No. 778,258. PATENTED DEC. 27, 1904.

W. E. MARTIN.

MACHINE FOR MAKING RAILROAD CROSS TIES.

APPLICATION FILED DEC. 18, 1903.

7 SHEETS—SHEET 1.

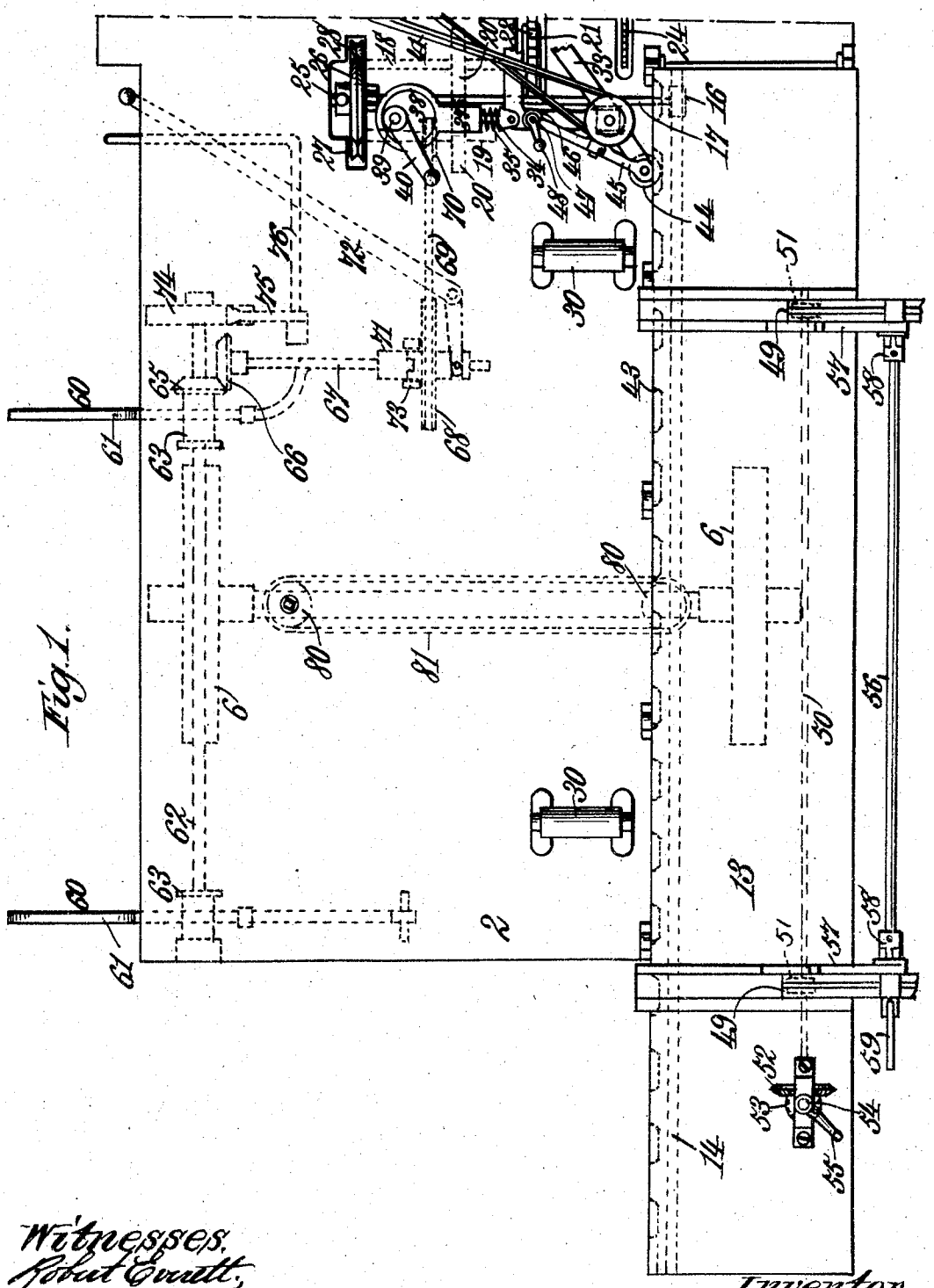

Fig. 1.

Witnesses.
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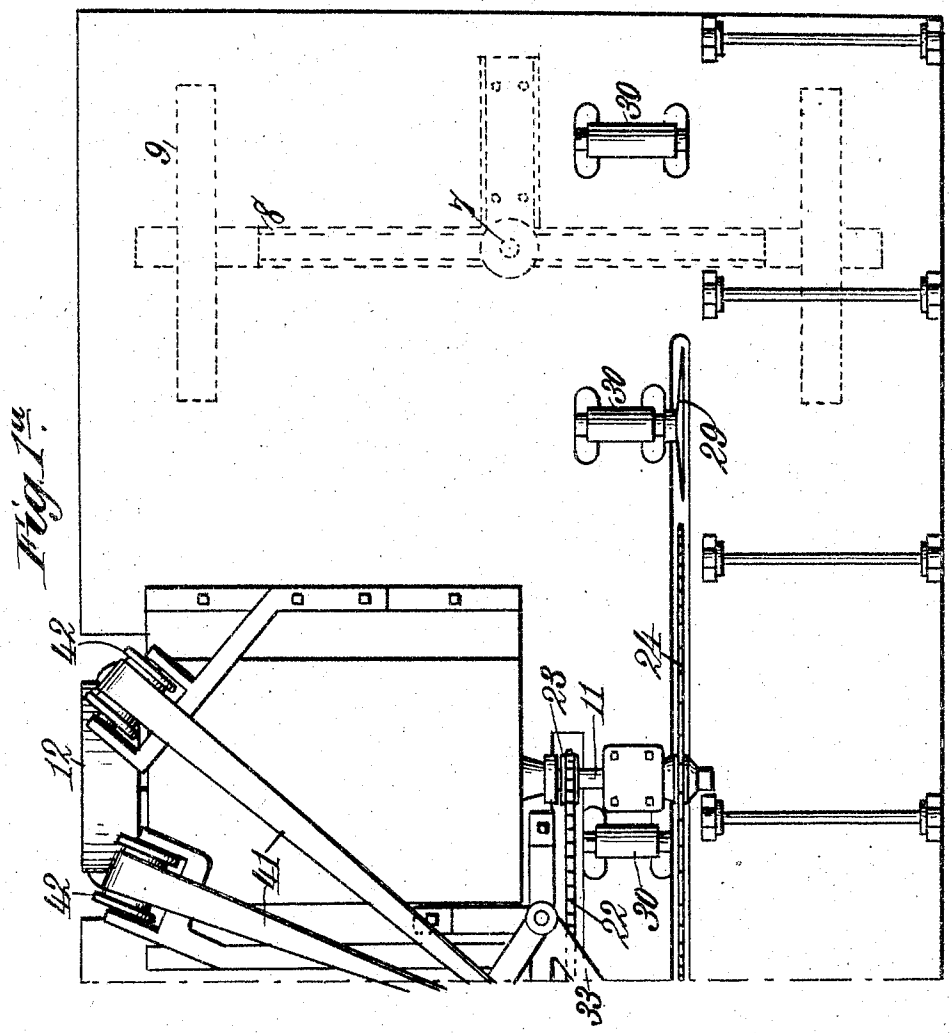
7 SHEETS—SHEET 2.

Fig. 1.



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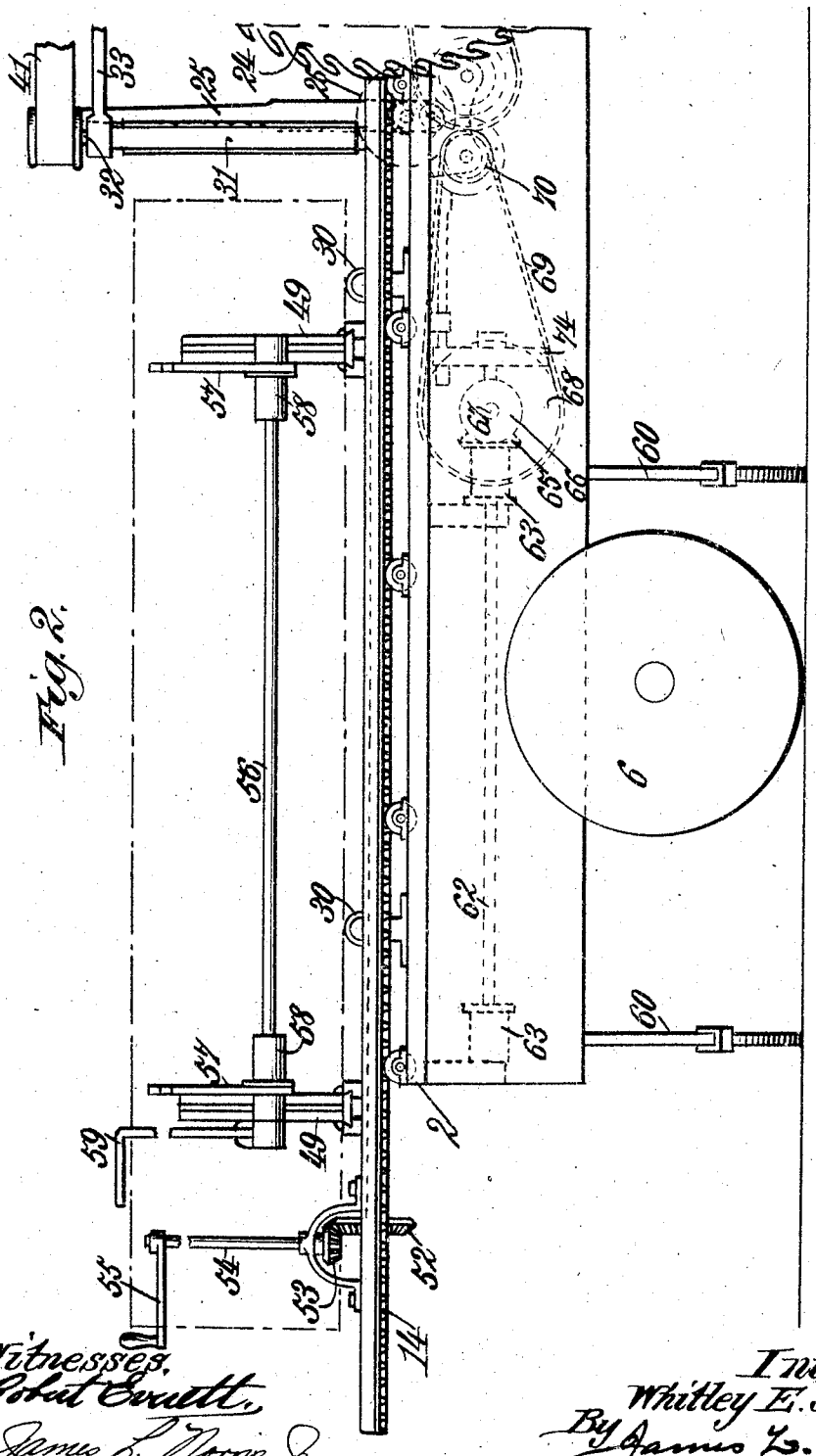

Fig. 2.

Witnesses,
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PHOTO LITHOGRAPHED BY SACKETT & WILHELMS LITHO. & PTG. CO. NEW YORK.

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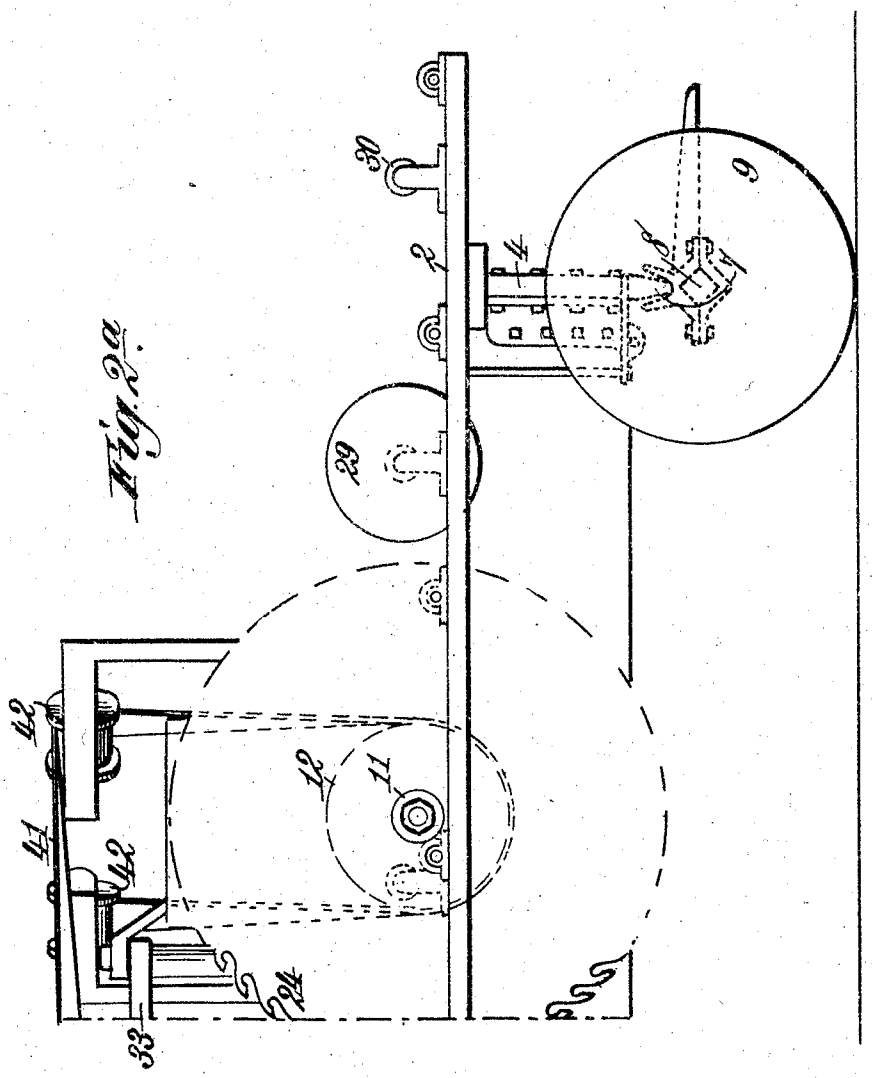
7 SHEETS—SHEET 4.

Fig. 2a



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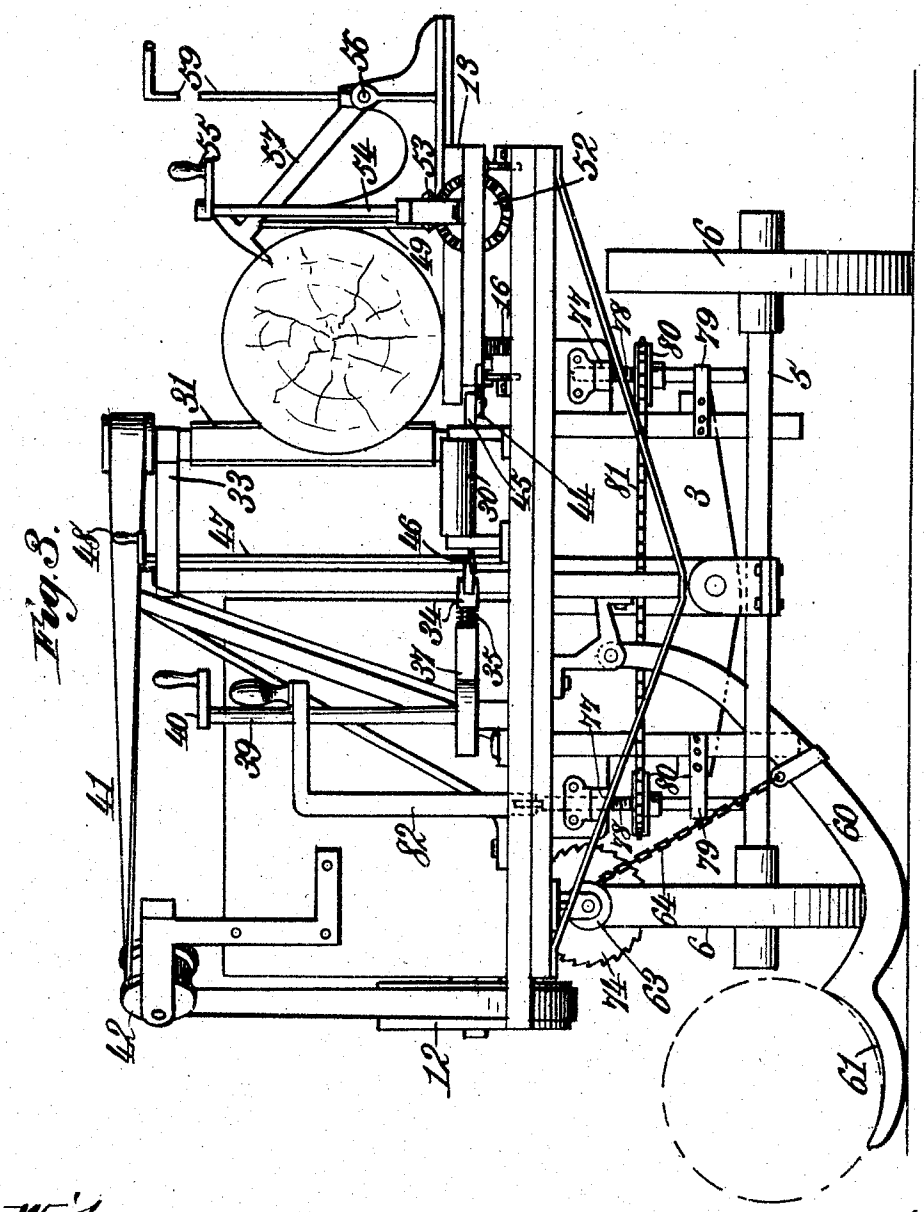
7 SHEETS—SHEET 5.

Fig. 3.



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7 SHEETS—SHEET 6.

Fig. 5.

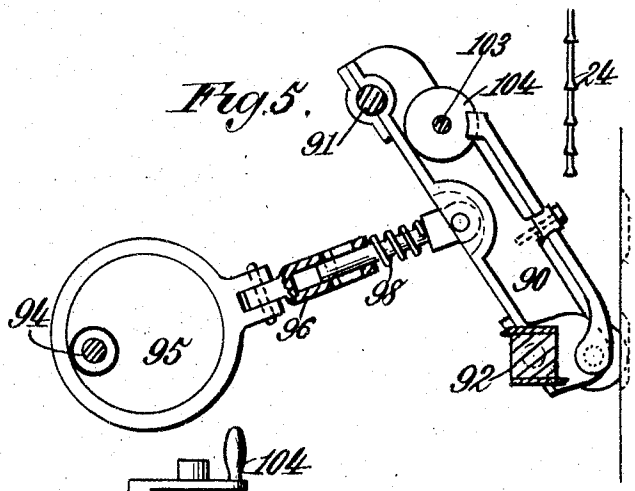


Fig. 6.

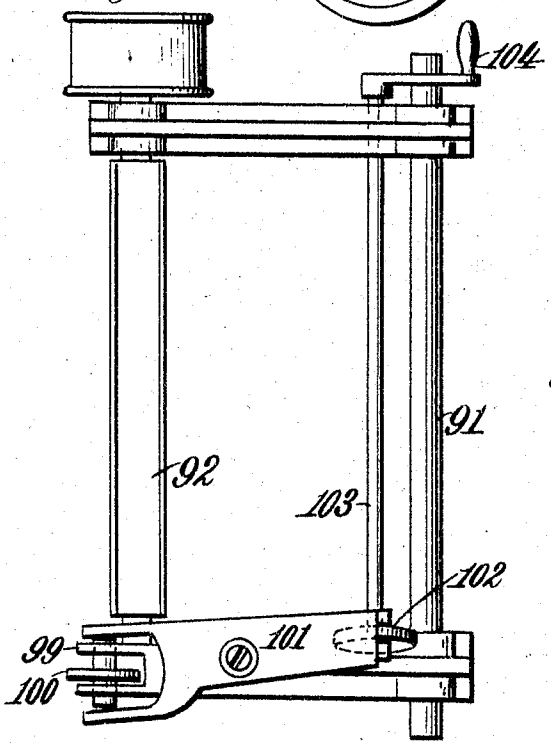
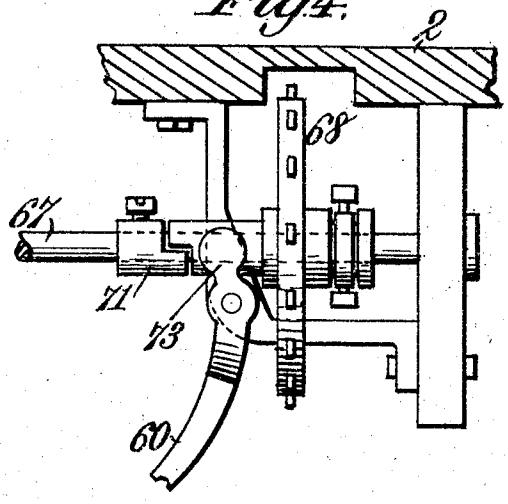


Fig. 4.



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7 SHEETS—SHEET 7.

Fig. 7.

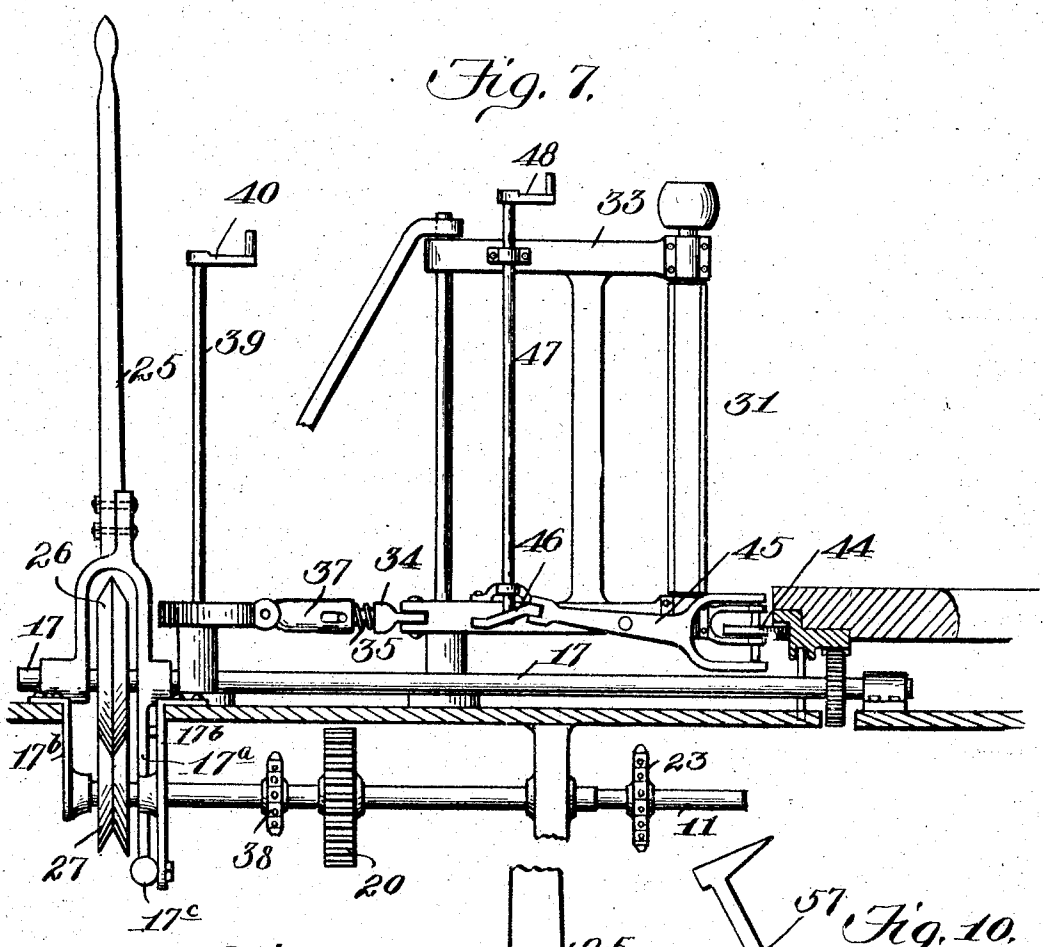


Fig. 9.

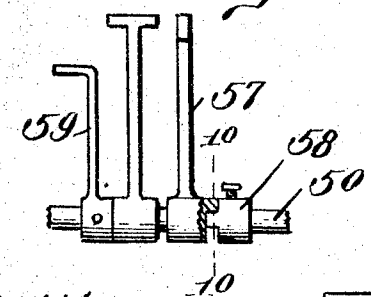


Fig. 8.

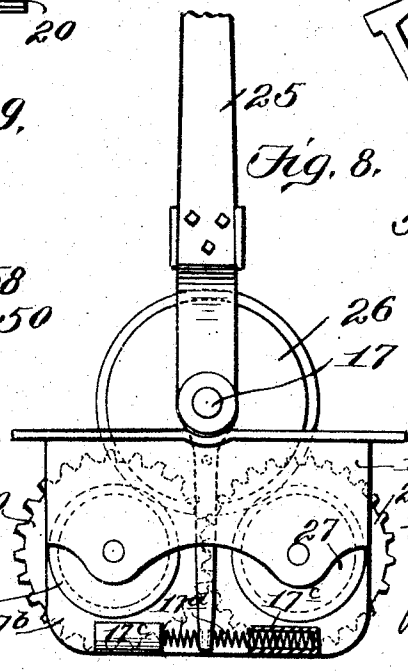
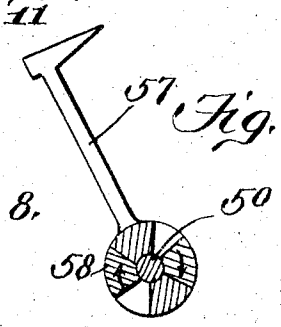


Fig. 10.



Witnesses:
Robt Smith.
James L. Norris Jr.

Inventor
Whitley E. Martin
By James L. Norris.
Atty.

No. 778,258. Patented December 27, 1904.

UNITED STATES PATENT OFFICE.

WHITLEY E. MARTIN, OF WINSTON SALEM, NORTH CAROLINA, ASSIGNOR, BY MESNE ASSIGNMENTS, OF ONE-HALF TO FREDERICK P. MORRILL, OF NEW ORLEANS, LOUISIANA.

MACHINE FOR MAKING RAILROAD CROSS-TIES.

SPECIFICATION forming part of Letters Patent No. 778,258, dated December 27, 1904.

Application filed December 18, 1903. Serial No. 185,738.

To all whom it may concern:

Be it known that I, WHITLEY E. MARTIN, a citizen of the United States, residing at Winston Salem, in the county of Forsyth and State of North Carolina, have invented new and useful Improvements in Machines for Making Railroad Cross-Ties, of which the following is a specification.

This invention relates to a machine for making railroad cross-ties. It should be stated at this point that this title is adopted simply as a matter of convenience, for the machine can be employed with facility in the manufacture of other articles and of a radically-different character than cross-ties.

Ties made by a sawmill of the ordinary type possess a decided objection, owing to the rough surface left by the saw, which rough surface retains moisture, and thereby causes the tie to rot away soon after being put in a railway road-bed. To overcome this objection, I provide means for dressing the tie on one or more of its surfaces and in the present case dress the tie on all of its surfaces, so that the latter will be smooth and present no roughness upon which moisture can be retained. Hand-made ties have an advantage, the act of hewing forming pockets in which ballast can lodge to lock the tie against lateral motion. By virtue of my machine I form pockets in at least one face of the tie or corrugate such face, the pocketed or corrugated face forming recesses for the lodgment of ballast to secure the same advantage that is accomplished by a hand-made tie.

It will therefore be understood that my invention contemplates dressing the several sides of the tie, as well as corrugating one of said sides.

The foregoing is one of the primary features of the invention.

Another important feature of the invention resides in means for supplying stock or logs to the cutting and dressing mechanisms.

Another important feature of the invention is the leveling of the deck or platform of the machine upon which the saw-arbor is mounted. It is essential to secure a desirable character of work that the saw arbor or mandrel should either be horizontally or vertically disposed. With my improved machine the said saw-arbor is shown as horizontally disposed, and by means of the leveling means I can maintain effectively an absolutely-horizontal position of the said arbor by correspondingly leveling the deck or platform, the two latter parts being in parallelism.

In order to insure economy, it is desirable that the machine should be capable of ready movement from place to place, and to bring about this result it is portable, the deck or platform, to which allusion has been made, being mounted upon suitable running-gear.

The invention includes other objects and advantages, which with the foregoing will be set forth at length in the following description, while the novelty of said invention will constitute the basis of the claims succeeding such description.

In the drawings accompanying and forming a part of this specification I have illustrated an organization involving the several features of the invention, and the arrangement of the different parts comprising said organization will be explicitly disclosed in the said description. I wish to state, however, that I do not limit myself to any of the arrangements thus illustrated and described nor to the character of construction of the parts constituting said arrangements or mechanisms, for material variations as to these points may be adopted within the scope of the said claims.

Referring to the drawings, Figures 1 and 1^a are collectively a plan view of a machine embodying my invention. Figs. 2 and 2^a are collectively a right-hand side elevation of the same. Fig. 3 is a rear elevation of said machine. Fig. 4 is a detail in sectional elevation of a clutch and actuating mechanism therefor hereinafter more particularly described. Fig. 5 is a sectional plan view of a slight modification. Fig. 6 is an elevation of the same. Fig. 7 is a sectional elevation of the intermediate portion of the machine, the section being taken just to the left of the cutting mechanism shown in Fig 1 and looking toward the right of said

Fig. 1. Fig. 8 is a detail in elevation of some of the parts shown in Fig. 7 and looking toward the right in said Fig. 7. Fig. 8 is intended to show particularly a portion of the driving mechanism for the carriage. Fig. 9 is a front elevation of the dog mechanism, a portion of the same being removed. Fig. 10 is a sectional elevation, the section being taken on the line 10 10 of Fig. 9.

Like characters refer to like parts throughout the several figures of the drawings.

As hereinbefore stated, the machine is preferably though not necessarily portable. Being portable, however, it may be readily moved to a timber-section, so as to there operate upon the stock or logs previously cut into the requisite lengths.

The said machine includes in its construction a deck or platform 2, upon which certain of the mechanisms are mounted. Upon the under side of said deck or platform and at or near the rear and front, respectively, thereof are bolsters 3 and 4. The rear bolster is pivotally mounted upon a suitable bearing rising from about the middle of the forward axle 5, provided at its opposite ends with some suitable form of wheels 6. From the statement just made it will be obvious that the rear bolster 3 is free to tilt with respect to the axle 5, it being understood that said rear bolster is suitably rigidly fastened to the under side of the deck or platform 2. Therefore when the said bolster is tilted a corresponding movement of the said deck or platform follows. The front end of the platform is connected with the corresponding axle to permit the desired tilting motion. The front bolster 4 is connected by a universal joint, as 7, with the front axle 8, equipped at its ends with wheels 9, like those just alluded to. The mounting of the deck or platform in the manner set forth permits it, through the intervention of proper mechanism, to occupy absolutely a horizontal position, so that the saw arbor or mandrel mounted thereon and in parallelism therewith will be brought to a similar position. A means for leveling the deck or platform and the saw-arbor will be hereinafter set forth.

At a suitable point upon the deck or platform 2 is supported a motor from which the various parts are actuated, and said motor may be of any desirable kind. I have found an explosive gasolene-engine a convenient agent for such purpose. The motor is provided with the usual crank-shaft 11, to one end of which the fly-wheel 12 is fixed, said fly-wheel serving as a power-transferring element, as will hereinafter appear, to operate the dressing device for the ties.

Upon one side of the deck 2 is mounted for longitudinal movement a carriage, as 13, upon which the stock is placed for action by cutting and dressing mechanisms, as will hereinafter appear. This carriage is intermittently reciprocated, whereby a log or other stock thereon is presented on the advancing movement to the action of a cutter, such as a saw, and whereby on the return movement of the carriage the cut or sawed face of the stock can be dressed, so that such face will be ultimately smooth.

I will now set forth the means illustrated for actuating the said carriage.

Fastened suitably to the under side of the carriage is a rack-bar 14, extending longitudinally of the same and the teeth of which are adapted to mesh with the pinion 16; suitably fastened to the transverse shaft 17. This shaft 17 extends in parallelism with two other transverse or counter shafts 18 and 19, to which the intermeshing spur-gears (each denoted by 20) are suitably fastened. To the inner end of the transverse or counter shaft 18 is fastened the sprocket-wheel 21, connected by a sprocket-chain 22 with the sprocket-wheel 23, fast to the inner end of the motor or main shaft 11. Therefore while the motor is in operation the shafts 18 and 19, through the intermeshing gears 20, will be continuously rotated.

The motor-shaft 11 constitutes an arbor or mandrel for the stock-cutter, said stock-cutter being shown as a saw 24 of the rotary type and being suitably united to its shaft or arbor. While the motor-shaft is in operation the saw 24 naturally will be driven.

The shaft 17 is normally at rest and is adapted through the means of certain reversing driving mechanism to be operated alternately in opposite directions, as will now be set forth.

Said shaft 17 passes freely through a shipping-lever 25, having a handle at its upper end by which it can be manipulated, said lever being fulcrumed below the coöperating shaft and being adapted to ship or shift a friction-wheel 26 into driving relation with one of the friction-wheels 27 and 28. The friction-wheel 26 is suitably fixed to its shaft 17, while the friction-wheels 27 and 28 are suitably fixed to their shafts. By means of the lever 25 the friction-wheel 26 can be thrown into driving relation with the friction-wheel 27, whereby the shaft 17 will be operated, and the parts are so arranged that when said shaft 17 is rotated under the action of the friction-wheel 27 the carriage 13 will be advanced through the intermeshing pinion 16 and rack 14 so as to move the log or stock on said carriage past the saw to cut a slab off the stock. It will be seen upon reference particularly to Figs. 7 and 8 that that portion of the lever 25 through which the shaft 17 extends is of yoke form. One branch of the yoke has a downward extension 17^a, which extension is pivotally connected to the inner of the depending plates 17^b, connected to the deck of the machine, and between which plates the friction-wheels 27 and 28 are located. The lower edge of the inner plate 17^b extends below the cor-

responding edge of the companion plate, and to the said extended portion are suitably united, as by bolts, two sleeves or cylinders, as 17^c, closed at their outer ends. Coiled push-springs, as 17^d, are partially inclosed by these sleeves or cylinders, the outer ends of the springs bearing against the closed outer ends of the two sleeves, while the inner ends of said springs fit in shallow pockets in the extreme lower end of the downwardly-projecting portion 17^a of the hand-lever 25. The office of the springs 17^d, which are of equal power, is to maintain the hand-lever 25 normally in a perpendicular position, at which time the periphery of the friction-wheel 26, operated by said lever, will be out of contact with the peripheries of the friction-wheels 27 and 28. When the hand-lever 25 is moved in either direction, as hereinbefore stated, to put the friction-wheel 26 into working relation with either of the friction-wheels 27 or 28, the carriage, through the intermediate mechanism, will be driven.

In cutting ties a log is initially placed upon the carriage, and means will be hereinafter described for bringing about this result. The said log is so presented to the saw that four slabs will be cut from the same, whereby the finished article will present a structure rectangular in cross-section. Therefore upon each advancing movement of the stock or log supporting carriage a slab is cut from the same. After a slab has been cut from the carriage its motion should be reversed, and this is secured by throwing the friction-wheel 26 into contact with the friction-wheel 28 by means of the hand-lever 25, it being understood, of course, that the shafts 18 and 19 turn in opposite directions.

The saw 24 is longitudinally alined with a splitter 29, which traverses the cut made by the saw, as is customary in sawmills. The machine is further provided with rollers 30 for the purpose of holding the slab and stock in position to be rolled to and fro, as is ordinarily done in sawmills.

Upon the advancing movement of the stock-carriage 13 or, as it is shown in the drawings, toward the rear of the deck 2 a slab is cut from the stock, which in the present case is a log. On the return or retractive movement of the carriage the said cut face of the stock is dressed, and in the present case one of the dressed faces is corrugated, so as to form pockets or insets for the reception of ballast when the tie is placed in a road-bed, whereby the tie will be prevented from lateral motion.

The dressing device for the sawed or cut face of the stock may be of any desirable character. It is shown as consisting of a cutter-head 31, suitably fixed to a shaft 32, rotatably carried by the longer branch of an oscillatory frame 33, movable about on a vertical axis suitably supported upon the machine. During the cutting of the stock by the saw 24 the said dressing device should be out of action, and the means for securing this result will be hereinafter described. The cutter-head 31 is of a kind familiar in the wood-working art, and hence a detailed description of the same is not necessary. The said frame 33 is represented as being of acute angular form. To the short or inner branch of said oscillatory frame 33 is connected a spindle 34, surrounded by the coiled spring 35. The free end of said spindle 34 fits in the sleeve portion of a ring 37, which ring 37 surrounds an eccentric upon the vertically-disposed shaft 39, said shaft 39 carrying at its upper end a hand-crank 40, by which it may be turned. That part of the spindle 34 which is inclosed by the sleeve of the ring 37 is provided with lateral projections extending through longitudinal slots in such sleeve. Therefore when the hand-crank 40 is swung inward the eccentric 38 will be moved so as to transfer, through the coiled spring 35, a yielding pressure to the oscillatory frame 33, to thereby hold the cutter-head 31 yieldingly against the work. Upon the outward movement of the hand-lever the opposite results will take place. Upon the inward movement of the hand-lever an angularly-disposed belt hereinafter described and which is employed to drive the cutter-head is tightened in order to rotate said cutter-head. Upon the backward movement of the hand-lever the belt will be loosened, so as to stop the rotation of said cutter-head. During the cutting of the stock by the saw the said hand-crank 40 is in its retracted position, the cutter-head naturally being at rest. On the return movement of the stock with the carriage the hand-crank is manipulated so as to throw the cutter-head into action for dressing the stock.

The driving-belt for the cutter-head 31 is denoted by 41, and it passes around the fly-wheel 12 of the motor-shaft 11 and also against guide-rollers 42, suitably mounted upon the machine and so located that what might be considered the inner portion of the driving-belt will be disposed at an angle, whereby when the hand-crank 40 is swung inward the said belt will be tightened to effect the driving of the cutter-head, the inner bight of the said belt passing around a suitable pulley upon the shaft 32 of the cutter-head. When said hand-crank, however, is swung rearward, the said belt 41 will be loosened, by reason of which the cutter-head will not be rotated.

In operation after a log has been placed on the carriage 13 the carriage is advanced, so as to cause the saw 24 to cut a slab from the stock or log on said carriage. During said advancing movement of the latter the cutter-head or dressing device is out of action. Before the reverse driving mechanism for the carriage is thrown into action the hand-crank 40 is swung inward, so as to bring about the rotation of

the cutter-head, and after this is accomplished the carriage is reversed or returned to its primary position, and during such motion the knives of the cutter-head will operate against the sawed face of the stock to dress down or smooth off such face. This operation may be repeated upon all four sides of the stock, or a fourth side of the stock may be given a pocketed or corrugated form, the pockets in the case of railroad-ties forming recesses for the lodgment and retention of ballast. It will be remembered that the dressing device or cutter-head 31 is held yieldingly to the work, and an advantageous result is secured by reason of this point.

To the carriage 13 is suitably fastened a templet or former 43, the working portion of which is so shaped as to secure a corresponding motion of the cutter-head, whereby said cutter-head when the working portion of the templet is in action will give to the work a pocketed or corrugated form. This templet has superposed ineffective and effective or working portions, the working portion of the templet consisting of a series of pockets or depressions, into which a former-wheel, hereinafter described, may be thrust, so as to secure a transverse movement of the cutter-head.

The former-wheel, which coöperates with the templet, is denoted by 44, and normally it traverses the ineffective or non-working portion of the templet 43, said wheel being actuated when it is desired to corrugate the stock by a lever 45, fulcrumed upon the carrier or frame 33 for the cutter-head 31. The outer end of the lever 45 is adapted to directly operate the wheel 44, while the inner end of said lever is in position for engagement by a cam 46 upon a vertically-disposed stub-shaft 47, provided at its upper end with a hand-crank 48. When it is desired to corrugate the work, the hand-crank 48 is engaged and swung outward, thereby causing the effective portion of the cam 46 to ride against the inner end of the lever 45, lowering said inner end and correspondingly elevating the upper end of the lever, whereby said upper end of the lever will elevate the former-wheel 44 a like extent, so as to carry the periphery of said former-wheel into the horizontal plane of the effective or corrugated portion of the templet 43. This manipulation of the hand-crank 48, it will be understood, occurs after three sides of a tie have been dressed. After a fourth slab has been cut off the cut side is presented to the action of the cutter-head.

The working portion of the templet 43, as will be understood, consists of a succession of pockets, said templet of course extending the complete length of the carriage 13. After the fourth slab has been cut off the former-wheel 44 is elevated, in the manner hereinbefore described, to the plane of the effective portion of the templet, the cutter-head 31 at this time being rotated. Therefore upon the return movement of the carriage the former-wheel is caused to successively ride into and then out of the pockets of the templet, the spring 35 acting through the intermediate parts and serving to force said former-wheel into said pockets, while the walls of the pockets are so shaped as to impart an opposite movement to the former-wheel. The cutter-head is thereby given a vibratory movement when the former-wheel is in contact with the effective portion of the templet, so that the cutter-head will be caused to gouge out of the stock pockets and between said pockets will dress down the stock, so that after the corrugation of the tie the corrugated face, or that part thereof between the pockets, will be dressed. When the tie has been corrugated, the crank 48 will be returned to its initial position, thereby permitting the former-wheel 44 to drop away from the corrugated portion of the templet. A second log is then presented for action by the sawing and dressing or dressing and corrugating mechanisms. In some cases it may be desired to dress all four sides without corrugating one of them, and this can be accomplished by the non-manipulation of the crank 48. The manipulation of the crank may occur at any desired time. It may occur after the first face has been dressed or after one of the ensuing ones has been dressed. These are points that are left to the discretion of the particular user of the machine.

While the log or stock is upon the carriage 13 it rests against the knees 49, two of said knees being shown and being suitably guided for transverse movement upon said carriage. Extending longitudinally of the deck 2 is a shaft 50, having at suitable points in its length pinions 51, (see dotted lines, Fig. 1,) meshing with racks on the under side of the knees 49, so that when the shaft is turned the knees can be moved in unison inward and outward to laterally adjust the stock. The racks on said knees are not illustrated, as the same is a common feature in sawmills of various types. The shaft 50 fixedly carries near the forward end of the machine a bevel-gear 52, meshing with a corresponding bevel-gear 53 upon a suitably-supported vertical shaft 54, having a hand-crank 55 at its upper end, by turning which latter the shaft 50 may be turned to cause the inward or outward movement of the two knees. At a point outside the shaft 50 and supported by the knees is a shaft 56, which loosely carries the dogs 57, the teeth of which are adapted to penetrate the work by gravity. The dogs being loosely mounted upon their shaft 56 are therefore independently operative, so that their teeth can properly bite into wood, even though the latter be of conical or tapered form.

To the shaft 50 are suitably fixed the sleeves 58, (see Figs. 9 and 10,) each of which has two projections coöperating with substantially

similar projections upon the hubs of the respective dogs. To operate the shaft 50, it may be provided with a hand-lever 59, suitably rigidly attached thereto. When a dog is in its ineffective position, it is disposed as represented in Fig. 10, the projections on the hub of the dog being against the similar projections upon the sleeve 58. When the hand-lever 59 is swung inward, the shaft 50 will be turned in a forward direction or will follow the path indicated by the arrows in Fig. 10, the projections on said sleeve 58 being moved in a similar direction, so as to swing the dog 57 inward. The instant the dog passes the vertical it drops of its own weight toward the log, the projections on the hub of the dog naturally moving away from the coöperating projections on the sleeve. The same operation is followed with the other dog. To return the dogs to their initial positions, the hand-lever 59 is swung outward, and when it has moved a short distance the sleeves 58, acting in a manner reverse to that hereinbefore described, will serve to swing the two dogs in a direction corresponding with the return movement of said hand-lever.

The machine includes in its construction means for lifting the logs from the ground onto the deck 2 of the machine, from which they can be transferred to the traveling carriage 13, and the lifting means receives its motion through the agency of proper connections from the shaft 11, as will hereinafter appear.

The lifting mechanism includes in its construction two lifters, shown as levers 60, spaced apart a desired distance and suitably pivoted near their inner ends on the under side of the deck or platform 2. The outer ends of the levers have alined concaved seats 61, into which a log can be readily rolled and properly retained during the elevation of said levers.

Near the outer side of the deck 2, opposite that side upon which the shaft 56 is mounted, is a second shaft 62, fixedly carrying drums or pulleys 63, one drum being located practically above each lever 60. These drums have chains or cables 64 wound thereon and depending therefrom, the depending ends of the chains or cables being suitably connected to the levers 60 between the fulcrums and outer ends of the latter. Upon the rotation of the shaft 62 the drums or pulleys 63 will be rotated, and when rotated in one direction they wind thereon the cables or chains 64 to elevate the levers 60. Upon a reverse motion of said shaft 62 the chains or cables will play off or be unwound from the coöperating drums to thereby permit the two levers to drop onto the ground and into position to receive a log. Upon the inner end of the shaft 62 is fixed a bevel-gear 65, meshing with a coöperating bevel-gear 66, fixed to the transverse shaft 67, loosely carrying at its inner end the sprocket-wheel 68, connected by a sprocket-chain 69 with a sprocket-wheel 70, fixed to the shaft 19, which shaft 19, it will be remembered, is continuously driven—that is to say, it is rotated as long as the motor is in operation—and the same result will follow with respect to the sprocket-wheel 68.

To the transverse shaft 67 is keyed one member of a clutch 71, the other member of said clutch being upon the sprocket-wheel 68, which, as has been stated, runs loose on the shaft 67. A hand-lever is shown at 72, said hand-lever being pivotally supported upon the deck or platform 2 for movement about a vertical axis and being of angular form, the short arm of the angle-lever being arranged to engage the sprocket-wheel 68 to move the clutch-half thereon into engagement with the coöperating clutch-half of the clutch 71, whereby the sprocket-wheel 68 will be coupled to the shaft 67.

It will be assumed that the outer arms of the two levers 60 are resting on the ground in position to receive a log and that the shaft 62 is at rest. A log is rolled into the concaved seats 61 of the said levers, after which said levers are thrown into action, and this is accomplished by the manipulation of the hand-lever 72 to throw the short arm thereof into position to move the sprocket-wheel 68 slightly outward along its shaft 67 to bring about the engagement of the two members of the clutch 71 in the manner hereinbefore set forth. As soon as the halves of said clutch are engaged the shaft 67 will be rotated thereby through the intermeshing bevel-gears 66 and 65, imparting a corresponding movement to the shaft 62, whereby the drums 63 will be rotated to wind their cables or chains 64 in order to elevate the two levers 60. The inner end of one of the levers 60 is provided with a toe 73, which when said levers have practically reached their uppermost position is arranged to engage the sprocket-wheel 68 to move said sprocket-wheel slightly inward and disconnect the clutch-half thereon from the corresponding clutch-half fixed to the shaft 67, whereby the rotation of the latter will be stopped to prevent the further elevation of the two levers 60.

I provide means for preventing the immediate return movement of the levers 60 after the log has been elevated, and that shown for this purpose will now be set forth.

To the shaft 62 is fixed a ratchet-wheel 74, with which the gravity-pawl 75 coöperates, said pawl being fixed to the crank-shaft 76, mounted upon the deck of the machine in adjacence to the said ratchet. During the elevation of the two lifting members in the manner before described the pawl 75 rides over the teeth of the ratchet 74, and said pawl is effective when the operating means for the lifting-levers is thrown out of action, as hereinbefore set forth, to prevent the dropping

of the levers. When, however, it is desired to permit the said levers to fall to the ground, the pawl 75 is lifted away from the teeth of the ratchet-wheel 74, and this is brought about by engaging the crank portion of the shaft 76. The instant that the pawl is disengaged from the ratchet the two levers at once gravitate to the ground.

When the two levers 60 reach approximately the limit of their upward movement, the log sustained thereby can be rolled from the concaved seats 61 onto the deck 2 and from there transferred to the carriage 13 to be sawed and dressed.

The means illustrated for elevating the deck or platform 2 will now be set forth, such means being of importance when it is considered that the machine travels over ground that is rough and uneven.

The rear bolster 3 has suitably fixed thereto at opposite sides of the longitudinal center of the machine the nuts 77 to receive the screws 78, the screws being respectively right and left handed and the coöperating nuts being similarly threaded. The lower ends of the two screws or threaded spindles 78 are arranged to engage the front axle 5, the said screws or threaded spindles passing through suitable guide-sleeves, as 79, of smooth-bore form, suitably fastened to said front bolster 3. Each screw or spindle 78 fixedly carries a sprocket-wheel 80, connected for movement in unison by a sprocket-chain 81, while one of the spindles is squared at its upper end to enter a correspondingly-shaped socket in the lower end of a hand-crank 82. By turning said hand-crank 82 the screw or spindle 78 connected therewith can be turned, whereby the other screw, through the sprocket-and-chain connection, will be simultaneously turned. As the two screws bear at their lower ends against the front axle 5, it will be plain that when the hand-crank 82 is turned a tilting movement will be imparted to the rear bolster 3 and a corresponding movement transferred, through the deck 2, to the front bolster 4 in order to bring the deck 2 absolutely into a horizontal position, a level being employed to indicate this fact. In some cases it may not be necessary to use the leveling means; but if it is they are present in order to horizontally position the deck 2 and correspondingly position the arbor of the saw or cutter 24.

In Figs. 5 and 6 I have shown a slight modification of the cutter supporting, guiding, and actuating mechanisms. Referring to said figures, the numeral 90 denotes an oscillatory frame supported for swinging movement by the vertical shaft 91, carried upon the framework of the machine. At what might be considered the forward end of the swinging frame is mounted the cutter 92, the equivalent of the one hereinbefore described, the shaft of said cutter 92 carrying a pulley or other power-driven element for rotating, through the agency of suitable driving means, said cutter. An intermittently hand-operable shaft is shown at 94, it having an eccentric 95 embraced by the ring of a pitman 96, which, it will be seen, is in two parts, one tubular to receive the other, and the latter part being surrounded by a spring 98, which serves to hold the frame 90, and hence the cutter 92, rotatively supported thereby, yieldingly to the work. The construction of the cutting mechanism just described is practically the same as that hereinbefore set forth, the two differing only in slight details. The lower portion of the swinging frame 90 is bifurcated, as at 99, the branches of the bifurcation being perforated to freely receive the spindle of the former-wheel 100, said spindle being located between the fork at one end of the operating-lever 101, fulcrumed upon the lower portion of the frame 90. One arm of the lever 101 is forked, while the other arm is notched to receive the angularly-set disk or wheel 102, the vertical shaft 103 of which is suitably supported by the swinging frame 90, and said shaft 103 carries at its upper end a hand-crank 104 for turning said shaft, whereby the disk 102 carried thereon can rock the lever 101, so that said lever can either elevate the former-wheel 100 or permit the latter to drop by its own weight, whereby said former-wheel can be moved into engagement with either the pocketed or plain face of the templet hereinbefore described.

The operation of the mechanism shown in Figs. 5 and 6 is practically the same as that hereinbefore described, and it will be obvious at once upon an inspection of said two figures.

Having thus described the invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a machine for making railroad crossties, the combination of a carriage for supporting a log, means for reciprocating said carriage, a saw for cutting the log on the advancing movement of the carriage, a cutter arranged to act against the cut face of the log on the return movement of the carriage, and means for vibrating the cutter toward and from the plane of the saw during the backward movement of the carriage.

2. In a machine for making railroad crossties, the combination of a carriage for supporting a log, means for reciprocating said carriage, a saw for cutting the log on the advancing movement of the carriage, an oscillatory frame having a cutter arranged to act against the cut face of the log on the return movement of the carriage, a belt extending angularly across the machine for driving the cutter, hand-operated means for shifting the said frame to carry the cutter toward the work and to simultaneously tighten the belt, where-

by the latter becomes effective to drive said cutter, and means for vibrating the cutter toward and from the plane of the saw.

3. In a machine for making railroad crossties, the combination of a carriage for supporting a log, means for reciprocating said carriage, a saw for cutting the log on the advancing movement of the carriage, a cutter arranged to act against the cut face of the log on the return movement of the carriage, yieldable means acting against the cutter to force the same positively toward the plane of the saw, and independent means for moving the cutter in opposition to said yieldable means, whereby the cutter will be caused to vibrate toward and from the plane of the saw.

4. In a machine for making railroad crossties, the combination of a carriage for supporting a log, means for reciprocating said carriage, a saw for cutting the log on the advancing movement of the carriage, a cutter arranged to act against the cut face of the log on the return movement of the carriage, yieldable means for positively pressing the cutter toward the plane of the saw, and a templet carried by the carriage for imparting a movement to the cutter in opposition to said yieldable means, whereby the cutter will be caused to vibrate toward and from the plane of the saw.

5. In a machine for making railroad crossties, the combination of a portable platform, a carriage for supporting a log on said platform, means for reciprocating said carriage, a saw for cutting the log on the advancing movement of the carriage, a cutter arranged to act against the cut face of the log on the return movement of the carriage, means for vibrating the cutter toward and from the plane of the saw, a power-shaft connected with said platform, and mechanism for securing the movement of the platform from place to place and the rotation of said cutter, operated by said power-shaft.

6. In a machine for making railroad crossties, the combination of a platform, a carriage for supporting a log, means for reciprocating said carriage, a saw for cutting the log on the advancing movement of the carriage, a cutter arranged to act against the cut face of the log on the return movement of the carriage, means for vibrating the cutter toward and from the plane of the saw, and means for lifting a log from the ground and for elevating it toward said platform.

7. In a machine for making railroad crossties, the combination of a carriage for supporting a log, means for reciprocating said carriage, a saw for cutting the log on the advancing movement of the carriage, a cutter arranged to act against the cut face of the log on the return movement of the carriage, an oscillatory frame for carrying said cutter, yieldable means acting against the oscillatory frame to carry the cutter toward the plane of the saw, a templet connected with the carriage, and a lever mounted upon said frame and provided with a wheel to traverse the working portion of the templet.

8. In a machine for making railroad crossties, the combination of a carriage for supporting a log, means for reciprocating said carriage, a saw for cutting the log on the advancing movement of the carriage, a cutter arranged to act against the cut face of the log on the return movement of the carriage, an oscillatory frame for carrying said cutter, yieldable means acting against the oscillatory frame to carry the cutter toward the plane of the saw, a templet connected with the carriage, a lever mounted upon said frame and provided with a wheel to traverse the working portion of the templet, and hand-operable means on the frame for operating said lever in a direction to carry said wheel out of engagement with the working portion of the templet.

9. In a machine for making railroad crossties, the combination of a carriage for supporting a log, means for reciprocating said carriage, a saw for cutting the log on the advancing movement of the carriage, a cutter arranged to act against the cut face of the log on the return movement of the carriage, an oscillatory frame for carrying said cutter, yieldable means acting against the oscillatory frame to carry the cutter toward the plane of the saw, a templet connected with the carriage, a lever mounted upon said frame and provided with a wheel to traverse the working portion of the templet, a shaft carried by the said frame, provided with a cam for operating said lever in a direction to carry the wheel out of engagement with the working portion of the templet, and a manually-operable device connected with the shaft for turning the same.

10. In a machine for making railroad crossties, a deck or platform, a traveling carriage associated with said deck, mechanism for cutting the stock while on the carriage, lifting mechanism for the stock including a pair of levers supported below said deck, and driving mechanism for actuating the lifting mechanism, having a clutch, one of said levers being provided with means to engage a clutch part to throw it out of working relation with its companion when the stock has reached a predetermined height.

11. In a machine for making railroad crossties, a portable part having a carriage for supporting a log, a power-shaft, mechanism actuated from the power-shaft for driving the portable part and for reciprocating said carriage, a saw for cutting the log on the advancing movement of the carriage, a cutter arranged to act against the cut face of the log on the return movement of the carriage, means for vibrating the cutter toward and from the plane of the saw, lifting mechanism for the log including a pair of levers supported below said deck, and driving mechanism oper-

ated from said power-shaft for actuating the lifting mechanism, having a clutch, one of said levers being provided with means to engage a clutch part to throw it out of working relation with its companion when the stock has reached a predetermined height.

12. In a machine for making railroad crossties, a deck or platform, a traveling carriage associated with said deck, mechanism for cutting the stock while on the carriage, lifting mechanism for the stock including a pair of levers supported below said deck, the forward ends of the levers having concaved seats to receive the log, and driving mechanism for actuating the lifting mechanism, including a clutch, one of the levers being provided with means to engage a clutch part to throw it out of working relation with its companion when the stock has reached a predetermined height.

13. In a machine for making railroad crossties, a deck or platform, a traveling carriage associated with said deck, mechanism for cutting the stock while on the carriage, lifting mechanism for the stock including a pair of levers supported below said deck, a shaft provided with winding-drums furnished with connections united to the levers, a power-driven shaft, provided with a clutch, operatively connected with said first-mentioned shaft, one of said levers being adapted to throw one of the members of the clutch out of engagement with the companion clutch part, and means for preventing retractive movement of said first-mentioned shaft.

14. In a machine for making railroad crossties, the combination of a deck or platform, a traveling carriage associated with said deck, mechanism for cutting the stock while on the carriage, lifting mechanism for the stock including a pair of levers supported below said deck, a shaft, provided with winding-drums, operatively connected with said levers, a power-driven shaft operatively connected with said first-mentioned shaft and having a clutch adapted for operation by one of the levers, hand-operable means for also operating the clutch, a ratchet connected with the first-mentioned shaft, and a hand-operable pawl coöperative with the ratchet.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

WHITLEY E. MARTIN.

Witnesses:
V. W. MARTIN,
G. M. DAVIS.