W. MOORE.

UPRIGHT BAND SAW SHINGLE MACHINE.

APPLICATION FILED FEB. 11, 1910.

972,562. **Patented Oct. 11, 1910.**

7 SHEETS—SHEET 1.

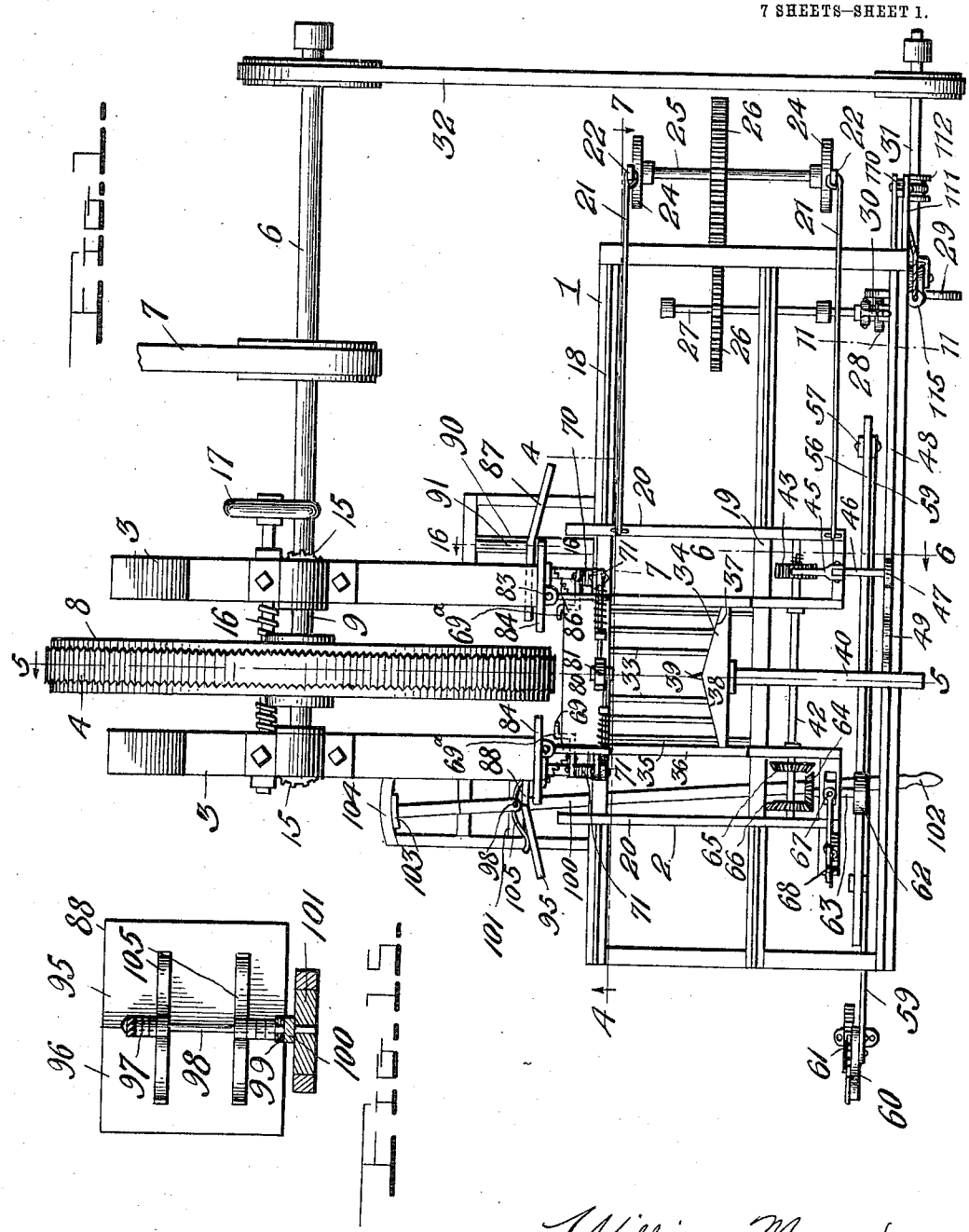

FIG. 1.

FIG. 15.

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7 SHEETS—SHEET 2.

Fig. 2.

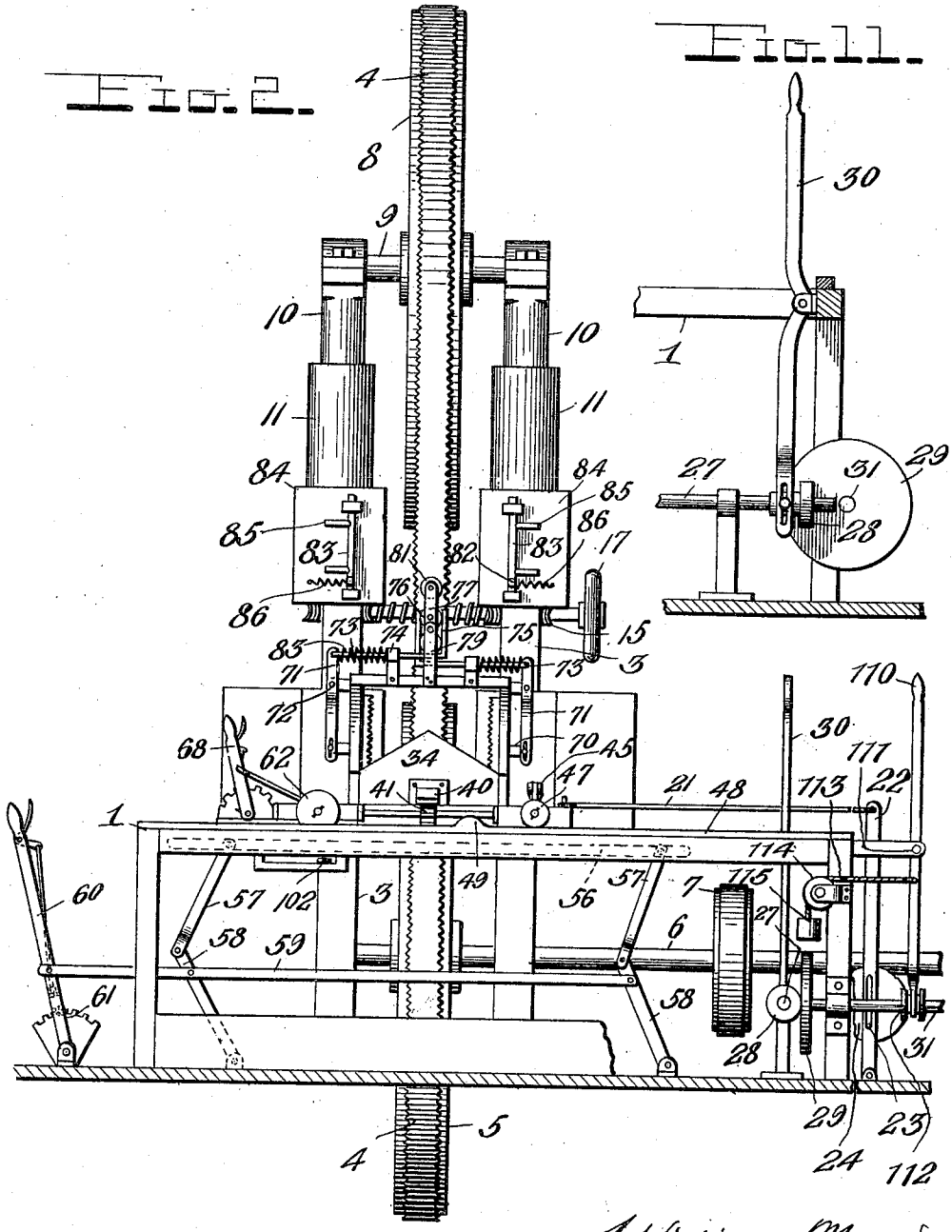

Fig. 11.

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7 SHEETS—SHEET 3.

Fig. 3.

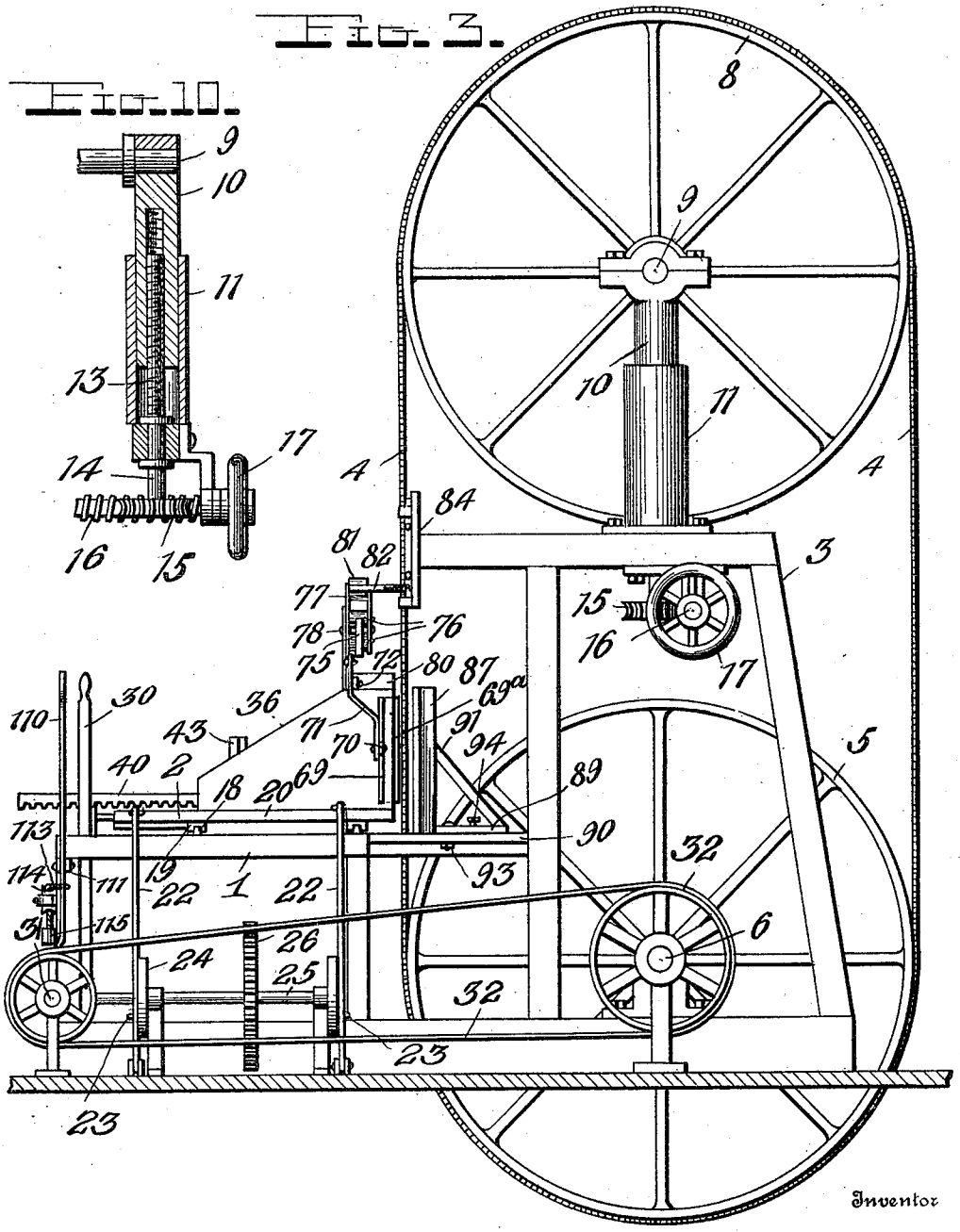

Fig. 10.

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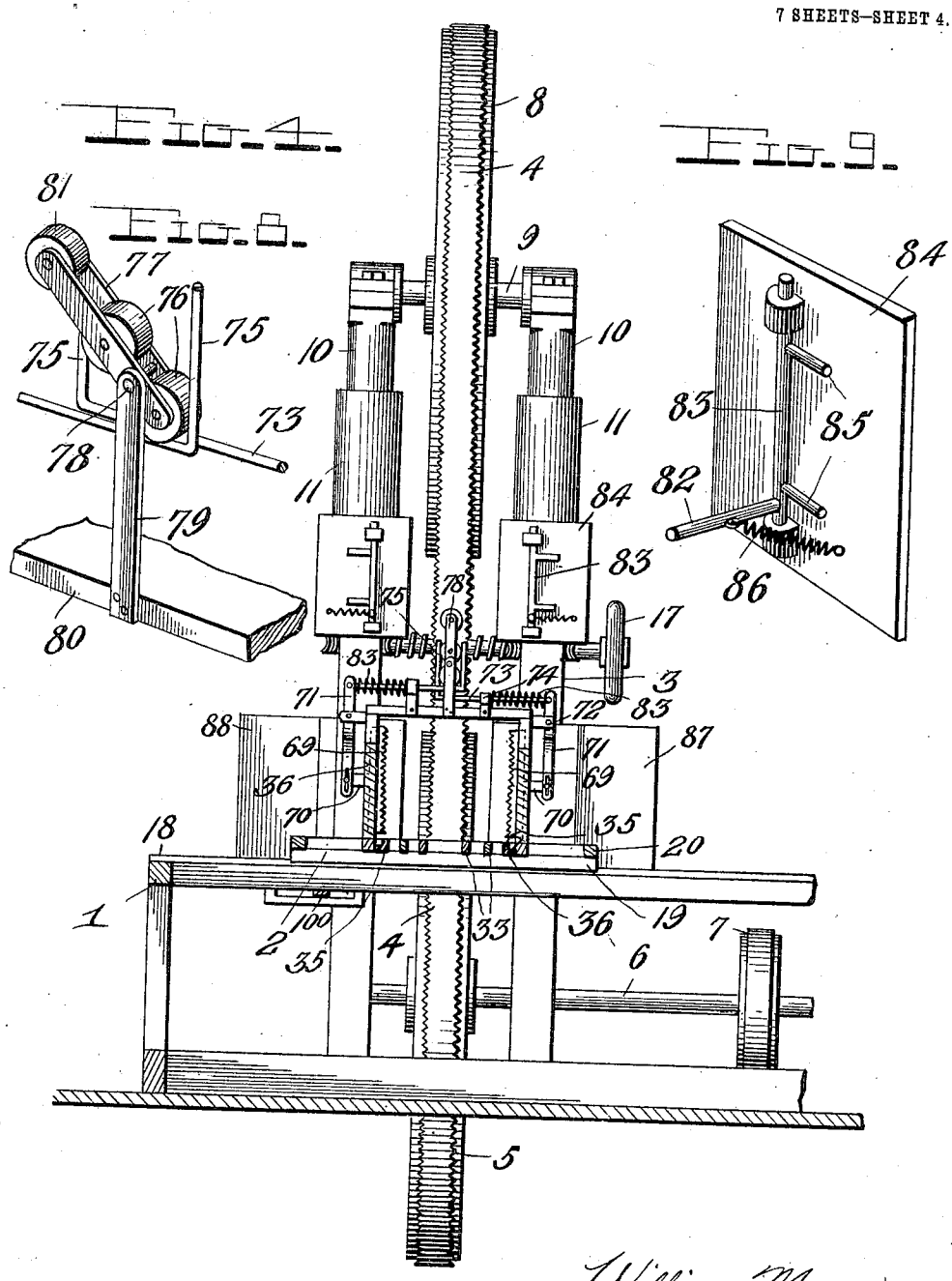
7 SHEETS—SHEET 4.

FIG. 4.

FIG. 9.

FIG. 8.



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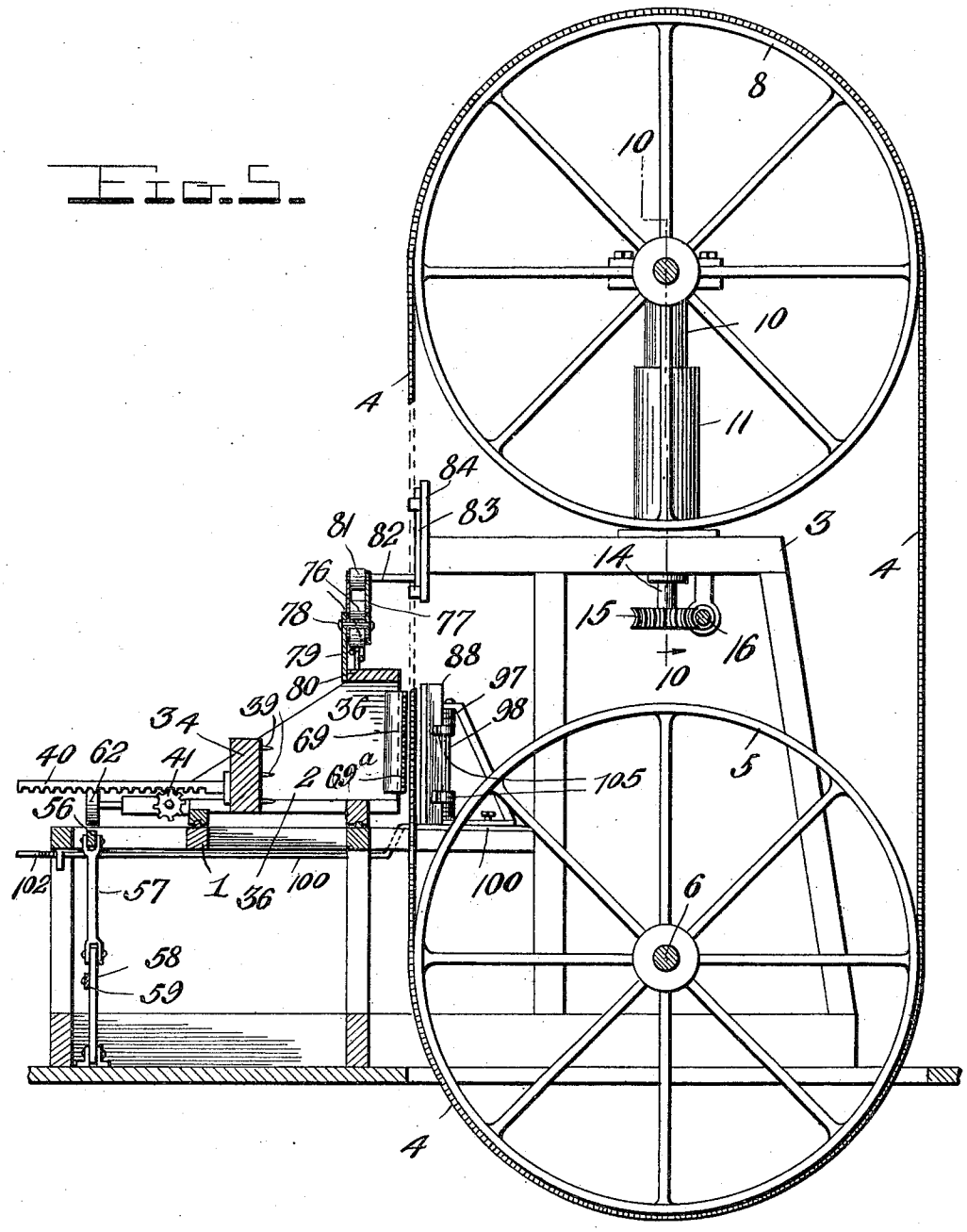
7 SHEETS—SHEET 5.

Fig. 5.



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7 SHEETS—SHEET 6.

Fig. 6.

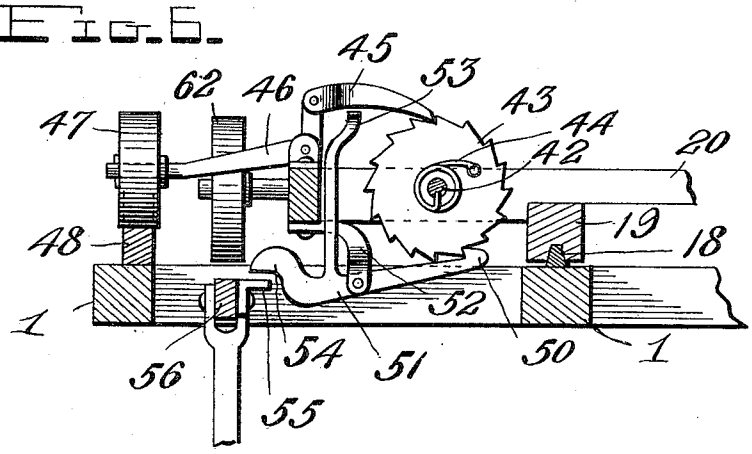
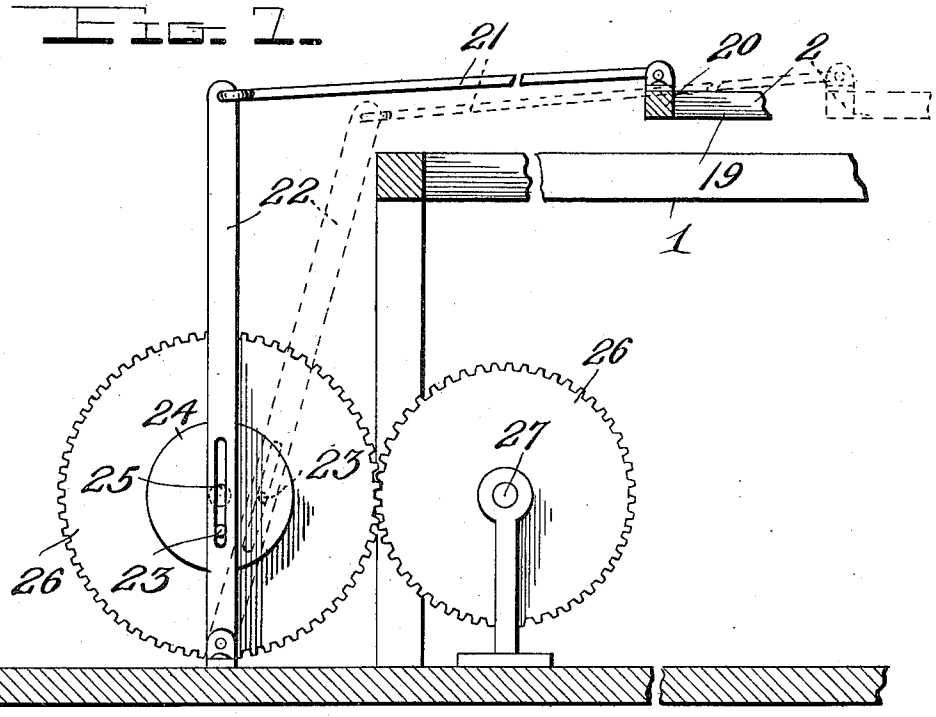


Fig. 7.



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7 SHEETS—SHEET 7.

Fig. 14.

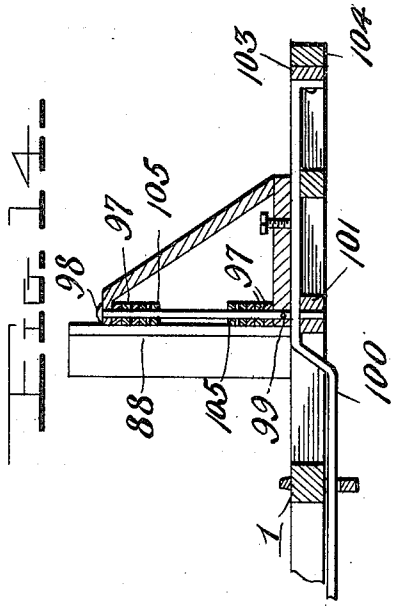


Fig. 15.

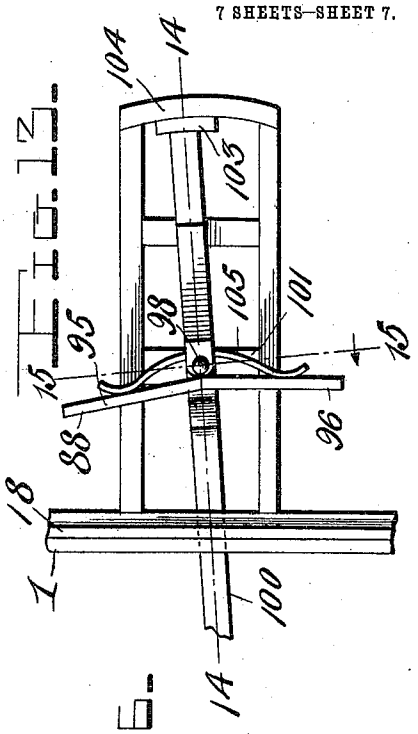


Fig. 12.

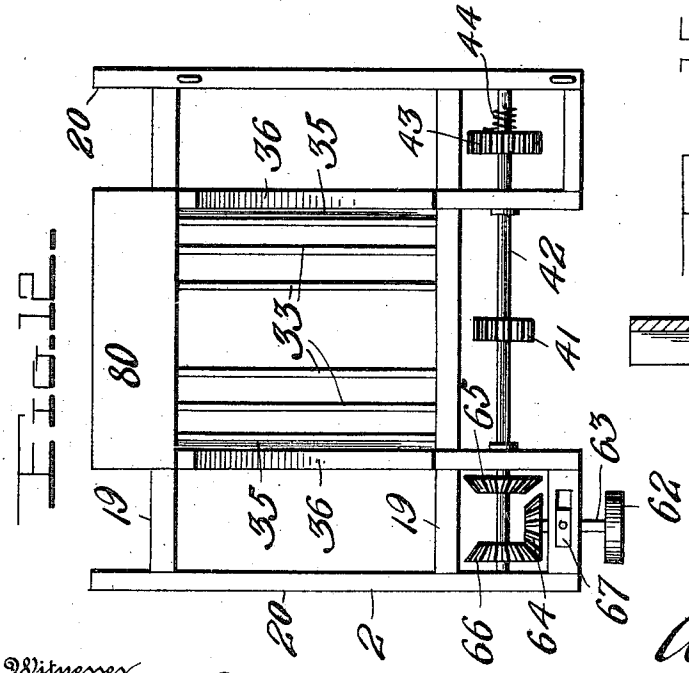
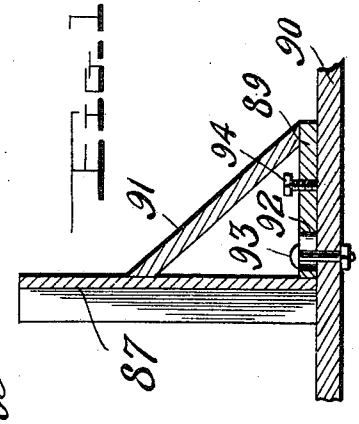


Fig. 16.



Witnesses

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UNITED STATES PATENT OFFICE.

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UPRIGHT BAND-SAW SHINGLE-MACHINE.

972,562. Specification of Letters Patent. Patented Oct. 11, 1910.

Application filed February 11, 1910. Serial No. 543,407.

To all whom it may concern:

Be it known that I, WILLIAM MOORE, a citizen of the United States, residing at Marinette, in the county of Marinette and State of Wisconsin, have invented certain new and useful Improvements in Upright Band-Saw Shingle-Machines, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to improvements in shingle sawing machines using upright band saws.

The principal object of the invention is to provide a simple and practical machine of this character which will automatically saw shingles in a rapid and effective manner, and which may be readily adjusted and controlled without danger to the operator or operators.

Further objects of the invention are to provide an improved means for feeding the shingle bolt to the saw, an improved means for tripping and releasing the shingle bolt, improved means for shifting or reversing the position of the shingle bolt with respect to the saw, improved means for automatically retracting the feed mechanism, and improved means for supporting and adjusting the saw.

With the foregoing and other objects in view, the invention consists of the novel construction, combination and arrangement of parts, hereinafter fully described and claimed and illustrated in the accompanying drawings in which:—

Figure 1 is a top plan view of my improved shingle sawing machine; Fig. 2 is a front elevation with parts broken away and in section; Fig. 3 is a side elevation with parts in section; Figs. 4, 5, 6 and 7, are detail sectional views taken respectively on the planes indicated by the lines 4—4, 5—5, 6—6, and 7—7, in Fig. 1; Fig. 8 is a detail view showing the operation of the trip mechanism of the shingle bolt grippers; Fig. 9 is a detail perspective view of one of the trip members and its support; Fig. 10 is a detail vertical section taken on the plane indicated by the line 10—10 in Fig. 5; Fig. 11 is a detail section taken on the plane indicated by the line 11—11 in Fig. 1; Fig. 12 is a top plan view of the carriage; Fig. 13 is a detail view of the swinging bolt shifting stop and its support; Figs. 14 and 15 are detail sectional views taken on the planes indicated by the lines 14—14 and 15—15 in Fig. 13, and Fig. 16 is a detail sectional view taken on the plane indicated by the line 16—16 in Fig. 1 and showing the adjustment of the relatively stationary bolt shifting stop.

My improved machine comprises a frame consisting of a horizontally disposed front portion 1 on which is mounted a reciprocatory shingle bolt carriage 2, and it also consists of an upright rear portion 3 for supporting the band saw 4. The latter has a double cutting edge so that a shingle will be cut from the bolt on the carriage 2 each time the latter is moved past the saw. The lower portion of the saw passes around a drive wheel 5 fixed to a horizontal drive shaft 6 which may be driven from a suitable source of power by a driving belt 7 or other suitable means. The upper portion of the saw passes around a guiding and stretching wheel 8 arranged on a vertically adjustable shaft 9. The shaft 9 is mounted in bearings on upright posts 10 which are slidable in a tubular guide 11 secured to the frame 3. The posts 10 have internally threaded lower portions for the screw threaded upper ends 13 of the upright shaft 14 swiveled in the frame 3, as shown in Fig. 10. The lower extremities of the screw shafts 14 carry worm gears 15 which mesh with a horizontal worm shaft 16 journaled in suitable bearings on the frame 3 and having at one end a hand wheel 17. It will be seen that when the latter is turned in one direction the screw shafts 14 will be simultaneously rotated to elevate the posts 10 and thereby cause the stretches of the band saw to be drawn taut.

The frame 1 may be of any suitable form and construction and is provided with parallel guideways or tracks 18 for the carriage 2, which latter preferably consists of longitudinal bars 19 united by transverse connecting bars or members 20. To the outermost bar 20 at one end of the carriage are pivotally connected the ends of links 21, which latter have their opposite ends pivotally connected to the upper extremities of slotted levers 22 fulcrumed upon the floor or any other suitable support. The slots in the levers 22 receive pins 23 on crank disks 24 fixed to a transverse shaft 25 driven by means of meshing cog gears 26 from a second transverse shaft 27, see Fig. 1. Slidably but non-rotatably mounted on the shaft 27 is a friction wheel 28 which is shiftable across the face of a friction drive disk 29 by means of a hand lever 30, as shown more

clearly in Fig. 11. The disk 29 is fixed to one end of a longitudinal shaft 31 arranged parallel with the main drive shaft 6 and driven therefrom by means of a belt 32. It will be seen that when the shaft 6 is rotated, its motion will be imparted through the friction gears 28, 29 to the shaft 27, and the motion of the latter will be imparted through the oscillatory levers 22 which reciprocate the carriage 2.

The shingle bolt is adapted to slide on a plurality of supporting bars 33 arranged in the central portion of the carriage 2 and it is moved inwardly on said bars by means of a shiftable feeding head 34 slidably engaged at its ends with grooved guideways 35 arranged upon the innermost connecting bars 20, which latter have rising from their upper edges parallel side plates 36 which guide the bolt in its sliding movement on the bars 33. The inner upright face of the bolt feeding head 34 is angular when viewed from the top, that is, it has two opposite inclines 37, 38, against either of which the bolt may rest. A vertical series of spurs 39 project from the center of the angular or V-shaped inner face of the head 34 and serve to pivotally mount the bolt so that it may be tilted in a horizontal plane against either of the incline faces or surfaces 37, 38, as hereinafter explained. Attached to the outer or front face of the feeding head 34 is a rack bar 40, the rack teeth on the bottom of which mesh with a cog wheel or pinion 41, see Fig. 5, fixed to a transverse shaft 42 rotatably mounted in suitable bearings in the bars 20 of the carriage.

43 denotes a ratchet wheel loosely mounted on the shaft 42 and connected thereto by a coil spring 44 which surrounds said shaft. One end of this spring is fixed to the shaft, and its other end to the ratchet wheel, as shown in Fig. 6. The ratchet wheel 43 is intermittently actuated in a direction to wind up the spring 44 by means of a pawl 45 pivoted to a bell crank lever 46 which is fulcrumed at its angle on the carriage and has upon its long arm an anti-friction roller 47 to run upon a longitudinal track 48 provided on the frame 1. At a suitable point on the track 48 is a cam projection 49 which elevates the roller as the latter passes over it and thereby rocks the lever 46 to cause the pawl 45 to move the ratchet wheel 43 to a distance of one tooth. Retrograde rotation of the ratchet wheel 43 is prevented by a pawl 50 provided on one end of a lever 51 which is fulcrumed intermediate its ends on a bracket 52 secured to the carriage. The other end of the lever 51 is weighted to maintain the pawl 50 in engagement with the ratchet wheel, and said end is provided with an upwardly extending trip arm 53 and a laterally extending arm or projection 54. The trip arm 53 has its upper end disposed beneath the pawl 45 whereby it will elevate the latter when the lever 51 is given sufficient movement in the proper direction. The arm or projection 54 is disposed over a laterally projecting trip plate 55 arranged on a vertically shiftable track bar 56. This track bar is supported and adjusted by means of a pair of parallel link rods 57, 58, which are pivotally connected to each other, as shown in Fig. 2. The upper ends of the rods 57 are pivoted to the track rail or bar 56, while the lower ends of the rods 58 are pivotally mounted on the floor, and the intermediate portions of said rods 58 are connected by a longitudinal shifting bar 59. One end of the latter is connected to an operating lever 60 provided with the usual pawl and ratchet locking device 61. The track rail or bar 56 when elevated is adapted to contact a friction wheel or roller 62 fixed to one end of a shaft 63, the other end of which carries a beveled gear 64 adapted to be moved into mesh with either one of two oppositely arranged beveled gears 65, 66, fixed to the shaft 42. The shaft 63 is journaled in a shiftable bearing 67 slidably mounted on the carriage, as shown in Fig. 1 and adapted to be adjusted by means of a hand lever 68. This lever is provided with a pawl and ratchet locking device and is connected by a link to the bearing 67, as will be readily understood on reference to Figs. 1 and 2.

The shingle bolt is clamped or held stationary on the carriage during the cutting operation by means of a gripping device consisting of two opposing upright gripping jaws 69 which are horizontally slidable in vertical slots formed in the side plates 36. It will be noted that the side plates 36 extend beyond the bolt supporting bars 35, and that the jaws 69 are offset as at 69a to dispose them close to the saw. This construction enables the greatest possible number of shingles to be cut from the bolt and leaves an exceedingly small spalt which when finally released drops downwardly through the space between the saw and the adjacent part of the frame 1, which space is open or unobstructed for the free passage of the spalt. Projecting outwardly from the central portions of the jaws 69 are stems 70 which have a slot and pin connection with the lower ends of upright levers 71 fulcrumed intermediate their ends at 72, see Fig. 4. The upper extremities of the levers 71 are connected to rods 73 slidably mounted in bearings 74 and having their inner ends overlapping and provided with spaced upright extensions or arms 75. The arms 75 are disposed opposite each other and on opposite sides of a pair of anti-friction rollers 76 journaled in a tilting member 77 consisting of united plates and pivoted at 78 on an upright support 79 rising from a

cross bar 80 uniting the upper extremities of the side plates 36. The pivot 78 is arranged centrally between the rollers 76 so that when the member 77 is tilted said rollers will cause the arms 75 to be moved away from each other for the purpose of drawing the rods 73 inwardly, thereby actuating the levers 71 to retract the gripping jaws 69 from the bolt. To permit the tilting member 77 to be actuated its upper end is extended and carries a third antifriction roller 81 which is engaged and actuated by trips 82. Coil springs 83 are arranged on the rods 73 between the levers 71 and the guides 74 for the purpose of projecting the gripping jaws 69 inwardly into engagement with the bolt.

The trips 82 are in the form of arms projecting radially from upright pivots 83 mounted in bearings on upright plates 84 secured to the upright frame 3, see Figs. 1 and 3. The trip arms 82 project normally into the path of the roller 81 and they are adapted to have free swinging movement in one direction but are prevented from swinging in the opposite direction. Stop pins 85 provided on the pivots 83 and adapted to engage the plates 84 limit the swinging movement of said pivots and consequently the trip arms 82 under the action of coil springs 86, which latter maintain the trip arms in normal position, as will be understood on reference to Fig. 9.

The shingle bolt is adapted to be automatically shifted or swung horizontally after each shingle has been cut so as to reverse the position of the bolt with respect to the saw and cause the butt end of each succeeding shingle to be cut from the opposite side of the bolt. This shifting of the shingle bolt is effected by two stops 87, 88, which are engaged by the bolt as the carriage reaches the limit of its movement in one direction, and when the gripping jaws 69 have released the bolt. The stop 87 is arranged on the right hand side of the saw when placing the machine, and is in the form of an upright angular plate against which the bolt is forced and which serves as a cam to swing it on the pivot pins 39 from engagement with the incline surface 38 into engagement with the other incline surface 37 on the bolt feeding head 34. To enable the machine to cut shingles of different sizes, the stop 87 is adjustably mounted by securing it to a rearwardly extending base bar 89 adjustably mounted on a bar 90 forming a part of the frame of the machine. The base 89 is secured at one end to the stop 87, and its other end is connected to the latter by an incline brace 91. In the intermediate portion of the base bar 89 is a longitudinal slot 92 to receive a pivot or bolt 93 in the bar or support 90 so that the base bar 89 and consequently the stop 87 may be swung horizontally and also slid longitudinally. To retain the stop in adjusted position a set screw 94 is arranged in the bar 89 and adapted to impinge against the support or bar 90 as shown. The other stop 88 is substantially the same in construction and is similarly mounted for similar adjustment, but in addition it has other adjustments and peculiarities of construction whereby it may be manipulated to enable two or more succeeding shingles to be cut from the same side of the shingle bolt. This movable or shiftable stop 88 consists of two swinging sections or plates 95, 96, which are hingedly mounted as at 97 on a vertical pivot rod 98. The lower portion of the pivot 98 is fixed by a transverse pin 99 in a horizontally disposed lever 100 and the lower extremity of said pivot is rotatably mounted at 101 in a portion of the frame of the machine to serve as a fulcrum for said lever. One end of the lever 100 extends forwardly to provide a handle 102, and its other end extends rearwardly and carries a curved head 103 to slidably engage a support 104 curved concentrically with the pivot 98, the construction just described serving to take the strain off of the pivot when the shingle bolt engages the stop 88. Leaf springs 105 fixed to the pivot 98 and engaging the rear faces of the plates 95, 96, maintain them in normal position or at an angle to each other, as shown in Fig. 1. These springs are stiff enough to swing the shingle bolt to reverse its position when the stop is set to effect this result but they will permit the plates to yield and allow the shingle bolt to pass when the carriage is on its return movement.

The operation of the machine is as follows: The shingle bolt is placed on the supporting bars 33 of the carriage and in engagement with one of the incline faces 37, 38 of the head 34, and also forced against the pivoting spurs 39, the forward portion of the bolt being held by the gripping jaws 69. When the power is applied to the main drive shaft 6 the band saw will be rotated and movement will be imparted through the gearing above described to the carriage 2, the latter being reciprocated on the guideways or tracks 18. As the shingle bolt moves past the saw the latter will cut a shingle from its end, the shingle being cut from its butt to its tapered end. As the carriage advances to move the shingle bolt against the saw the roller 47 travels on the track 48 and will be elevated by its elevation over the cam 49 on said track, such actuation of the roller 47 serving to swing the lever 46 which in turn causes the pawl 45 to rotate the ratchet wheel 43 in a direction to wind up the spring 44, the ratchet wheel being held against retrograde rotation by the pawl 50. The spring 44 will thus be put under tension, the shaft 42 being held stationary by reason of the engagement

of the rack 40 with its pinion 41 because the rack can not move until the shingle bolt is released by the gripping jaws 69. As the carriage nears the limit of its movement in one direction the roller 81 will engage one of the trip arms 82 and the member 77 will be thereby swung to one side to cause the rollers 76 to spread the upstanding arms 75 of the rods 73. The latter will consequently be drawn toward each other to retract the jaws 69 from engagement with the shingle bolt. When the bolt is thus released the continued movement of the carriage causes it to engage one of the stops 87, 88, which latter will shift it horizontally and cause it to be reversed on the carriage and bolt feeding head 34. The instant the jaws 69 release the bolt it will be forced inwardly by the action of the spring 44, the latter in unwinding causing the shaft 42 to rotate and the pinion 41 on the latter to actuate the rack 40. As the roller 81 passes under said trip arm 82 the springs 83 will return the gripping jaws 69 into engagement with the bolt and will also cause the member 77 to be returned to its normal perpendicular position. When the carriage moves in the opposite direction to bring the shingle bolt against the opposite cutting edge of the saw to cut the next shingle, the roller 81 when it engages the trip arm 82 will swing the latter against the tension of its spring 82 and will consequently pass said trip arm without being shifted and without swinging the member 77. As the carriage reaches the other end of the machine the parts on such end or side will be similarly operated and automatically reverse the shingle bolt on the carriage and advance it forwardly or inwardly toward the saw. When the last shingle has been cut from the bolt, the remaining piece or spalt will drop off of the carriage when the gripping jaws release it. To return or retract the bolt feeding head 34 so that a new bolt may be placed on the carriage, the lever 60 is shifted to cause the parallel toggle links 57, 58, to elevate the friction track rail 56 into engagement with the wheel 62. When this has been done the reciprocatory movement of the carriage will cause the wheel 62 to be rotated and its motion will be imparted through the shaft 63 and beveled gearing shown in Fig. 1 to the shaft 42, the rotary movement of the latter causing the pinion 41 to actuate the rack 40 in a forward direction. As the rail 56 is elevated the projection or lug 55 upon it will engage the arm 54 of the lever 51 and thereby retract the pawl 50 from engagement with the ratchet wheel 43, and also elevate the arm 53 to cause the latter to retract the pawl 45, the shaft 42 being thereby released for free rotary movement. By manipulating the lever 68 to move the beveled gear 64 into mesh with either of the gears 65, 66, the direction of rotation of the shaft 42 may be varied to cause the head 34 to be advanced or receded. By manipulating the lever 30 of the friction gears 28, 29, the speed of the reciprocatory movement of the carriage may be varied. By shifting the lever 102 the position of the stop 88 may be varied so that it will not reverse the positon of the shingle bolt on the carriage, thereby allowing one or more succeeding shingles to be cut from the bolt with their butt ends taken from the same side of the bolt.

If desired, I may mount the shaft 31 of the friction disk 29 for longitudinal sliding movement and provide means for maintaining it in proper frictional contact with the wheel 28, and also for retracting it from engagement with said wheel. This device is shown more clearly in Fig. 2 and comprises an upright lever 110 fulcrumed intermediate its ends at 111 and having a handle at its upper end. The lower end of said lever is forked to loosely receive a grooved collar or sleeve 112 on the shaft 31 so that when said lever is shifted the shaft 31 will be moved longitudinally and at the same time allowed to freely rotate. To maintain the disk 29 in proper frictional contact with the wheel 28 a cord 113 is attached to the lower portion of the lever, passed around a guide pulley 114 and has its other end carrying a weight 115.

While I have shown and described in detail the preferred embodiment of my invention, it will be understood that I do not wish to be limited to the precise construction set forth, since various changes in the form, proportion and arrangement of parts, and in the details of construction, may be resorted to within the spirit and scope of the invention.

Having thus described the invention what is claimed is:

1. In a shingle sawing machine, the combination with a saw, of a reciprocatory carriage, a shingle bolt gripping means on the carriage, means for automatically releasing said gripping means, a slidable bolt feeding head upon the carriage, and a spring actuated device for automatically moving said head when the gripping means releases the bolt.

2. In a shingle sawing machine, the combination with a saw, of a reciprocatory carriage, a shingle bolt gripping means on the carriage, means for automatically releasing said gripping means, a slidable bolt feeding head upon the carriage, means for advancing said head when the gripping means releases the bolt, and means for reversing the bolt when released by said gripping means.

3. In a shingle sawing machine, the combination with a saw, of a reciprocatory carriage, a shingle bolt gripping means on the carriage, means for automatically releasing

said gripping means, a slidable bolt feeding head upon the carriage, a spring device for advancing the head when the gripping means releases the bolt, and means actuated by the reciprocatory movement of the carriage for controlling said spring device.

4. In a shingle sawing machine, the combination with a saw, of a reciprocatory carriage, a shingle bolt gripping means on the carriage, means for automatically releasing said gripping means, a slidable bolt feeding head upon the carriage, a spring device for advancing said head when the bolt is released by the gripping means, means actuated by the reciprocatory movement of the carriage for intermittently operating said spring device, and means for retracting said feeding head.

5. In a shingle sawing machine, the combination with a double edge saw and operating means for the same, of a reciprocatory carriage, a shingle bolt gripping means on said carriage, means for automatically releasing said gripping means from engagement with the bolt, an intermittently actuated bolt feeding means, and stops for engagement by the bolt when released by said gripping means whereby the bolt will be automatically reversed.

6. In a shingle sawing machine, the combination with a double edge saw and operating means for the same, of a reciprocatory carriage, a shingle bolt gripping means on said carriage, means for automatically releasing said gripping means from engagement with the bolt, a slidable bolt feeding head upon the carriage, a spring device for advancing said head when the bolt is released by said gripping means, and stops arranged on the opposite sides of the saw for engagement by the bolt whereby its position will be reversed.

7. In a shingle sawing machine, the combination with a double edge saw and operating means for the same, of a reciprocatory carriage, a shingle bolt gripping means on said carriage, means for automatically releasing said gripping means from engagement with the bolt, means for advancing said head when the bolt is released by the gripping means, and adjustable stops for engagement by the bolt whereby its position on the carriage will be reversed.

8. In a shingle sawing machine, the combination with a saw, of a reciprocatory carriage, a shingle bolt feeding means upon the carriage, a shingle bolt gripping means comprising opposing spring pressed gripping jaws, jaw retracting rods having opposing arms, a swinging member arranged between said arms to force the latter apart, and a trip arm to coact with said swinging member.

9. In a shingle sawing machine, the combination with a saw, of a reciprocatory carriage, automatically operated shingle bolt gripping means, a slidable shingle bolt feeding head upon the carriage, a rack carried by said head, a rotary shaft in the carriage carrying a pinion to mesh with said rack, a ratchet wheel loose on said shaft, a spring connecting said ratchet wheel to said shaft, a pawl to co-act with said ratchet wheel and intermittently actuated by the reciprocatory movement of the carriage to wind up said spring, and means for preventing retrograde rotation of said ratchet wheel.

10. In a shingle sawing machine, the combination with a saw, of a reciprocatory carriage, automatically operated shingle bolt gripping means, a slidable shingle bolt feeding head upon the carriage, a rack carried by said head, a rotary shaft in the carriage carrying a pinion to mesh with said rack, a ratchet wheel loose on said shaft, a spring connecting said ratchet wheel to said shaft, a bell crank on the carriage, a pawl on the bell crank to co-act with said ratchet wheel, a stationary cam arranged in the path of the bell crank for actuating the latter, and a pawl for preventing retrograde rotation of said ratchet wheel.

11. In a shingle sawing machine, the combination with a saw, of a reciprocatory carriage, automatically operated shingle bolt gripping means, a slidable shingle bolt feeding head upon the carriage, a rack carried by said head, a rotary shaft in the carriage carrying a pinion to mesh with said rack, a ratchet wheel loose on said shaft, a spring connecting said ratchet wheel to said shaft, a pawl intermittently operated by the reciprocatory movement of the carriage and adapted to actuate said ratchet wheel to wind up said spring, a pawl to co-act with the ratchet wheel and prevent retrograde rotation of the same, and means for simultaneously retracting said pawls and imparting rotary movement to said shaft.

12. In a shingle sawing machine, the combination with a saw, of a reciprocatory carriage, automatically operated shingle bolt gripping means, a slidable shingle bolt feeding head upon the carriage, a rack carried by said head, a rotary shaft in the carriage carrying a pinion to mesh with said rack, a ratchet wheel loose on said shaft, a spring connecting said ratchet wheel to said shaft, a ratchet mechanism for intermittently rotating the ratchet wheel in the same direction and locking it against retrograde rotation, a shaft journaled upon the carriage and geared to the first mentioned shaft, a friction wheel upon the second mentioned shaft, a retractable friction track rail to be moved into and out of contact with said friction wheel, and means actuated by the movement of said track rail for rendering said ratchet mechanism inoperative.

13. In a shingle sawing machine, the com-

bination with a saw, of a reciprocatory carriage and automatically operated shingle bolt gripping means, means for advancing a shingle bolt on the carriage when released by said gripping means, a relatively stationary adjustable stop on one side of the saw for engagement by the shingle bolt, and an adjustably and pivotally mounted shingle bolt engaging stop on the other side of the saw.

14. In a shingle sawing machine, the combination with a saw, of a reciprocatory carriage and automatically operated shingle bolt gripping means, means for advancing a shingle bolt on the carriage when released by said gripping means, a lever and a shingle bolt engaging stop mounted on and actuated by the lever and consisting of spring pressed sections.

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

WILLIAM MOORE.

Witnesses:
GILBERT FONSTAD,
M. E. KIEFFER.