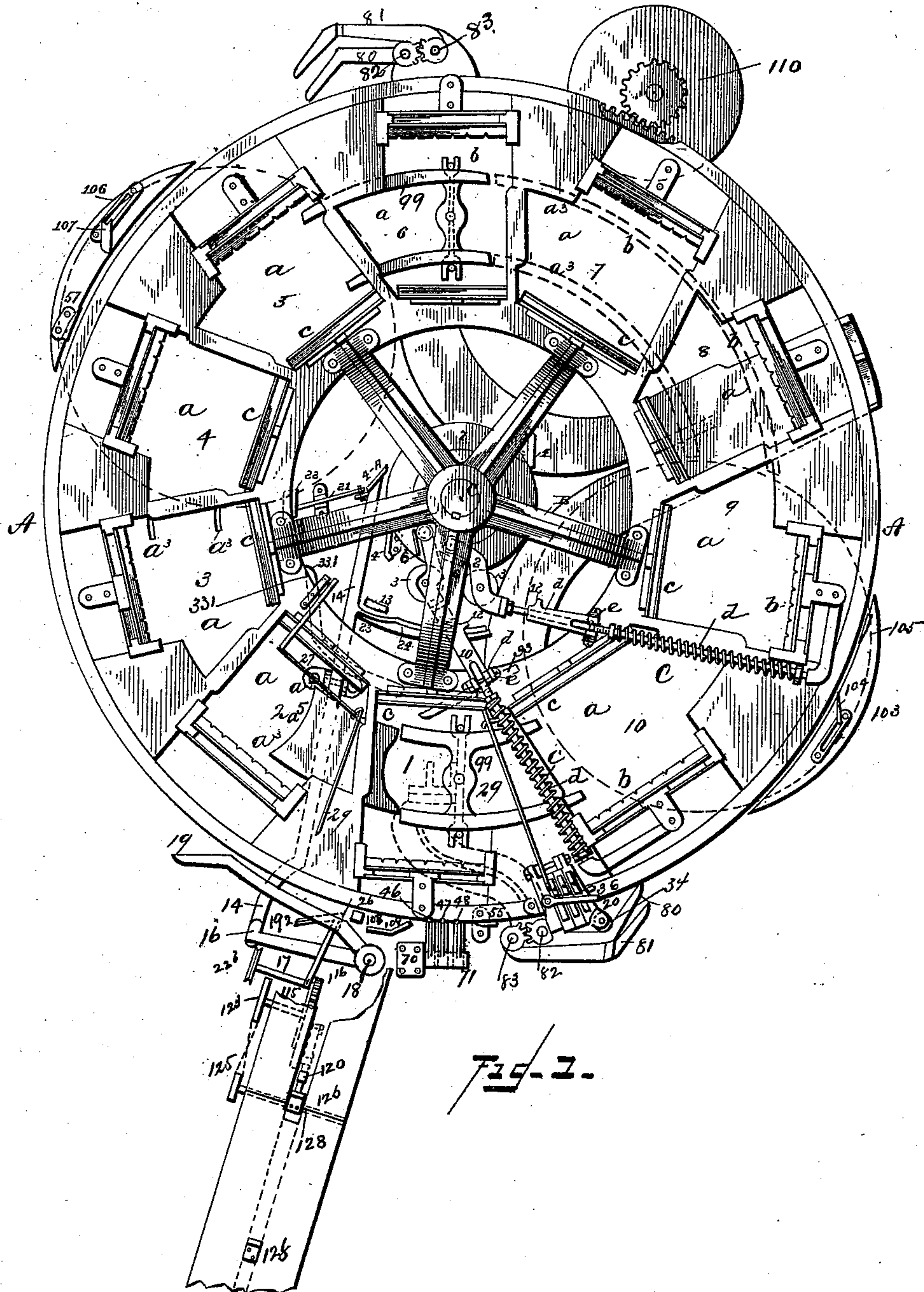
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9 Sheets—Sheet 1.

W. J. PERKINS.
SHINGLE SAWING MACHINE.

No. 561,279.

Patented June 2, 1896.



WITNESSES
P. L. Ourand
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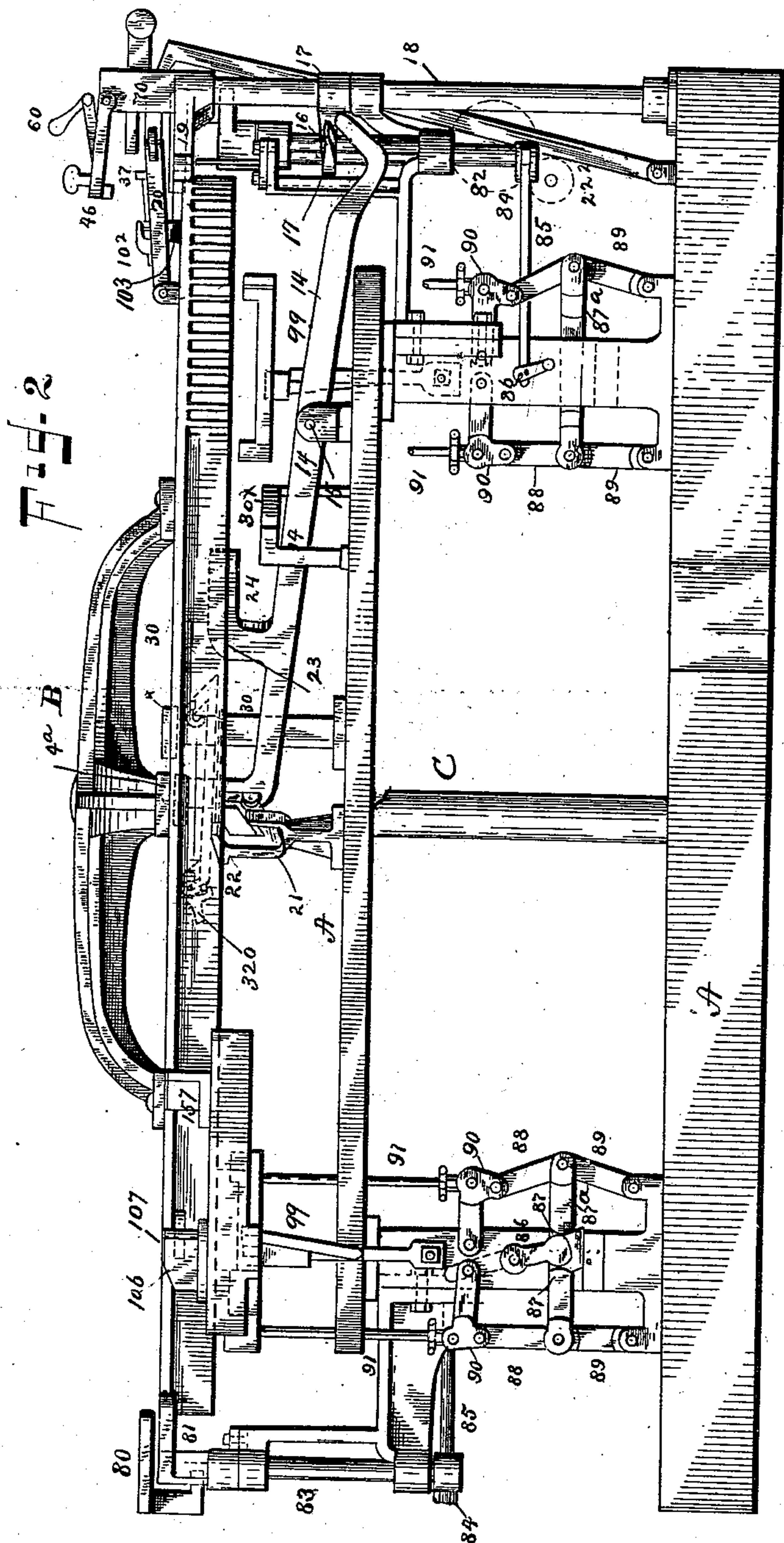
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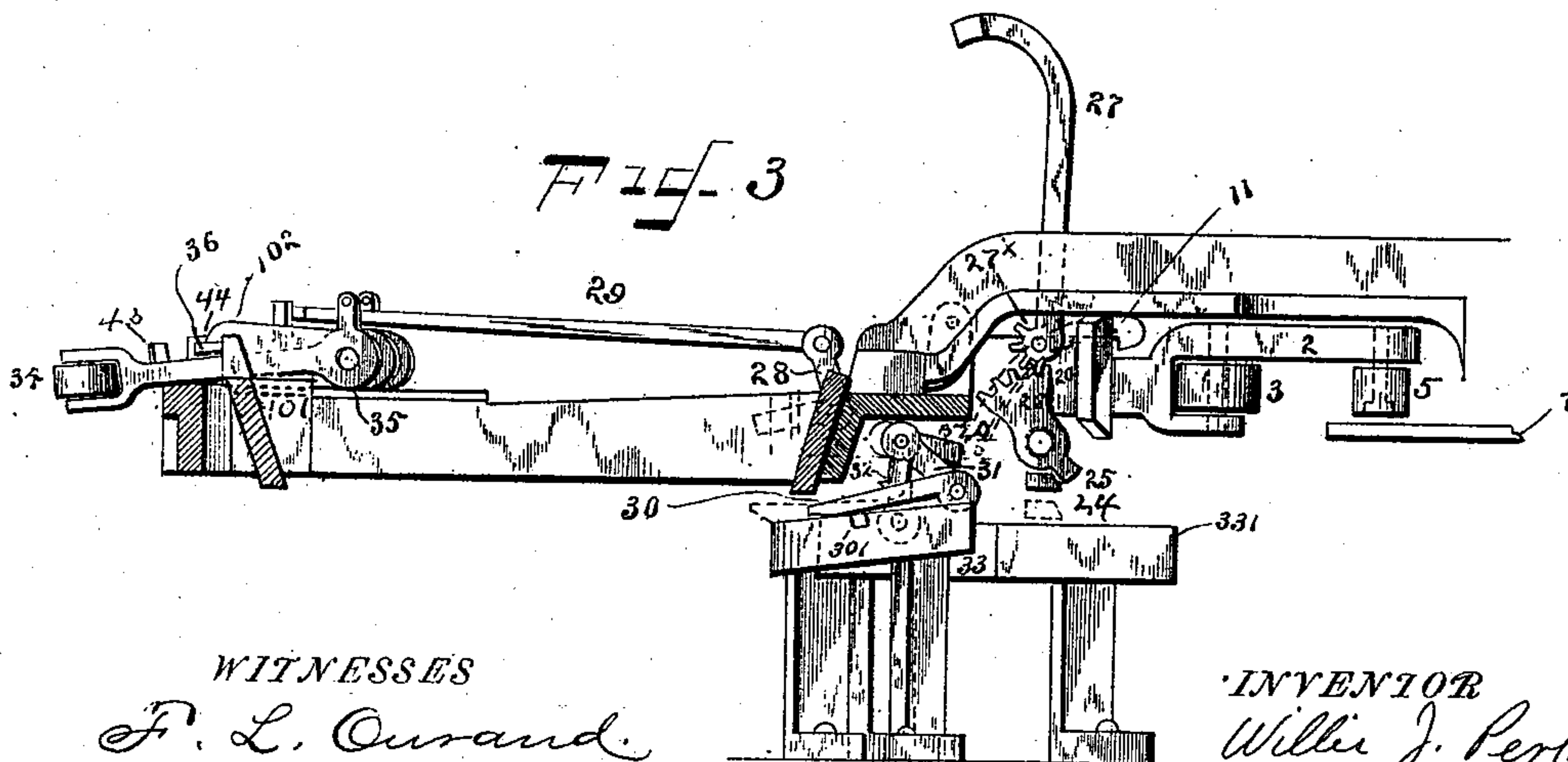
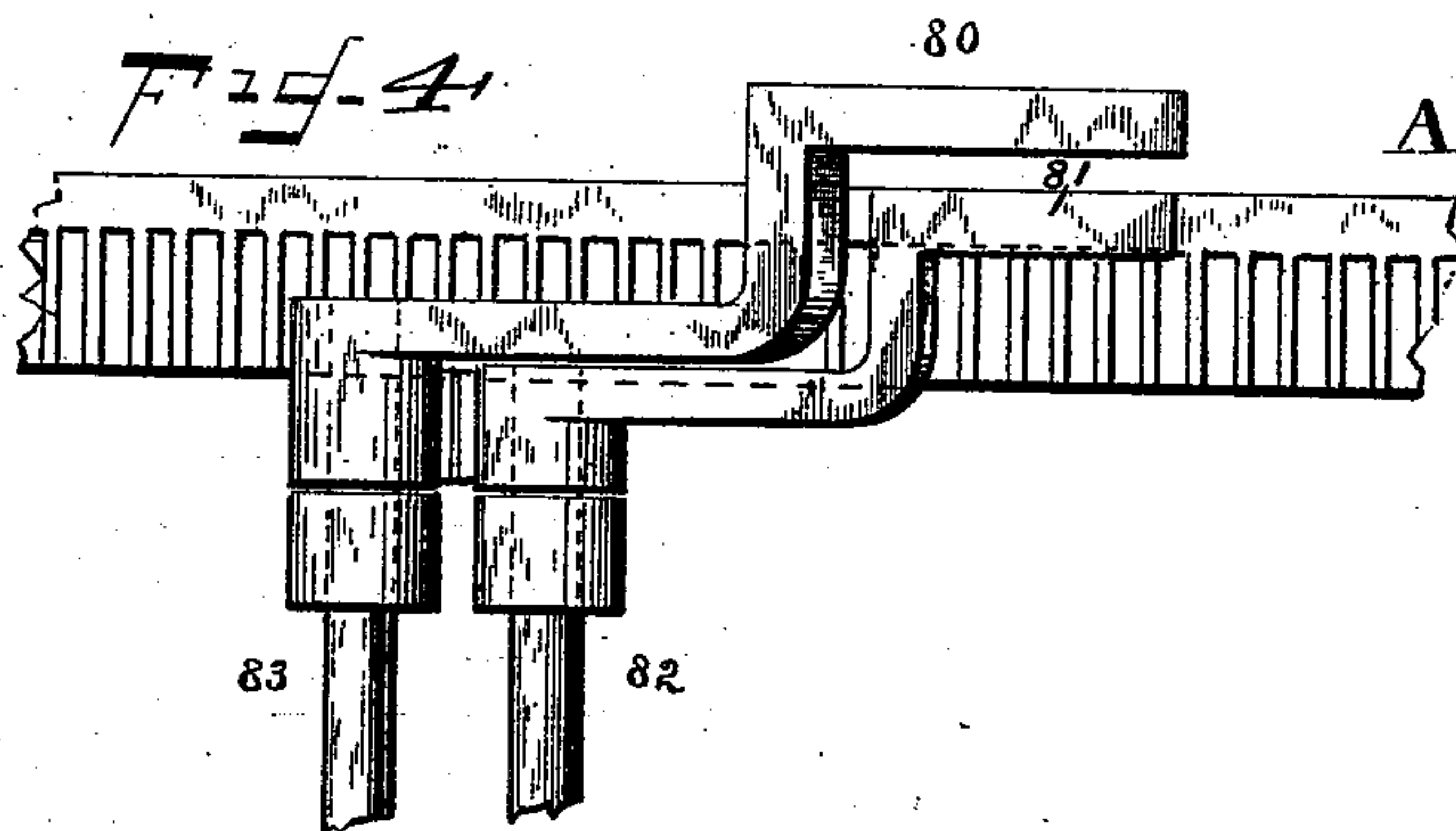
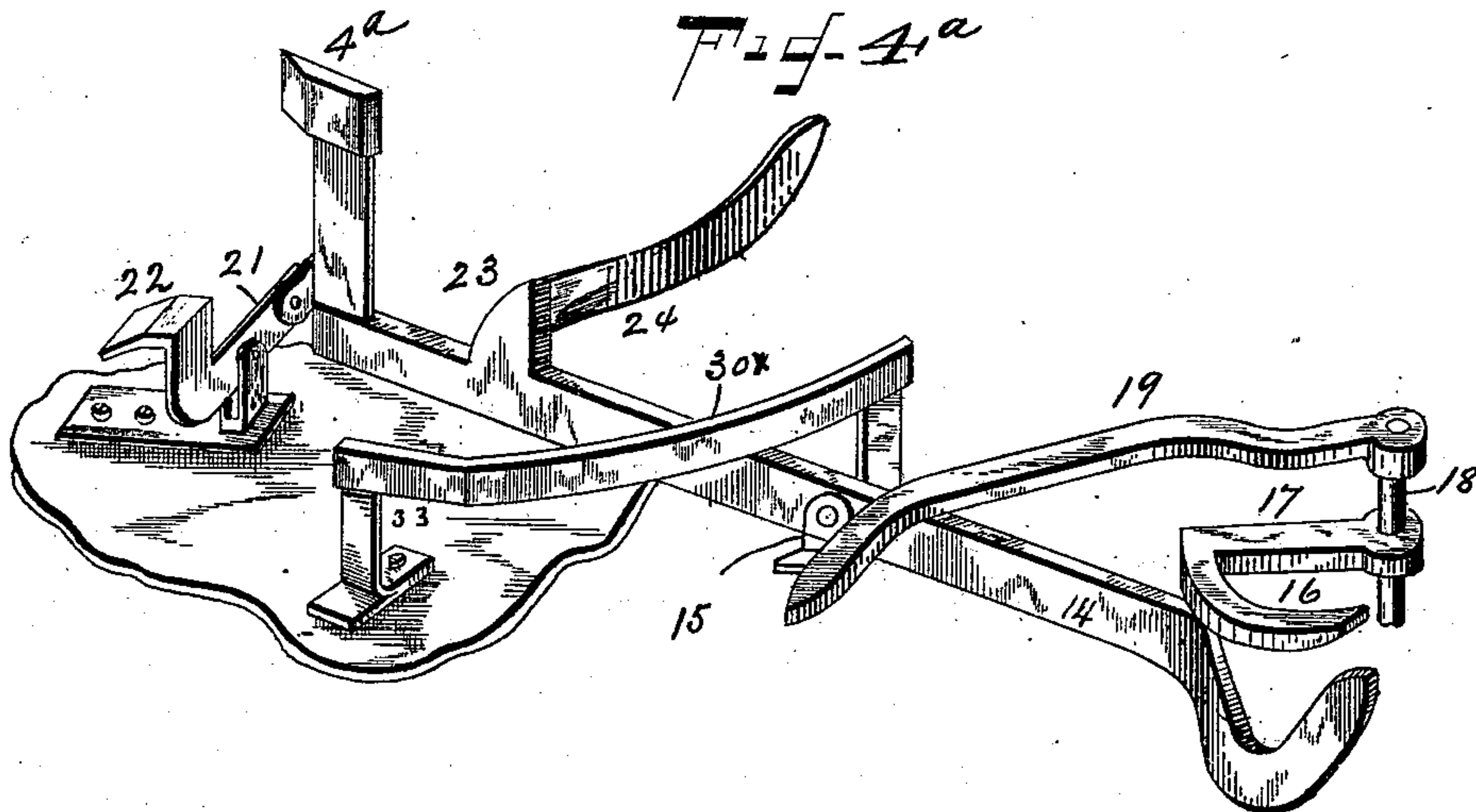
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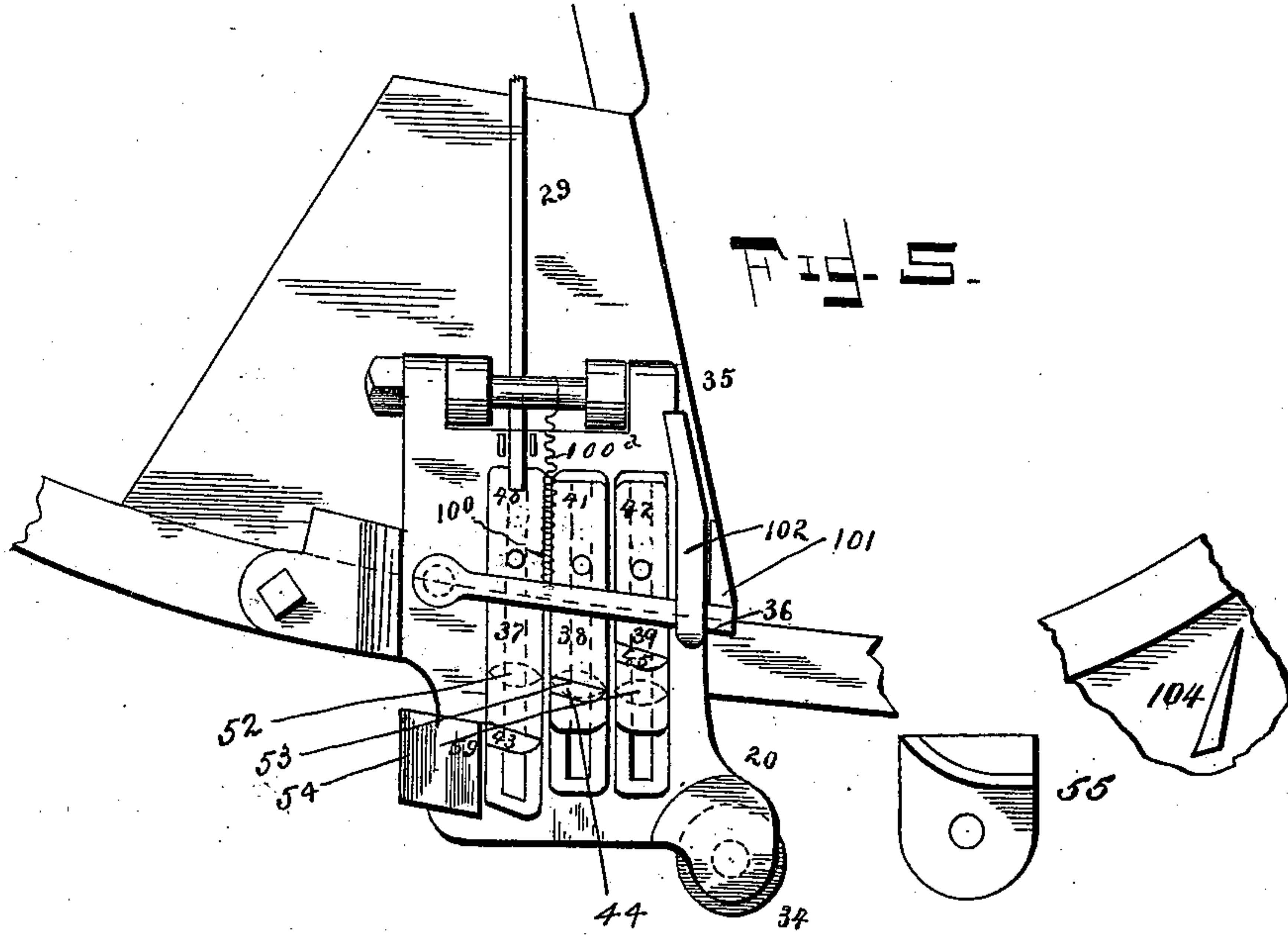
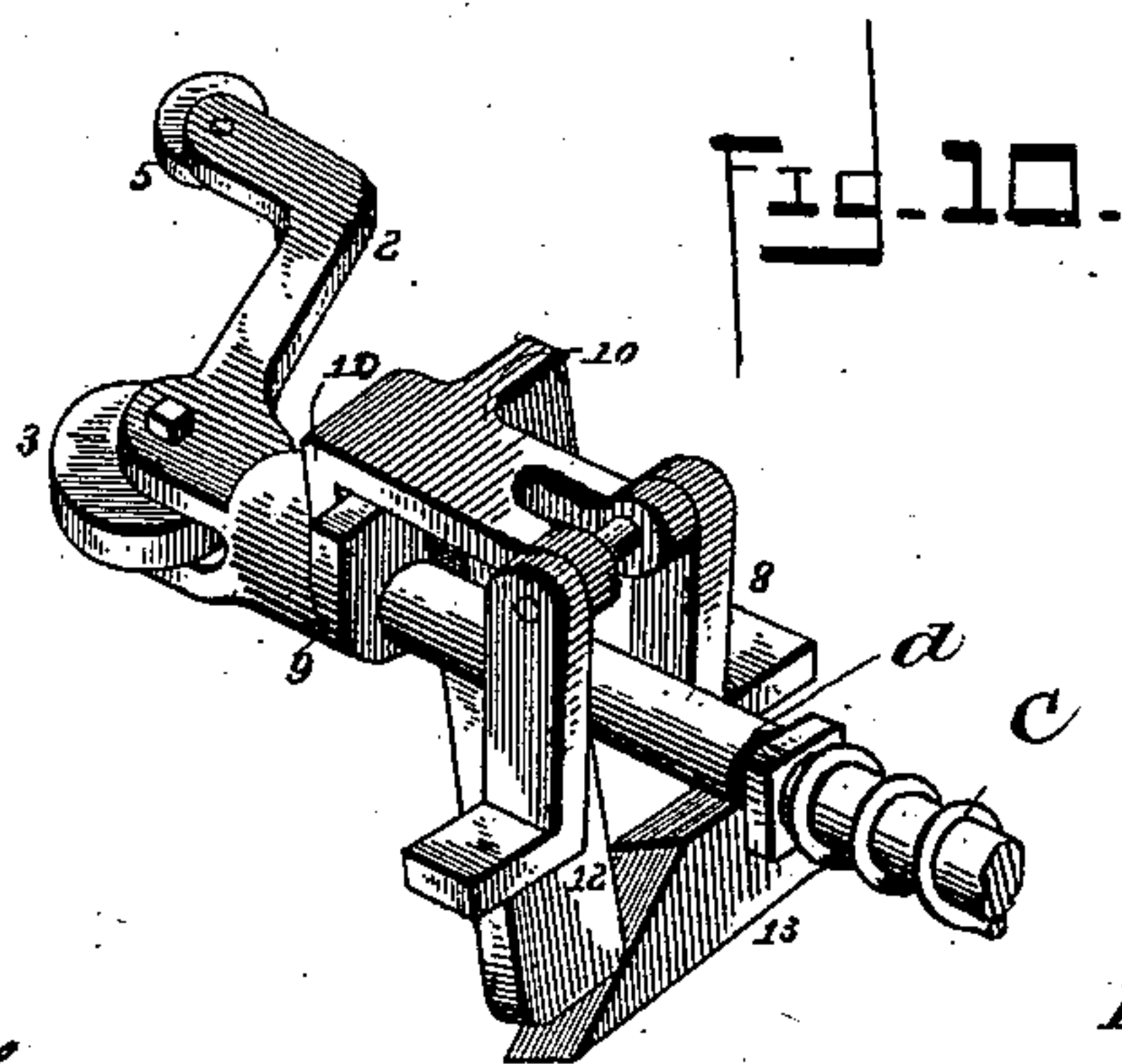
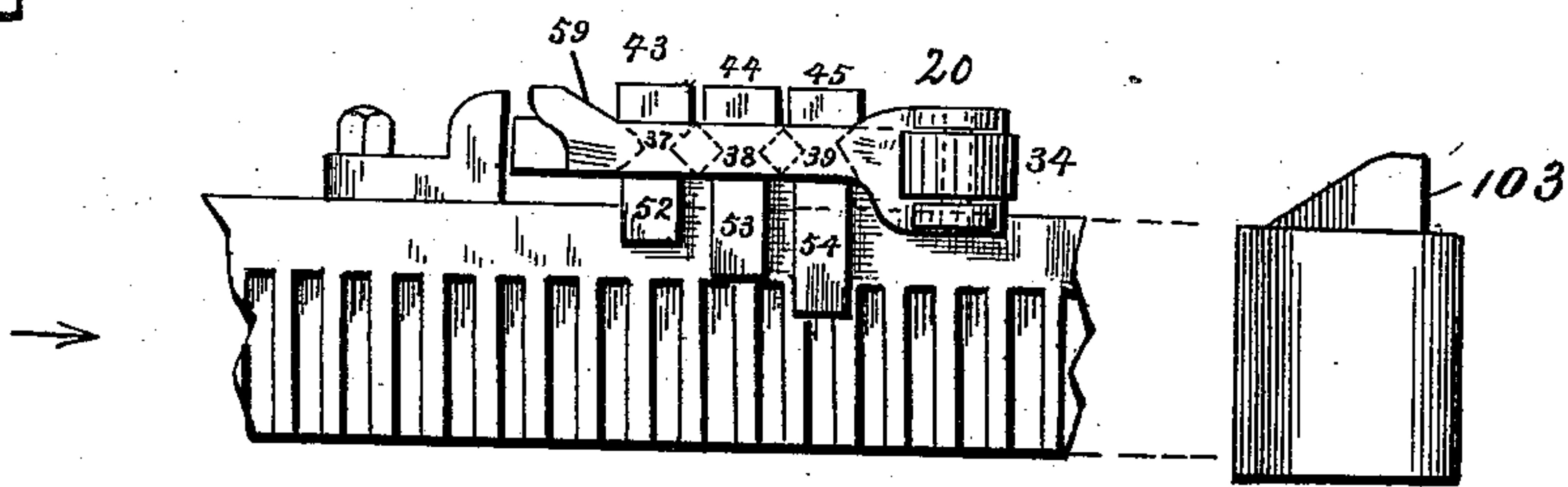


Fig. 6.



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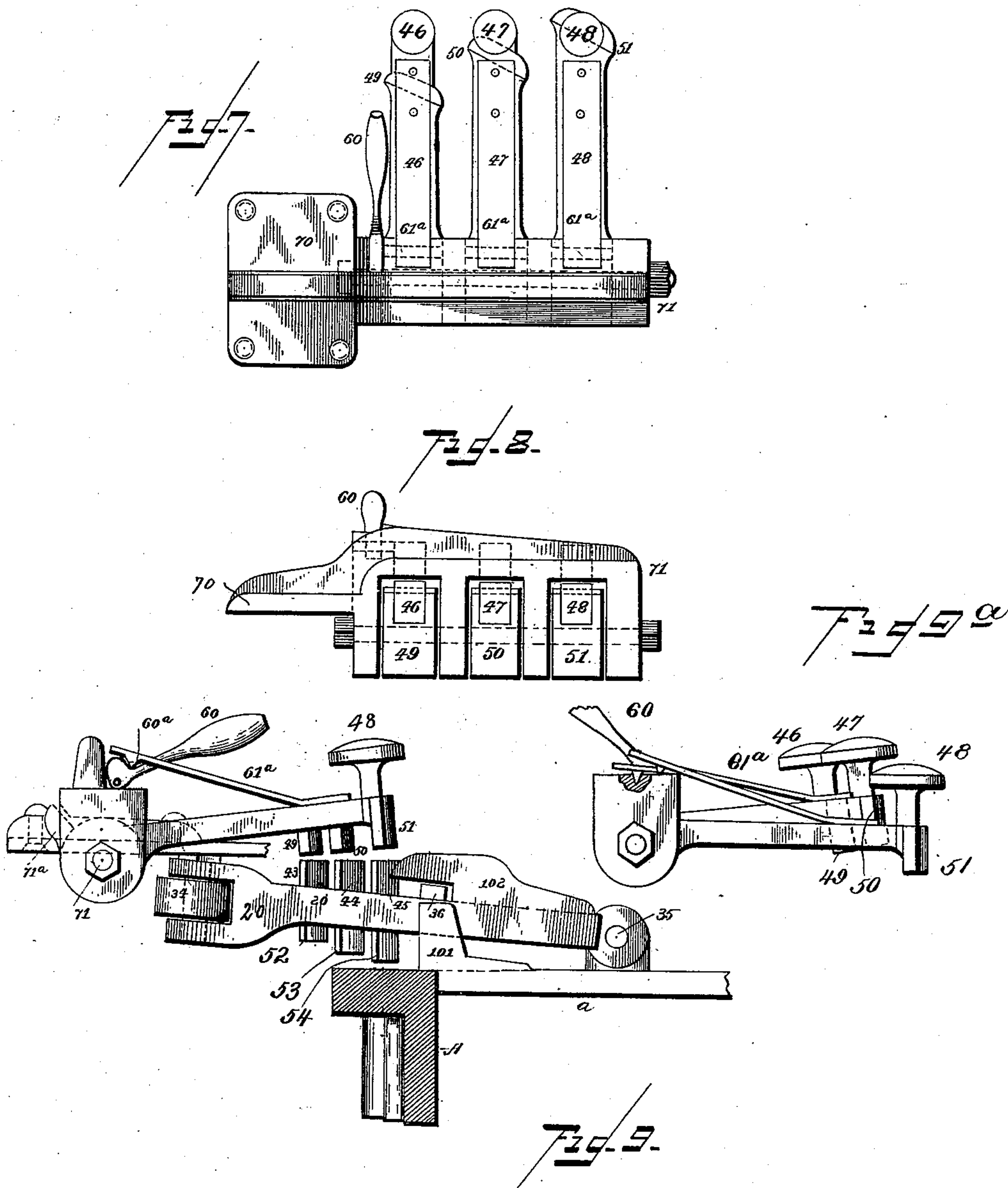
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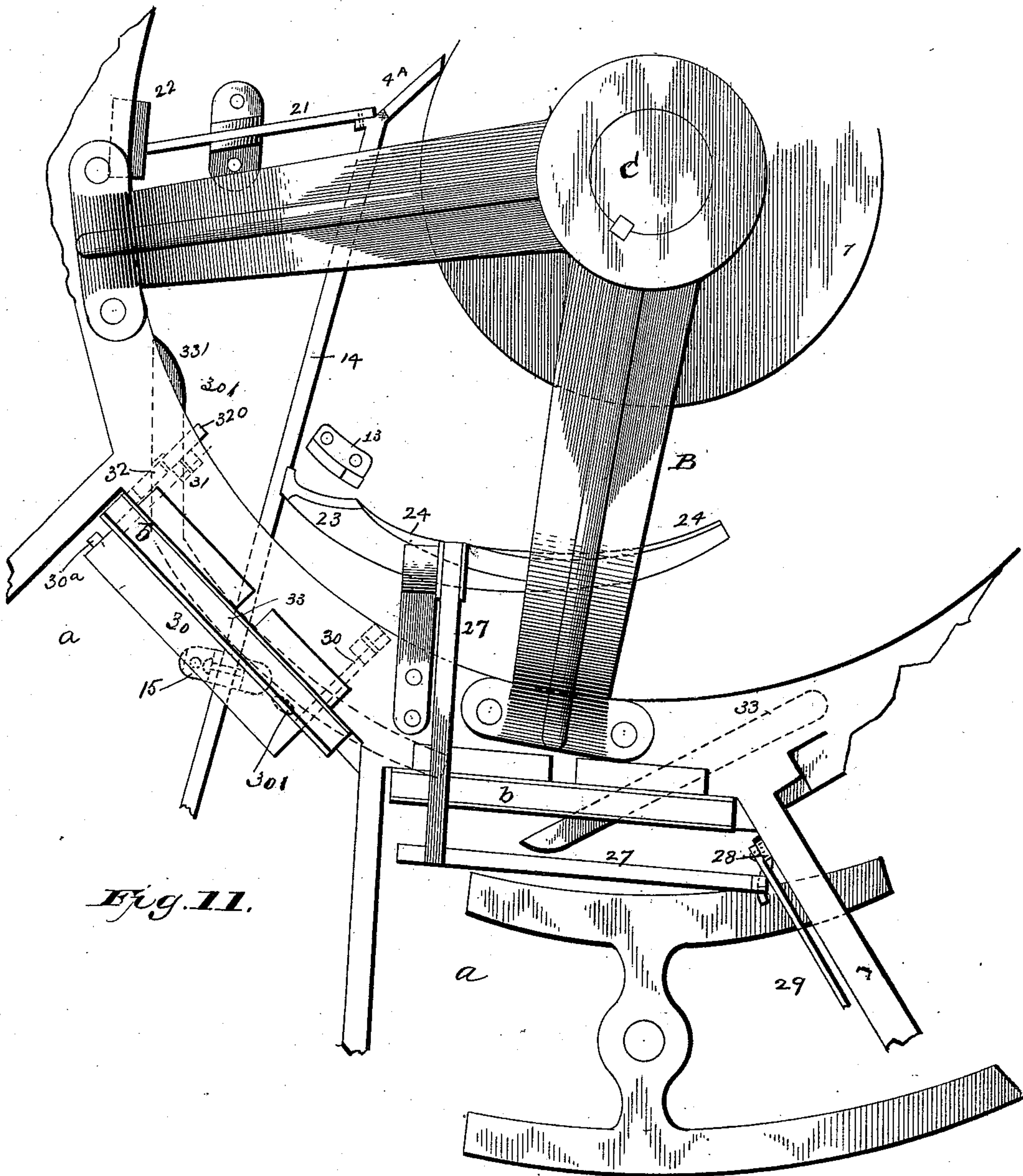
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Patented June 2, 1896.



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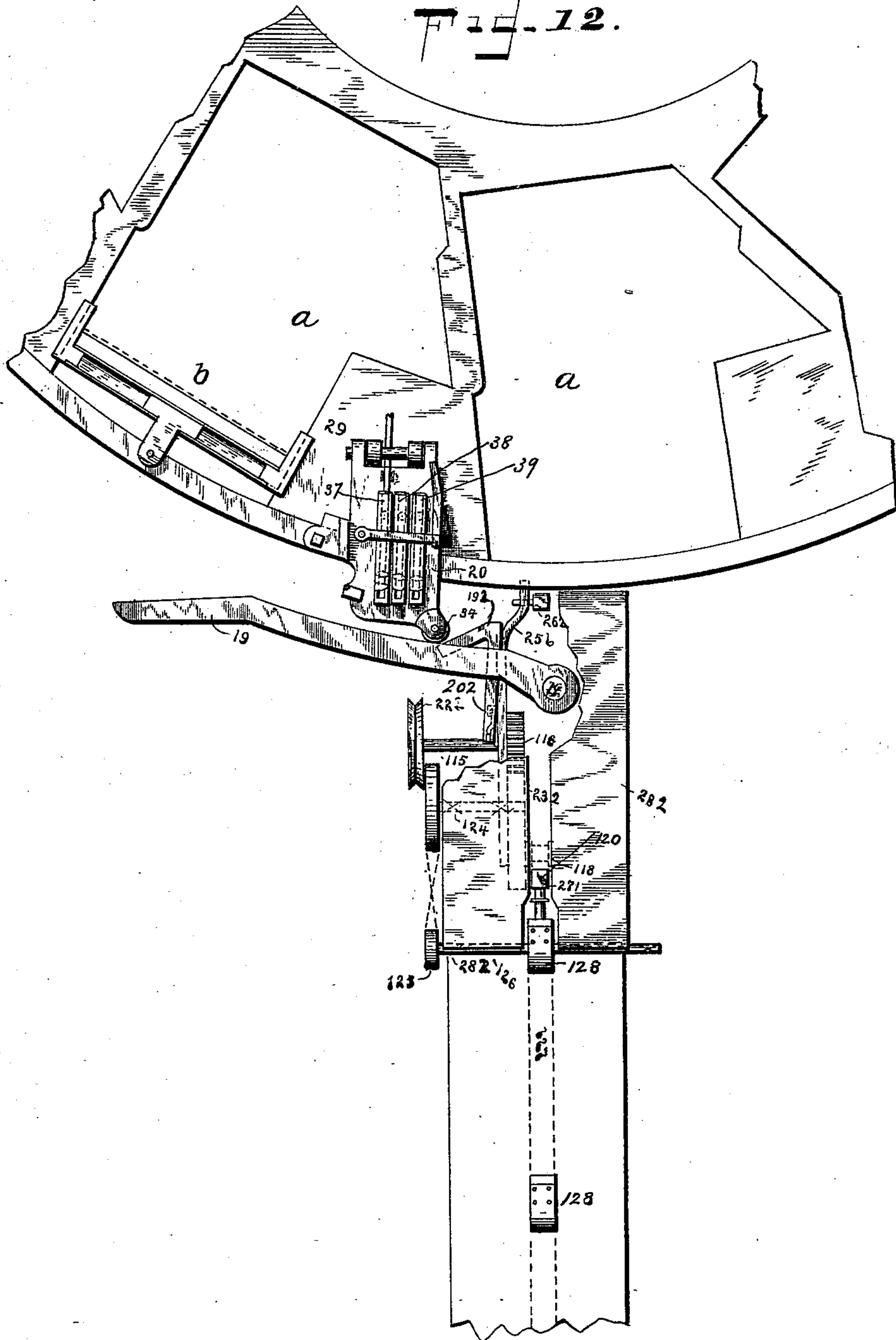
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Fig. 12.



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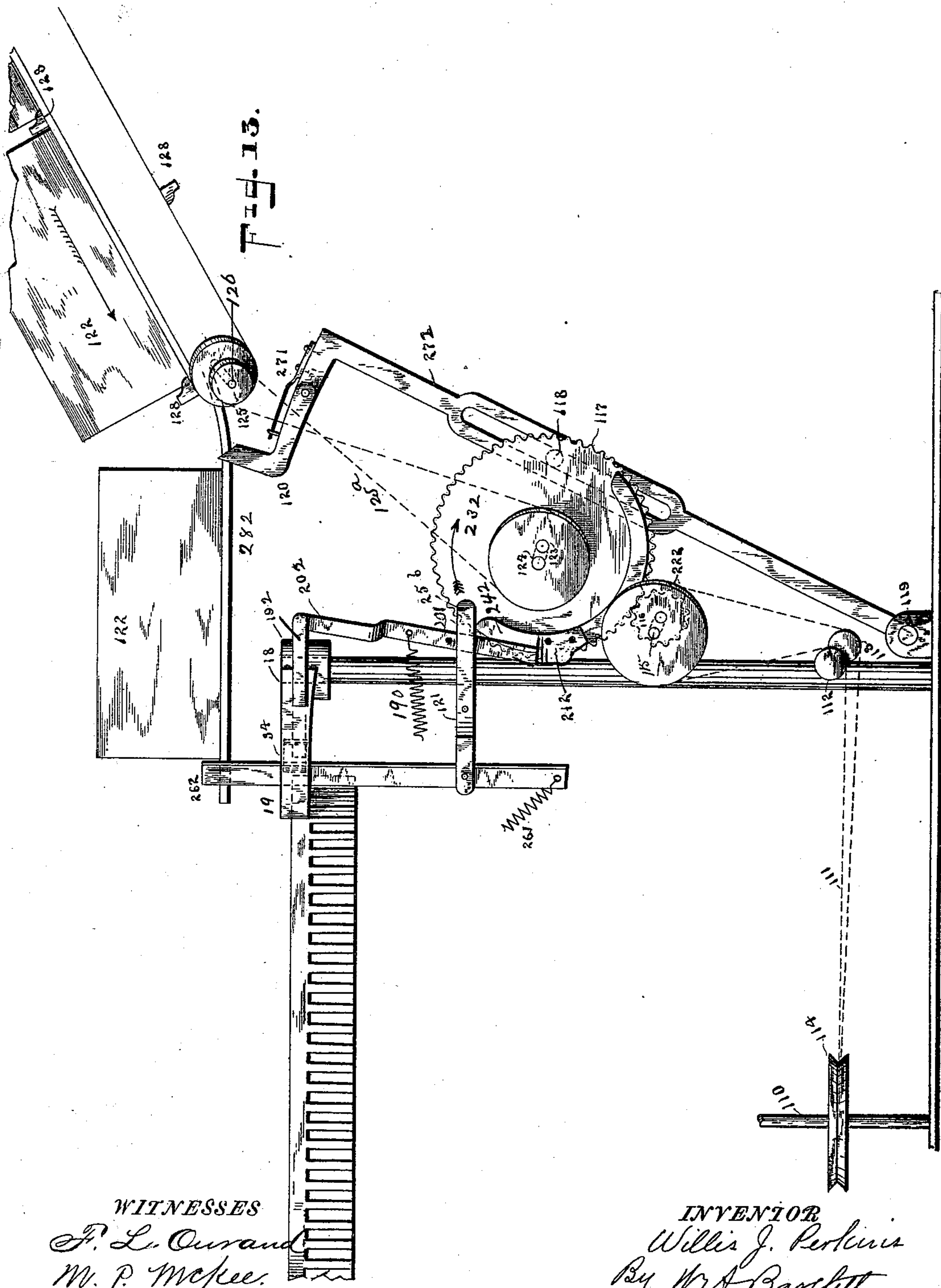
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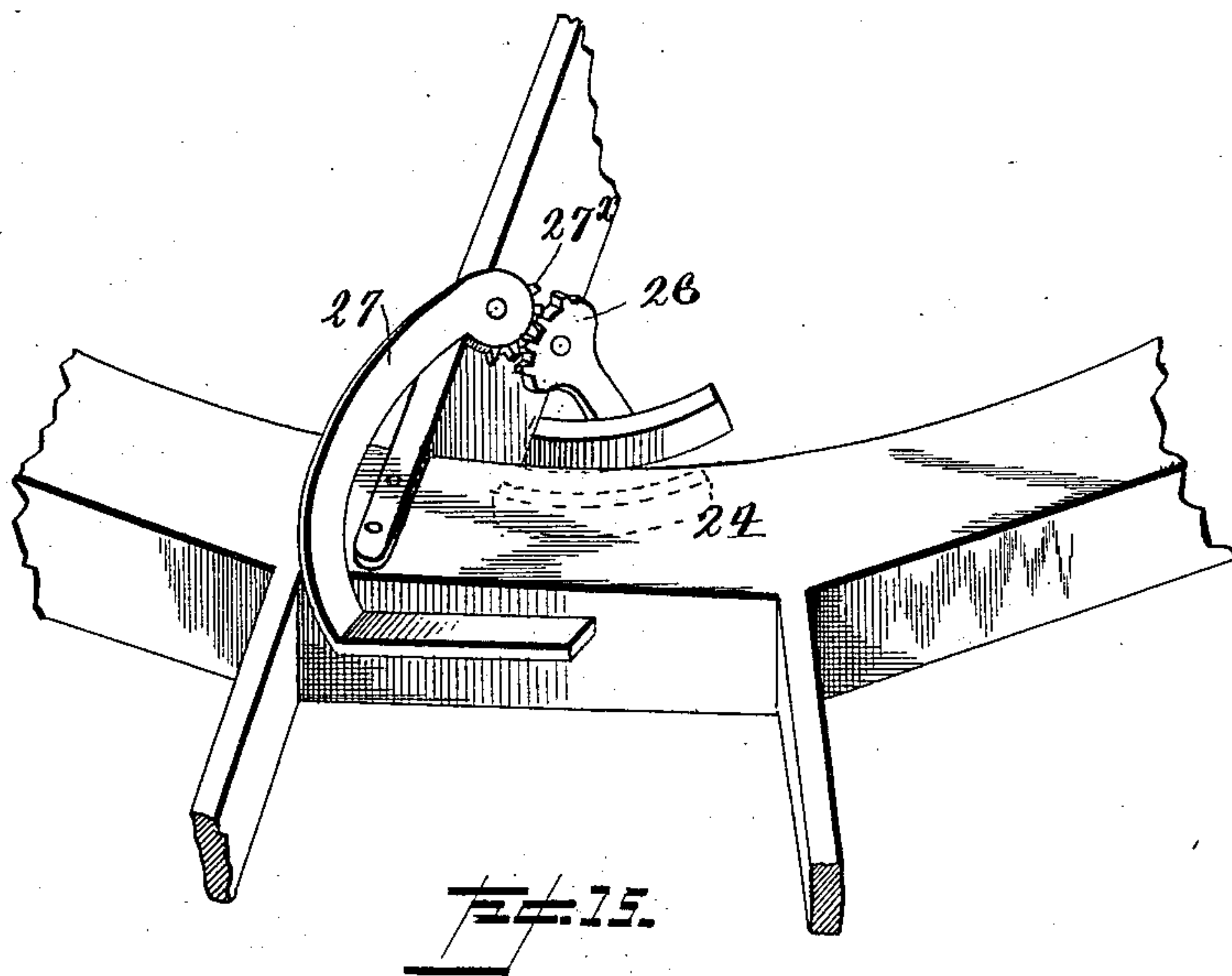
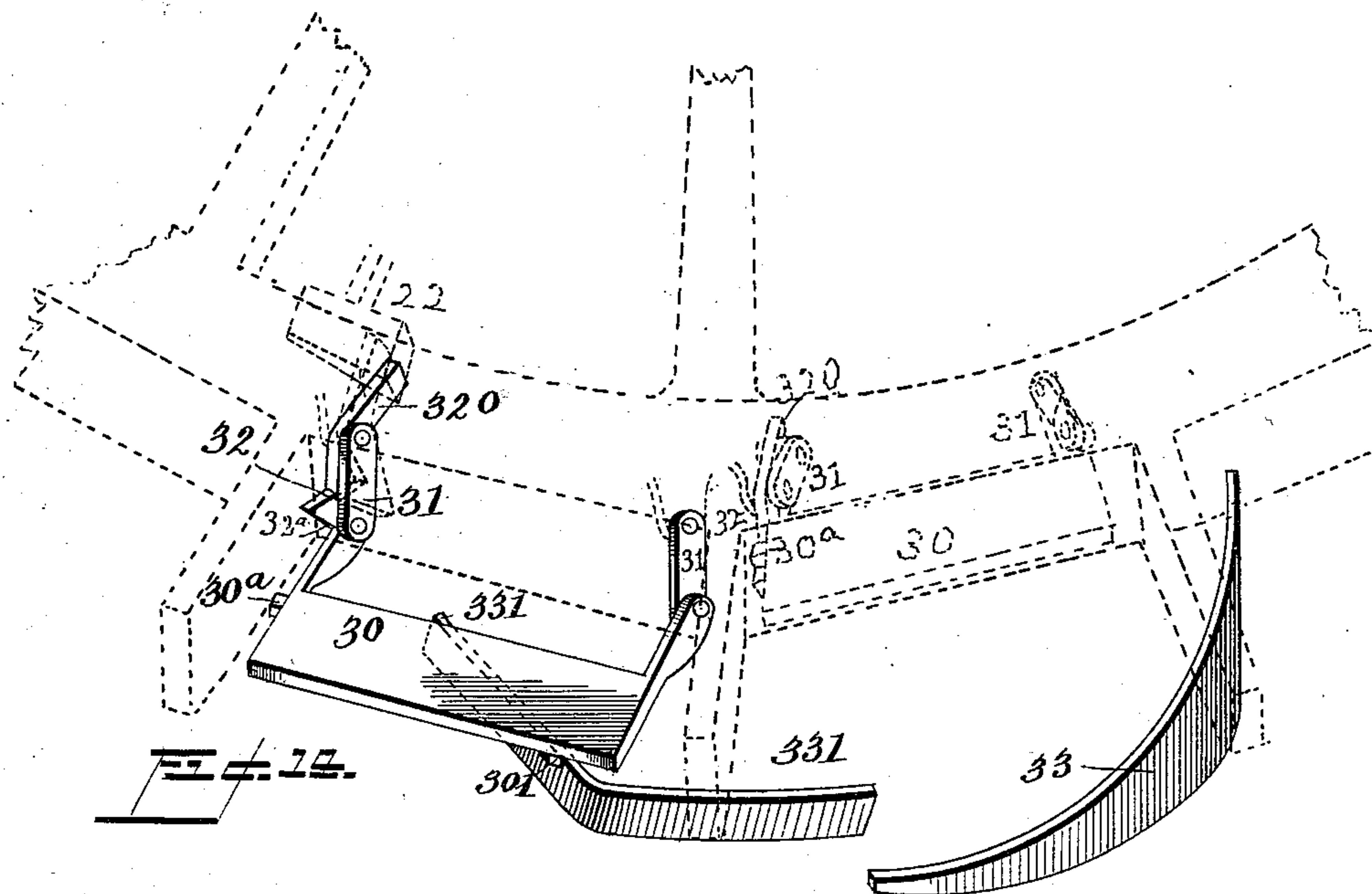
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Witnesses

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UNITED STATES PATENT OFFICE.

WILLIS J. PERKINS, OF GRAND RAPIDS, MICHIGAN.

SHINGLE-SAWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 561,279, dated June 2, 1896.

Application filed August 2, 1889. Serial No. 319,528. (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-machines in which a number of shingle blocks or bolts are carried by a continuously-moving carriage to a saw or plurality of saws, and a shingle is sawed from each block as it passes the saw.

The object of the present invention is to improve the construction of the block clamping and supporting devices; also to place the operating parts of the machine well under the control of the operator who by the adjustment of suitable stops or catches with reference to any of the bolt carriages or carriers can then depend on the machine to automatically complete the function for which said catch or stop was intended, as to throw out the spalt, feed in a new block or bolt, or perform other operations generally performed by hand.

In general the object of the invention is to produce a machine which shall be nearly self-operating or automatic when driven by a suitable motor.

Figure 1 is a partial plan of the improved shingle-machine, the blocking-shelf and many of the working parts being omitted. Fig. 2 is a side elevation, some parts being omitted. Fig. 3 is a detail section through center of one carriage, showing automatic spalter and other mechanism. Fig. 4 is a detail elevation showing a portion of the rotating carriage and tilt-operating arms. Fig. 4^a is a perspective of the lever 14 and connections. Fig. 5 is a broken top plan of the actuating-arm and trips. Fig. 6 is a broken elevation showing end of actuating-arm. Fig. 7 is a plan of stationary handles for operating the trips. Fig. 8 is an outer end elevation of same. Fig. 9 is a partial section of the rotary carriage, showing in elevation the handles and actuating-arm. Fig. 9^a is a detail elevation of handles, showing one handle depressed and another elevated. Fig. 10 is a perspective view of the end of the dogging-rod and catch for holding the same open.

Fig. 11 is an enlarged detail of part of Fig. 1, showing the operating connections of the bolt-supporting shelf. Fig. 12 is an enlarged broken detail plan, showing automatic bolt or block feeding devices. Fig. 13 is an elevation of the automatic bolt or block feeding device. Fig. 14 is a diagrammatic representation of the shelf-supporting and disengaging mechanism hereinafter referred to. Fig. 15 is a diagrammatic representation of the devices for raising the block or bolt follower.

The general arrangement of the rotary carriage, saws, and tilt-table is preferably such as is shown in my Patent No. 380,346, of April 3, 1888. It will be understood, however, that many of the improvements herein set forth may be used in other machines than the patented machine referred to.

A indicates the shingle-bolt carriage—in this case a rotary carriage—having ten (more or less) receptacles *a* for shingle-bolts. This carriage is preferably supported by spider B from the central shaft C, as has been done before in machines of this class, but may be otherwise made.

Each bolt receptacle or carrier *a* has a movable bolt-dog *b* and a stationary dog *c*. The movable dogs *b* slide in ways parallel with the rear or pushing faces of the carriage or bolt-receptacles. The dog is drawn inward by a sliding arm *d*, which rides in guides on the carriage A and is actuated by a spring G, which surrounds the arm and has a bearing on the frame and also on a nut *e* or boss on the bent arm *d*. The inner ends of the sliding arms *d* have bearing rolls or surfaces 3, which in a general way resemble those shown in my Patent No. 380,346, of April 3, 1888.

The rolls 3 engage cams or inclined surfaces 4, which are fixed relatively to the rotating carriage in such position as to bear against rolls 3 and press out the dogs *b* at the proper time in the rotation of the carriage.

The inner end of each arm *d* has a bracket 2, which bracket carries a roll 5, Fig. 10. The rolls 5 ride against inclined surfaces 6, carried by the ring 7 and take the strain of the parts when the rolls 3 encounter inclines 4 or 4^a. The ring 7 is attached to the central shaft C, which supports the rotating carriage.

Returning now to Fig. 10, the numeral 9 shows a hook or projection on the arm *d* or

bracket 2. A hook 10 is borne by a suitable pivot 8, supported on the carriage A in proximity to the inner end of the arm *d*. The hook 10 has a downwardly-projecting lug 12, which is in position to engage an incline 13 on the frame at a suitable point in the rotation of the carriage. As the lug 12 rides up incline 13 when carried along by the carriage movement it lifts the hook 10 out of engagement with projection 9, thus leaving arm *d* free to move under the influence of its spring; but when lug 12 is not in engagement with the incline 13 the hook 10 falls inside the projection 9, as roller 3 is forced outward by incline 4. Hook 10 thus holds the arm *d* pressed outward against the tension of its spring, relieving roller 3 from the friction which would arise if the incline 4 was continued for a long distance in an arc of the circle described by the rotation of the carriage, as has been done heretofore. The bearing or incline 4 is located on the frame in such position as to undog the bolt as it approaches the tilt-table.

The incline 4^A is carried by a lever 14, and may be integral with said lever. (See Figs. 2 and 4^A.) Lever 14 is pivoted to a support on the frame 15, and the outer end of the lever has contact with the cam 16, carried by arm 17 on the upright rock-shaft 18, suitably supported in the frame or support of the machine. The upper end of rock-shaft 18 bears an arm 19, which is engaged by the actuating-arm 20 on the carriage at proper intervals and under proper conditions. A lever 21 is pivoted to the inner end of lever 14 and suitably supported on the frame. The upturned end of this bell-crank lever 21 bears an incline 22. When the incline or abutment 4^A is raised into position to operate the dog, this incline 22 will be depressed, and vice versa. The arm 14 also carries an inclined abutment 23 and an arc piece 24 nearly concentric with the carriage. Each bolt-compartment of the carriage has a lever 27 (clearly shown in Figs. 3 and 11) pivoted to the carriage, with a bent arm extending over the shingle-bolt. The pivoted end of said arm or lever 27 has a segment-gear 27^x concentric with its pivot, and this gear engages with a mutilated gear 26, pivoted or journaled to the carriage and having a tooth or projection 25, which engages the arc 24 when the latter is elevated into engaging position in the act of ejecting the spalt from the machine and raises arm 27 to allow a new shingle-bolt to be placed in the carriage. A bell-crank lever 28, Figs. 3 and 11, is pivoted to the carriage at each bolt-compartment. One arm of this lever 28 is pivoted to a rod 29, which extends outwardly to the rim of the carriage adjacent to one of the trips in the actuating-arm 20, which will be described hereinafter. The front end of arm 27 extends above and across the inner end or face of the bolt-compartment, and when this arm 27 is depressed it bears on the free arm of bell-crank 28, thus thrusting the rod 29 outwardly. This only happens when

the arm 27 falls to its lowest position in following the bolt down while said bolt is being sawed into shingles.

It is desirable to remove the spalt when it is reduced in size to a certain thickness, and the arm 27 should descend far enough to rest on the thinnest spalt that it is safe to make on the machine, but not far enough to come in contact with the saw before actuating the spalt-expelling mechanism.

A block-supporting shelf 30 is shown in Figs. 3, 11, and 14 as arranged under the fixed dog at the inner end of the shingle-bolt carrier. The shelf is supported by links 31, pivoted to the carriage and to the shelf. A hook, catch, or rest 32, also pivoted to the carriage, drops under a projection, as 30^a, on said shelf whenever the shelf is lifted, so that this hook can engage therewith. The hook 32 has an incline 32^a and a weighted arm 320, which arm tends to throw it forward. When the shelf is lifted into position to engage the hook, it first engages the incline 32^a and swings the hook a little back, and, as shown, as the shelf passes the point of the hook the weighted arm causes the hook to swing forward and support the shelf. When held up by the hook 32, the shelf is back under the bar of the carriage, as in dotted position, Fig. 14, and is then inoperative. The object of the shelf is to support one end of the shingle-bolt at certain times and prevent it from twisting in the binding-dogs. To cause the shelf to so operate, suitable mechanism is provided as follows: There is a fixed bar 331 on the frame. This bar is for a part of its length curved circumferentially of the machine and for a part of its length is inclined to such curve, extending toward the center, as shown in dotted lines, Figs. 1 and 11 and in Fig. 14. When the incline 22 (connected, as heretofore described, to lever 14) is in its normal or elevated position, it will be engaged by the counterbalancing-arm 320 of hook 32 during the carriage movement, and hook 32 will thus be disengaged from the shelf. Being thus freed the shelf drops down on the bar 331. A downward projection 301 on the shelf is thus carried outside of the inclined part of bar 331, and as the shelf moves along with the carriage the shelf is swung outward until the projection thereon reaches the circumferential part of bar 331, when the shelf will move circumferentially, being supported at its outer edge by said bar. When so projected and supported, the edge of the shelf extends under the inner end of the shingle-bolt and will tend to prevent the twisting of said bolt in the dogs; but it is apparent that the shelf would be in the way of the saw if carried fully around the machine under the dogs, and would also interfere with the tilt of the block. Therefore the incline or abutment 33 is applied on the frame, and as the carriage moves forward some part of the shelf encounters said incline, and by said incline the shelf is pressed inward toward the center of the machine (the links

permitting considerable freedom of movement) and also lifted up until the hook 32 again engages the shelf and holds it back out of the way of the saw and in inoperative relation to the rest of the machine. When the incline 4^a carried by lever 14 is raised into position to operate the dog for dropping the spalt, the incline 22 is depressed and therefore cannot release hook 32 from the shelf 30, and consequently the shelf 30 remains hung up and inoperative and has nothing to do with the dropping of the spalt, as hereinafter described.

It will thus be seen that the bolt is never supported on a fixed way or track beneath the bolt-compartment at that point in the rotation of the carriage where it is desired to expel it from the machine, but that at certain times the inner end of the bolt may be supported by the movable shelf 30 I have described, and this will occur whenever the shelf is in operative position and the bolt slips or tips in the binding-dogs and at no other time. The shelf is held back by the hook 32 for the purpose of permitting the dropping the spalt, as described.

Bolt-supporting ways may be used between the back of the saw and tilt-table excepting at the point where the bolt or spalt is to be expelled.

An actuating-arm 20, Fig. 5, is pivoted at 35 to the carriage A, opposite each bolt-compartment *a*. Each arm 20 carries three (more or less) sliding stops 37, 38, and 39, and each stop has a pin 40, 41, and 42, extending upward into position to engage the lever 36 and push said lever off the lug 101 when either slide is drawn outward.

All the slides move in slideways on the arm 20. Slide 37 is moved outward by rod 29, hereinbefore mentioned, which rod is pressed outward by the bell-crank lever 28 whenever the arm 27 shall have fallen far enough to move this lever 28 through the connections described.

Arm 20 is shown in Fig. 9 as elevated at its outer end above the rim of the carriage and in Fig. 3 as resting on said rim. The bar 36 is pivoted to the arm 20 and extends across said arm, passing under a hook or bracket 102 on said arm and resting normally on the lug 101, being pressed in this direction by a spring 100^a, Fig. 5. When pulled off from this lug 101, the bar 36 permits arm 20 to fall down, as in Fig. 3.

Assuming arm 20 to be in its elevated position, Fig. 9, when rod 29 pushes the slide 37 outward, the slide is then in position to cause its downwardly-projecting lug or abutment 52 to be caught by the incline 57, Fig. 1, which stands on the frame outside the rotary carriage. The incline 57 thus acts to pull said slide still farther out. The pin 40, carried by slide 37, throws arm 36 off from lug or stud 101, permitting arm 20 to fall

down onto the carriage-rim, as in Figs. 3 and 6.

When arm 20 is in its lowered position, the roller or abutment 34, carried by said arm, is in a plane to engage arm 19 on rock-shaft 18, thus operating lever 14, depressing the outer end of said lever, and raising the incline 4^a, so that the roll on the inner end of the dog-rod engages said incline 4^a, opening or disengaging the dog and dropping the bolt or spalt. At the same time the incline 22 is depressed, which leaves the shelf-holding hook 32 in engagement with the shelf 30 to hold the shelf from falling back under the spalt or bolt. The block or spalt being thus unsupported must fall. Arm 20 and its connections thus serve as a trip to actuate the movable piece 19 when said arm 20 is in its dropped or abnormal position. Movable piece 19 in turn actuates lever 14, through the rock-shaft 18 and arm 16, and this lever 14 moves the movable part 4^a into position to open the dog and drop the spalt. This happens whenever the slide 37 is actuated, as above described, and as hereinafter explained the slide 37 is under control of the arm or handle 46, which is manipulated in one direction by the operator, or, as further explained, the arm 46 may be held by handle 60 to operate on all the trips 37 of the carriage and work the dogs to drop all the spalts.

As hereinafter explained, all the arms 20 are returned to normal position at incline 106 on the other side of the machine from the operator.

The arc 24, carried by lever 14, is in the path of travel of the projection or tooth 25 of the mutilated gear 26, and when this arc 24 is thrown up by the movement of the lever 14 the projection 25 will engage said arc and the engagement will cause the lifting of arm 27 to position to permit the insertion of another shingle-bolt in the carriage-compartment under said arm 27.

Each slide 37 38 39 (carried by arm 20) is provided with an upwardly-projecting inclined surface 43 44 45 near its outer end, the incline being at an angle to the path of movement of the slide in the carriage. They are also provided, respectively, with the downwardly-projecting lugs 52, 53, and 54, the lower ends of these lugs being in different horizontal planes.

A standard 70, outside the carriage and suitably connected to the frame, supports an arm 71, which is about tangential to the carriage. This arm 71 has three handles 46, 47, and 48 pivoted thereto. The handles 46, 47, and 48 have downwardly-projecting inclines 49, 50, and 51.

It will be observed that the inclines 49, 50, and 51 are not at the same distance from the center of the carriage and that the corresponding inclines 43 44 45 are in similar relative arrangement. Consequently the handles do

not interfere with each other. When one of the handles, say 46, is pressed down by the operator, its incline 49 catches the incline 43 of slide 37 and draws out said slide as the carriage rotates.

Arms 80 and 81, duplicated on opposite sides of the machine, Figs. 1 and 2, and outside the rim of the carriage, are rigidly attached to rock-shafts 82 and 83, which are connected by a suitable gearing or links to move together in opposite directions. The arms 80 and 81 are in different planes, so that the roller or abutment 34, in different positions, may engage one or the other and by rocking the arm outwardly swing the rock-shafts 82 and 83. Shaft 82 has an arm 84, which works a pitman or connecting-rod 85, leading to the operating mechanism of the tilt-table. The pitman 85 connects with lever 86, fulcrumed on the upright standard of the frame. The other end of lever 86 comes between push-lugs 87 87 on bar 87^a. Bar 87^a is connected to the joints of the toggle-links 88 89, one toggle being at each side of the standard. The toggle-links are pivoted at their upper ends to the rockers 90 90, which in turn supports risers 91 91 at the sides of the tilt-table 99, in the general manner shown in my Patent No. 380,346, of April 3, 1888, and in application, Serial No. 308,150, filed April 21, 1889. Arm 20 when in normal position acts on arm 80 and returns tilt-table to its normal inclination.

The general arrangement of the saws, carriages, and tilt-tables is similar to that shown and described in said Patent No. 380,346. The automatic features resemble those described in said application.

The tilt-tables operate to drop one or the other end of the shingle-bolt, so that it may be below the level of the saw, as in my patent last referred to.

It will be understood that one of the handles, as 47, serves to draw out a slide, as 38, which slide serves to adjust the height of the outer end of the arm 20 to work one tilt-table, and another handle, as 48, may be similarly adjusted to operate its train of connection to set the other tilt-table, while the arm 46 may be used to work the spalt-dropper instead of using the automatic spalt-dropper hereinbefore described. Incline 59 on arm 20 acts alike on the handles 46, 47, and 48, raising them to their normal position. Springs 61^a, fastened to handles 46, 47, and 48, catch over suitable projections on standard 70 and retain said handles in normal position. Handle 60 is journaled in a boss on standard 70 and has an eccentric on the outer end of said journal adapted to raise spring 61^a on the handle 46 off its locking-lug.

When it is desired to throw out the spalts from the several carriages, handle 60 is adjusted, thereby preventing handle 46 from being held up, and allowing it to work on all of the bolt-compartments, as heretofore described, as fast as they approach it.

55, Fig. 1, is an incline having its angle away from the carriage-wheel and being on a plane suitable to engage with depending lug 54 on slide 39, Fig. 6.

103 is an incline on the frame adapted to raise arm 20 to its normal position. Spring 100^a then acts on lever 36, drawing same over lug 101, thereby retaining arm 20 in elevated position. Incline 104 on frame or saw-guard is adapted to engage with lug 54, pushing same inwardly into normal position. Incline 105 is adapted to engage with depending lug 53 and draw out slide 38 for the purpose of operating the second tilt. Incline 106 is adapted to elevate arm 20 into normal position at the other side of the machine, while incline 107 is adapted to engage with depending lug 53, replacing same in normal position. Incline 57 is adapted to engage with depending lug 52, drawing slide outwardly. Incline 108, Fig. 1, is adapted to elevate arm 20 into normal position, while incline 109 acts on depending lug 52 and returns slide 37 into normal position.

The bolts or blocks to be sawed into shingles are carried automatically to this machine by mechanism now about to be described.

Referring to Figs. 1, 12, and 13, the numeral 110 (see Fig. 13) indicates a feed-shaft, around which an endless belt 111 passes. The belt then passes over idlers 112 and 113 to a driving-pulley 222 of shaft 115, which shaft is suitably supported on the frame of the machine. The shaft 115 carries a gear 116, which meshes with a gear 232. This gear 232 carries a crank or wrist pin 118. A slotted arm 272 is pivoted to the frame, as at 119, and the wrist-pin 118 enters the slot in this arm, causing the arm to rock on its pivot with the rotation of gear 232. The arm 272 has a pusher 120 pivoted to its upper end, the end of said arm being supported by a spring 271. The toe of this pusher 120 passes through a slot or opening in the supporting-platform 282, which platform is close along the side of the rotary carriage of the machine and a little above the top thereof. A perpendicular arm or stop 262 extends up through the slot in platform 282, near the carriage, and when elevated serves as an abutment to prevent the bolts from being pressed onto the carriage. This stop is held up by a spring 261. A lever 121 is pivoted to the frame and also pivoted at one end to the stop 262. The free end of this lever 121 extends over a cam or bearing-piece 242 on the gear 232, and when the gear-wheel 232 rotates it lifts the free end of the lever and forces down the stop 262. The belt will move all the time, but will slip on its pulleys when the parts are locked, as will be described, or in place of this slipping friction movement I may substitute a positive motion with a dwell. A stop or catch 202 is pivoted to or near the frame or a support thereon, as at 201, in such position that the lower end of said catch rests on a projection 212 on the gear 232 and prevents the rotation of said gear save when the

catch is swung to one side. A spring 190 holds this catch in locking position save when the catch is swung aside by outward movement of arm 192, which arm is connected to the catch.

5 This arm 192 is pressed out by the roll or abutment on arm 20 engaging said arm 192 directly after it has operated arm 19 to drop a spalt. Arm 192, being pressed out, swings catch 202 so as to permit the gear 232 to rotate to the extent of one revolution. The starting of the gear draws down abutment or stop 262 and swings the arm 272 so as to carry the pusher 120 inward toward the saw-carriage, forcing a shingle-bolt 122 before it. 10 The bolt drops onto the supporting parts in position to be grasped by the dogs. A belt 125^a leads from a pulley 123 on the shaft of gear 232 to the driving-pulley 125 of an endless conveyer. Shingle-bolts 122 are brought forward by the flights 128 of this conveyer to replace the one taken from the table 282. The bars or flights 128 serve to separate the bolts and hold them in proper position for feeding and also to force the bolts forward in 20 position to be caught by the pusher 120. The spring 271 permits the pushing-dog 120 to slide under the advancing shingle-bolt as said dog moves backward. The lower ends of depending lugs 52, 53, and 54 are in different planes and are acted upon by inclines 55, 103, 30 104, 105, 106, 107, 57, 108, and 109, which are also in different planes adapting them to act upon the lugs, as heretofore described.

From the foregoing it will be seen that I 35 provide absolutely automatic or self-operating devices for feeding the bolts into the machine and dropping the spalts from the same when the shingles have been cut away so as to leave only the spalt, and at the same time 40 I have provided mechanism by which the spalts or blocks may be readily dropped when the operator sets a proper trip for the purpose.

It will also be seen that the tilt-tables are placed under the control of appropriate trips 45 which operate once and are then restored to normal position. The operator has merely to depress the proper trips or handles and the machine does all the rest. No muscular exertion being required from the operator he 50 is at liberty to watch closely the working of the machine and can set the tilts to keep the shingles as near as possible with the grain of the wood and the spalter to throw out any imperfect block with great convenience, safety, 55 and celerity.

This machine has general features in common with my patented machine, for which Patent No. 380,346 was granted April 3, 1888, and has also some features resembling those 60 of my application, Serial No. 308,150, filed April 21, 1889; but the differences are material, and are intended to be specifically pointed out in the respective claims.

I do not desire to be limited to the precise 65 construction of mechanism pointed out in many of the combinations, as it is quite apparent that equivalents may be substituted.

Without enumerating specifically all the elements it will be understood that the "bolt-follower" indicates generally the arm extending over the position of the bolt in the carriage and such of its operative connections as are necessary to restore said arm to position above the bolt after the arm has once followed the bolt down until only the spalt remains. 70 It will also be understood that the term "spalter" refers generally to such mechanism as is used to drop the spalt or waste from the carriage; that the terms "incline," "abutment," or "bearing" refer to those parts 75 which, by the engagement of one with the other, cause a shifting of position of some movable part, and that where it is stated that an incline is placed on the frame for a certain purpose, as to engage an arm or slide on the 80 carriage, it will be known to mechanics that the incline may be on the arm or slide, and the so-called "incline" may be a mere abutment, bearing-piece, or stop, and that the term "lever" may apply equally as well to an arm 85 or rock-shaft. 90

The connection of the spalter with the automatic feeder renders the machine practically self-operative, since the follower actuates the automatic spalter and the spalter 95 actuates a train of mechanism to put the feeder in operation and thus to throw a new block into the machine.

The terms "feeder" or "carrier" are applied to the mechanism for feeding the bolts 100 to the carriage or dogs. The general features of an endless-chain carrier or elevator are embraced in this feeder, but some special adaptations are made to the uses of a shingle-machine, and the device is so connected as 105 to adapt its movements to the requirements of the saw, feeding in a bolt only when a spalt has been thrown out, be the time-interval greater or less.

It will be understood that changes of construction by the substitution of known mechanical equivalents may be made without departing from the spirit of my invention. 110

In my application, Serial No. 308,150, filed April 21, 1889, I claim, broadly, certain combinations of the movable arm or actuator in its relation to the carriage. The constructions in said application are in some respects like those of the present application, and in other respects they are different. A careful 115 consideration of the claims in said application, which it is hoped may be patented of even date herewith, is invited. 120

What I claim is—

1. In a shingle-machine, a moving carriage, 125 a movable dog connected to said carriage, a bearing-piece against which the dog bears in the movement of the carriage, and a locking-catch engaging said dog to hold it open independently of the bearing, all combined 130 substantially as described.

2. In a shingle-machine, the moving carriage, a movable dog on the carriage, a fixed bearing in the path of movement of the dog

to open the same, and a hook engaging the dog to hold it open, in combination as stated.

3. In a shingle-machine, a carriage, a locking-dog on said carriage, said dog having a shoulder thereon, a hook to engage said shoulder, and an abutment on the frame in position to detach the hook in the movement of the carriage, all combined substantially as described.

4. In a shingle-machine, the moving carriage, the sliding dog on said carriage having a shoulder thereon, the hook engaging said shoulder, an inclined abutment on the frame, and a projection on the hook in position to engage said abutment, all in combination substantially as described.

5. In a shingle-machine, a moving carriage, a movable dog thereon, a push-rod acting with said dog, and carrying an antifriction-roll, an incline on the frame engaging said roll to unlock the dog, and a guiding or steadying roll on the rod having a bearing on the frame, all combined substantially as described.

6. In a shingle-machine, a follower resting on the block, a trip actuated by said follower, and a spalter connected to said trip to drop the spalts, the combination operating substantially as described.

7. In a shingle-machine, a carriage, a block or bolt follower in position to rest on a bolt on said carriage, a movable arm on the carriage connected to the bolt-follower and actuated thereby, and mechanism connected to said arm for releasing the spalt from the carriage, all combined substantially as described.

8. In a shingle-machine, a movable block-support attached to the carriage, a rest retaining said support under the bolt when the support is in operative position, and a catch engaging the support to hold it away from the saw when out of operative position, combined substantially as described.

9. In a shingle-machine, a movable block-support under the bolt-carrier and connected thereto, pivoted links sustaining said block-support, and a catch which supports said block-support out of operative position, in combination as set forth.

10. The combination, with the carriage, of the movable block-support, the hook supporting said block-support out of operative position, an adjustable abutment in position to disengage said hook, and supports on the frame for the movable block-support, all substantially as described.

11. The combination, with the carriage, of the movable block-support, a catch for holding said support away from under the dogs, a trip for said catch, and a movable arm or lever to actuate said trip, substantially as described.

12. The movable carriage, a bolt-follower on the carriage, an actuating-rod in position to be moved by said follower when the bolt has been cut down so that merely a spalt remains of predetermined thickness, an arm on the

carriage actuated by said rod, and a movable incline on the frame, actuated by the carriage-arm, to serve as an undogging abutment, substantially as described.

13. A lever on the frame having an incline, and a projection connected with the bolt-follower in position to engage said incline, whereby the bolt-follower is thrown back by the carriage movement when the incline in the lever is shifted into position to engage the bolt-follower, in combination substantially as described.

14. A lever on the frame having an incline, a mutilated gear on the carriage in position to engage this incline when the incline is in operative position, and an arm or bolt-follower on the carriage extending over the position of the shingle-bolt in the carriage, all in combination as set forth.

15. A bent arm or bolt-follower pivoted to the carriage and extending over the position of the bolt therein, a mutilated gear on the carriage engaging the bent arm, a movable abutment-piece on the frame in position to be engaged by the gear and thus lift the arm when the abutment-piece is in engaging position, and a lever and rod on the carriage engaged by the arm as the latter falls in following a shingle-bolt, all substantially as described.

16. The combination with the rotary carriage of the movable bolt-support or shelf and the compound lever on the frame, one arm of the lever having an abutment or bearing by which the shelf is dropped into operative position, the other arm of the lever having an undogging-abutment which is inoperative when the shelf or bolt-support is operative, substantially as described.

17. The rotary carriage, the movable shelf or bolt-support thereon, the shelf releasing and supporting abutments on the frame, a lever by which the shelf or bolt-support is made to move, said lever having attachments by which the dog is operated, and a bolt-follower also engaging said lever to throw back said follower, all combined substantially as stated.

18. The traveling carriage, an arm on said carriage, operative adjunctive mechanism controlling the relation of block and machine movable stops in said arm in position to engage the support thereof, and stops on the frame in position to engage said movable stops under certain conditions, in combination as stated.

19. The combination with the carriage provided with a movable dog, mechanism arranged to shift the dog at a proper position to drop the spalt, and a trip which is movable into abnormal position to actuate the dog-shifting mechanism, so as to drop the spalt, substantially as described.

20. In a shingle-sawing machine, the combination of a rotary carriage having a number of bolt-receptacles each provided with a movable dog, mechanism arranged to shift

said dogs at the proper point in the rotation of the carriage for dropping the spalts, a movable part arranged to set said mechanism in operation, and a trip for each bolt-receptacle of the carriage, and movable into abnormal position so as to actuate said movable part and put the dog-shifting mechanism into operation to drop the spalt, substantially as described.

21. The combination with the rotary carriage of the projecting arm, trips carried by said arm, a bolt-follower and rod actuated thereby engaging one of the trips, and a cam on the frame having connections as described to operate the spalter when the follower shifts the trips, substantially as described.

22. The combination with the rotary carriage of an arm pivoted thereto, a movable support for said arm, a series of trips in the arm in position to engage the support, inclines on the frame in position to engage said trips in their passage, and adjunctive mechanism operated thereby and controlling the relations of the bolts and machine, substantially as described.

23. The combination with the rotary carriage of an arm pivoted thereto, operative adjunctive mechanism controlling the relation of block and machine, a hook on said arm, a bar pivoted to the arm in position to support one end of said arm by passing under the hook, a spring tending to press said bar under the hook, and an abutment or projection on which said bar rests in sustaining the hook and arm, all substantially as described.

24. In a shingle-sawing machine the combination of a rotary carriage having a number of bolt-receptacles, each provided with a movable dog and having a trip for each receptacle movable into abnormal position, dog-shifting mechanism, a movable part connected with the dog-shifting mechanism and arranged to be engaged by said trips when the latter are in abnormal position, and a device to automatically return said trips to their normal position when they have acted on said movable part, substantially as described.

25. In a shingle-sawing machine, the combination with the carriage having shingle-bolt receptacles provided with movable dogs, of mechanism arranged for opening said dogs automatically for dropping the spalts, and means under control of the operator for setting said mechanism in motion, substantially as described.

26. The carriage having arm 20 provided with trips or slides, and operative adjunctive mechanism controlling the relation of block and machine, the supporting-bar in position to be engaged by said trips, and the series of handles on the frame having stops in position to engage the trips on arm 20.

27. In a shingle-sawing machine, the combination with the carriage having shingle-bolt receptacles with movable dogs, of mechanism arranged to open said dogs at the proper position for discharging spalts, and trips on the

carriage by which the dog-shifting mechanism is set in operation at the will of the operator to discharge any block or spalt, substantially as described.

28. The combination of the automatic tilt-shifting mechanism, substantially as described, and a tilt-table consisting of a pivotally-supported standard, risers at each side thereof, and a toggle-lever supporting the tilt-table at either side thereof, substantially as described.

29. The combination of a pivoted tilt-table, risers under each side thereof, a toggle-lever under each riser, and a crank connection to the toggle-lever whereby the same may be shifted.

30. A pivoted tilt-table, a riser under each side thereof, a toggle-lever under each riser, and a swinging lever operatively connected to the toggle-levers, whereby one toggle-lever is flexed as the other is straightened, substantially as described.

31. The combination of the rotary carriage, an operating-arm thereon, a pair of rock-shafts connected together and having inclines or arms at different levels in position to be engaged by said arm on the carriage, a pitman connecting said rock-shafts to the tilt-table, and a tilt-table supported by two sets of toggles, one set being straightened and the other flexed by the rocking of said shafts, substantially as described.

32. The combination of the rock-shafts connected to the tilt-table as described, the rotary carriage having an arm in position to operate said shafts, a handle adapted to engage said arm to start the movement, and a stop on the frame to engage said arm and move it into position to operate one of said rock-shafts, substantially as described.

33. The combination of the tilt and its rock-shaft and connections, the moving carriage having an arm as described, the handle on the frame engaging said arm to give the initiatory movement, a stop on the frame to complete the movement, and a second stop to positively restore said arm to inoperative position, all substantially as described.

34. The combination with the traveling carriage, of a shingle-bolt feeder, and trips connected with the carriage in position to engage the feeder and by which the feeder is thrown into operation automatically as the carriage moves forward when a bolt-receptacle in the carriage is empty, substantially as described.

35. In a shingle-machine, a moving carriage, a train of feed-wheels operated by a continuously-moving belt to drive a block-feeder, and a holding-catch serving to detain the feed-train until thrown out by action of the carriage, when the feed-train becomes operative, substantially as described.

36. In a shingle-machine, a rotary carriage, suitable shingle-sawing mechanism substantially as described, a feeder having a driving-train and a lock therefor, and a movable piece in position to engage the driving-train and

throw the same into operation, substantially as described.

37. The combination with the carriage of a shingle-sawing machine, of a catch or stop operated by said carriage, a continuously-driven belt and train of driving-gear, a pusher attached to said driving-train, and a block-stop actuated from the driving-train so as to be withdrawn when the bolt-pusher is pressed forward.

38. The combination with the carriage of a shingle-machine, of a driving-train, a movable piece on the carriage in position to throw this train into operation, a block-stop in the path of movement of the block, and a block-carrier connected to the driving-train, substantially as described.

39. The combination with the movable carriage of a shingle-machine, of a mechanical block-feeder, and intermediate adjunctive connections substantially as described whereby the feeder is thrown into operation from the carriage at proper times, substantially as described.

40. The combination with the carriage, of a spalter operated to automatically throw out the spalt, and a block-carrier operated from the carriage to feed in a new block when the spalt is thrown out, and the necessary cooperating adjuncts, substantially as set forth.

41. The combination, with the carriage, of a driving-train, an arm pivoted near the bottom of the frame and connected to a wrist-pin on said train, a pushing-pawl pivoted to the top of said arm, and a slotted platform in proximity to the carriage through which the pusher projects, all substantially as stated.

42. The combination with the carriage of the slotted pushing-arm and its driving-train, the pusher on said arm, the slotted platform through which said pusher projects, the stop-bolt projecting above said platform, and a feeder serving to press a block forward when permitted by said stop-bolt, all substantially as described.

43. The feeding-platform and pusher, the driving-wheel operating said pusher, the sliding block-stop, and a lever connected to said block-stop and in position to be actuated by the driving-wheel at the same time the pusher is set in motion, all being combined and operated substantially as described.

44. The pusher and its driving-wheel, a driving connection from said driving-wheel, and an endless block-carrier actuated by said

connection when the pusher-driving wheel is in operation, substantially as described.

45. The rotary carriage, a movable arm thereon, a pusher-driving wheel and a stop therefor in position to be thrown out of engagement by the arm on the carriage, and a bolt-carrier connected to and operated by said pusher-driving wheel, all being combined substantially as and for the purpose specified.

46. The combination with the traveling carriage, of a vertically-adjustable arm having a plurality of trips thereon, means for supporting said arm in normal and in abnormal position, and stops in the path of movement of said trips, independent of the carriage, and arranged in different planes, substantially as described.

47. The traveling carriage having vertically-adjustable arm moving therewith, and means for supporting said arm at different heights to operate on the different adjunctive parts of the machine, a series of stops outside the carriage in different planes to operate on the respective trips, and means for holding either of said stops in operative or in inoperative position, substantially as described.

48. In a shingle-machine a movable carriage, a movable dog therein, a push-rod acting with said dog, a fixed bar in the path of said push-rod adapted to open said dog, and a hook or stud engaging said push-rod or parts connected thereto to hold the dog open, all substantially as described.

49. In a shingle-sawing machine, the rotary carriage, an arm connected to the carriage for operating the spalt-dropper, a handle outside the carriage movable into position to engage said arm, and a spring operating on said handle to hold it in any one of several positions, to secure desired action on the arm, all combined substantially as described.

50. In a shingle-machine, having a plurality of bolt-holding carriages, an arm movable with the carriage, trips on said arm, a series of handles in the path of movement of said arm, and a stop acting to return the trips on said arm to normal position, all combined substantially as described.

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

WILLIS J. PERKINS.

Witnesses:

HUGH E. WILSON,
EDMOND TAGGART.