No. 764,961. PATENTED JULY 12, 1904.

A. L. SHAW.

SHINGLE SAWING MACHINE.

APPLICATION FILED DEC. 17, 1902.

NO MODEL. 3 SHEETS—SHEET 1.

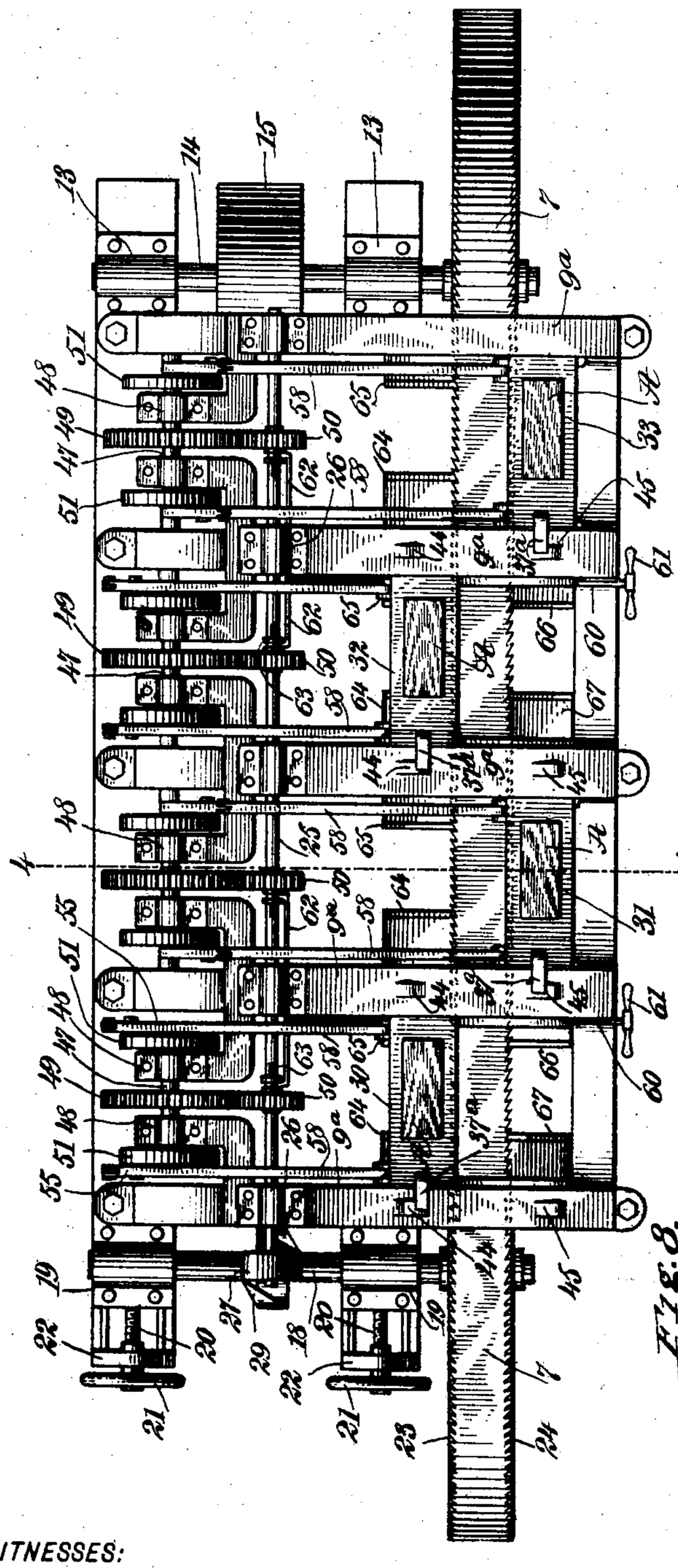

Fig. 1.

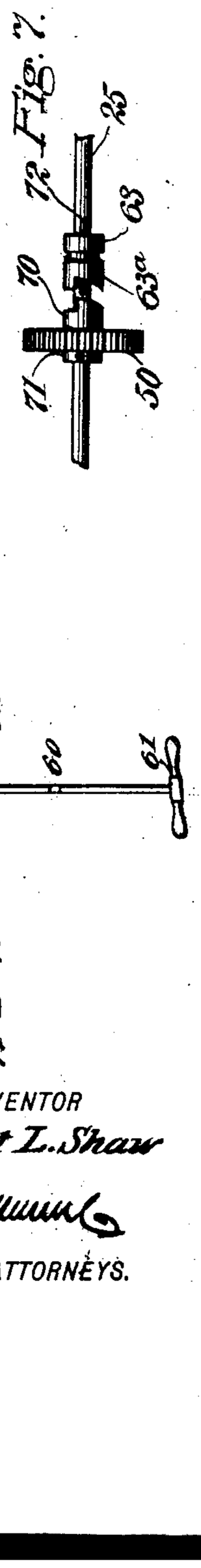

Fig. 7.

Fig. 8.

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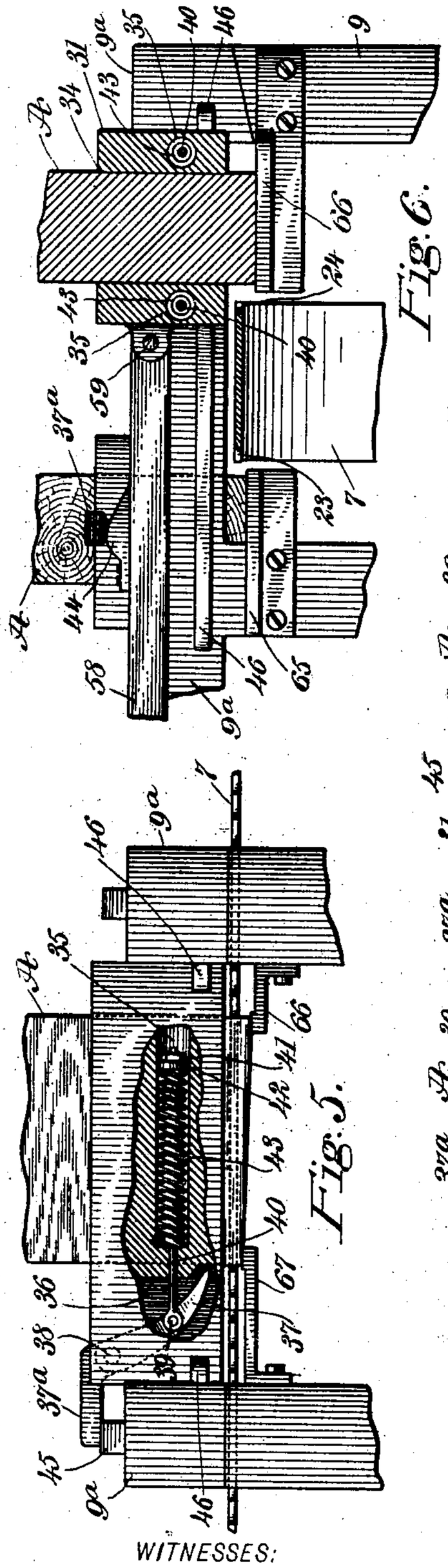

Fig. 6.

Fig. 5.

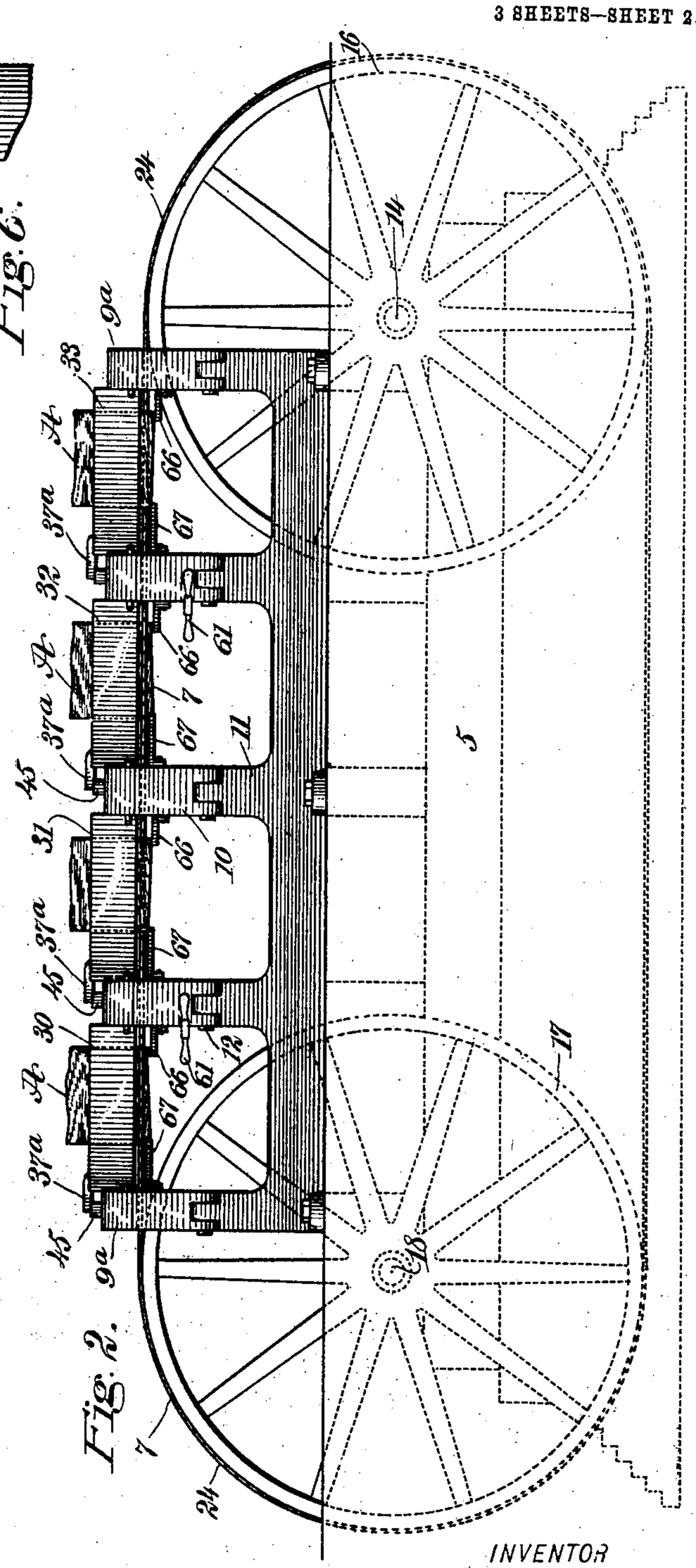

Fig. 2.

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NO MODEL. 3 SHEETS—SHEET 3.

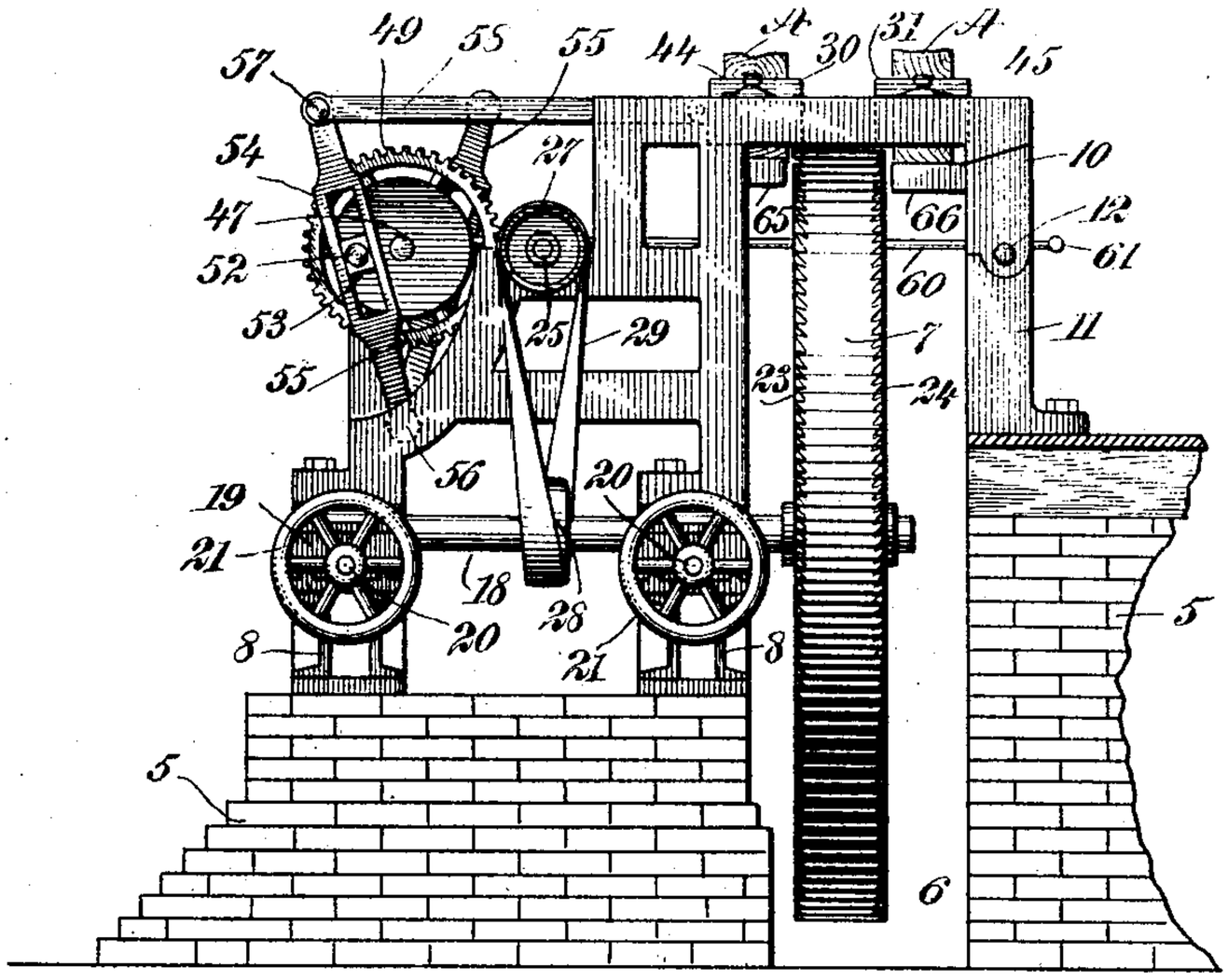

Fig. 3.

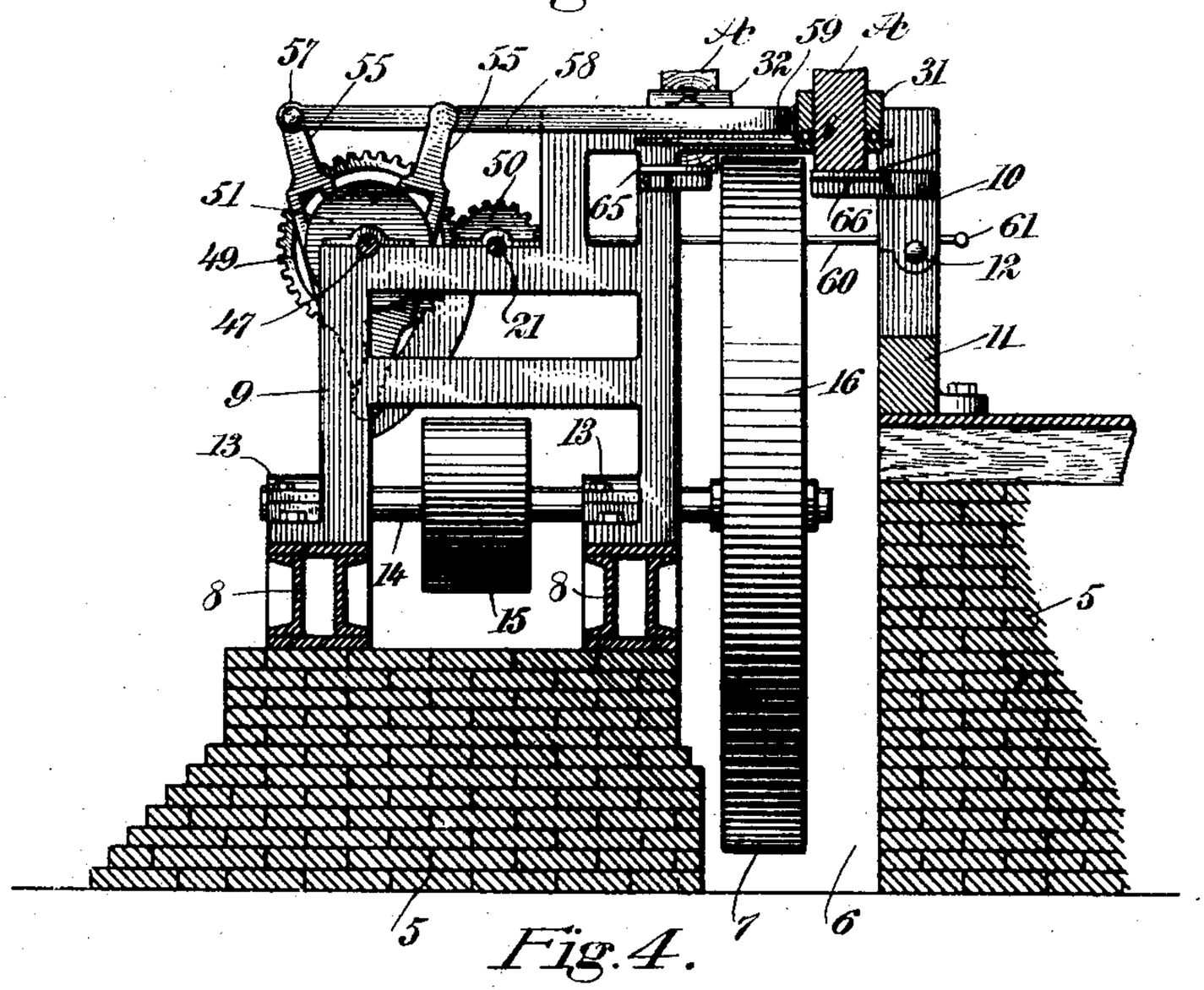

Fig. 4.

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No. 764,961. Patented July 12, 1904.

UNITED STATES PATENT OFFICE.

ALBERT LAWRENCE SHAW, OF WHITECASTLE, LOUISIANA, ASSIGNOR OF SIXTY ONE-HUNDREDTHS TO ROBERT H. DOWNMAN, OF NEW ORLEANS, LOUISIANA.

SHINGLE-SAWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 764,961, dated July 12, 1904.

Application filed December 17, 1902. Serial No. 135,500. (No model.)

To all whom it may concern:

Be it known that I, ALBERT LAWRENCE SHAW, a citizen of the United States, and a resident of Whitecastle, in the parish of Iberville and State of Louisiana, have invented a new and Improved Shingle-Sawing Machine, of which the following is a full, clear, and exact description.

My invention relates to improvements in shingle-sawing machines, in which I aim to saw shingles rapidly and economically to the proper tapering shape and complete them in a smooth condition, so that they have the appearance of being planed, this end being obtained by cutting the bolt or billet of wood lengthwise of the grain. Provision is made for feeding billets of wood to a double-edge band-saw in a way to equalize the resistance on opposite sides, and thereby keep the band-saw on its supporting and driving wheels. Each bolt or billet is clamped in a reciprocatory carriage during the cutting operation through the agency of proper clamping devices, which are housed, and thereby protected against accumulation of dust, splinters, and other refuse. Said clamping devices are automatically released to drop the bolt or billet at the end of each stroke of the carriage, and the billet is adapted to rest on ledges of novel form which determine the inclination of the lower or under face of the billet, thus dispensing with a tilting device and enabling the parts to operate in a way which permits the billet to remain in a substantially vertical position. The carriages are exposed for convenient access, and provision is also made for obtaining access to the band-saw to remove it from or replace it on the band-wheels.

Further objects and advantages of the invention will appear in the course of the subjoined description and the novelty will be defined by the annexed claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a plan view of a shingle-sawing machine constructed in accordance with my invention. Fig. 2 is a front elevation thereof. Fig. 3 is an end elevation looking at the left-hand end of Fig. 1. Fig. 4 is a vertical transverse section taken in the plane of the dotted line 4 4 of Fig. 1 and looking in the direction of the arrow. Fig. 5 is an enlarged detail view, in side elevation, of one of the reciprocatory carriages and the parts associated therewith, also showing a portion of the framework and a part of the endless band-saw. Fig. 6 is a vertical transverse section through the carriage and its associated parts on the same scale as Fig. 5; and Fig. 7 is a detail view of a part of one shaft, a gear thereon, and a clutch for making the gear fast with the shaft. Fig. 8 is a detail view of one embodiment of means for shifting the clutches for adjacent billet-carriages.

The foundation 5 is constructed to provide a saw-pit 6, which accommodates an endless band-saw 7, to be hereinafter more fully described. On a part of this foundation 5 are secured the metallic sills 8, which form a stable support for the main carrying-frame 9, the latter being of any suitable or preferred construction and bolted solidly to the sills. This frame 9 is provided at one side with a removable section 10, which is preferably bolted in place, and to this removable section is hinged an adjustable frame member 11, the latter being pivotally connected to the frame member 10, as at 12, and adapted to be secured solidly to a part of the foundation 5. (See Figs. 3 and 4.) This construction permits ready access to the band-saw 7 in placing it on its supporting and driving wheels or in removing the saw from said wheels.

The frame is provided at one end with suitable shaft-bearings 13, which accommodate a main shaft 14, having a belt-pulley 15, the latter adapted to receive a belt, (not shown,) which may be driven from a line-shaft or other source of power. This shaft 14 is also equipped with a band-wheel 16, which is disposed in alinement with another band-wheel 17, that lies at the opposite end of the main frame, said band-wheels 16 17 lying partly within the pit 6. The band-wheel 17 is secured rigidly to a counter-shaft 18, which is mounted in bearings 19, that are slidably sup-

ported at the opposite end of the frame from the stationary shaft-bearings 13. These slidable shaft-bearings are associated with adjusting-screws 20, having hand-wheels 21, said screws being mounted in suitable stationary supports 22 on the frame or the foundation. The screws may be rotated in one direction or the other to impart the desired slidable adjustment to the bearings 19 and to the counter-shaft 18, and these devices provide for the adjustment of the shaft 18 and the band-wheel 17 with relation to the companion band-wheel 16 and the shaft 14, whereby the band-saw 7 may be strained longitudinally to place it under proper tension, or the band-wheels may be adjusted with relation one to the other for the purpose of fitting the band-saw to said wheels or removing it therefrom.

The faces of the band-wheels 16 17 are not as wide as the band-saw 7, which is fitted snugly to the wheels, and this saw is provided on its edges with the series of teeth 23 24, said series of teeth inclining in opposite directions and constituting a double cutting edge. The motion of the shaft 14 is transmitted by the endless band-saw to the shaft 18, which is thus positively driven, said endless saw constituting a belt to transmit the motion from one shaft to the other, and the shaft 18 is operatively connected to an intermediate shaft 25, the latter serving to impart motion to devices which operate to give reciprocating motion simultaneously to a series of billet-carriages. The shaft 25 is arranged in a horizontal elevated position on the main frame 9 and at one side of and parallel to the endless band-saw, said shaft being supported in suitable bearings 26, which are secured directly to the main frame. At one end this shaft is equipped with a pulley 27, which lies directly over a pulley 28, attached to the counter-shaft 18, and these pulleys are operatively connected by an endless belt 29, as shown more clearly by Figs. 1 and 3, the belt serving to transmit the motion from the counter-shaft 18 directly to the horizontal intermediate shaft 25, which lies at right angles to said shaft 18.

The upper part of the main frame 9 is skeletonized by the provision of a series of horizontal parallel bars 9^a, on which are secured the shaft-bearings 26 of the series to accommodate the intermediate shaft 25, and between these horizontal bars of said frame are disposed the reciprocatory carriages 30 31 32 33. I have shown the machine equipped with a series of four carriages, which are slidably confined between the top bars of the frame in positions to traverse the upper lead of the endless band-saw, and these carriages are driven so that adjacent carriages of the pairs move in opposite directions simultaneously—that is to say, the carriages 30 32 move in one direction across the band-saw, while the carriages 31 33 move in an opposite direction across the band-saw, all of the carriages being driven at one time. Each carriage of the series may be constructed in any suitable way to carry a block or billet of wood, (indicated at A in the several figures of the drawings;) but I prefer to make each carriage with a vertical socket 34, said socket opening through the upper and lower sides of the carriage and being of such dimensions that the billet A will fit loosely therein, so as to be capable of feeding itself by gravity in a downward direction, said billet having a certain limited amount of play within the socket 34 of the carriage in order that the billet may drop more at one end than at the other on the back-and-forth movements of the carriage, whereby a shingle of the proper tapering shape may be cut by one edge or the other of the double-edged endless band-saw on each stroke of the carriage.

The billet-carriage is provided on opposite sides of its socket 34 with chambers 35, as shown more clearly by Figs. 5 and 6, and at one end of the carriage is formed another chamber 36, said chambers of the carriage being adapted to contain the parts of the clamping device which hold the billet A in a stationary position during the travel of the carriage in either direction. The chamber 36 at the end of each carriage has communication with the billet-socket 34, and in this chamber is arranged a clamping-jaw 37. In the preferred form of the clamping-jaw for each carriage it is hung or pivoted near its upper end on a bolt or pin 38, and this jaw is curved, as shown by Fig. 5, in order that its operative end may project into the socket 34 and engage with an end portion of the billet A at a line above the lower face of the carriage and the upper active lead of the endless band-saw 7. The clamping-jaw 37 is as wide as the billet, or substantially so, and to the side portions of said jaw, above the lower active end thereof, are pivoted, as at 39, the end portions of the tension-rods 40, one of which is shown by Fig. 5, and the pair of rods is indicated in Fig. 6. These rods are slidably supported in the carriage and extend into the side chambers 35. The free ends of the rods are provided with nuts 41 and washers 42, and on said rods are fitted the coiled tension-springs 43, one spring being disposed in each chamber 35, so as to have one end seated against the washer 42, while the other end is seated against an end wall of the chamber, as shown by Fig. 5. The energy of the springs 43 is exerted on the tension-rods 40 to normally pull the clamping-jaw 37 into engagement with the billet A, whereby the latter is clamped steadily and securely in the carriage as it reciprocates across the path of the endless band-saw.

Each clamping-jaw 37 is provided with a finger 37^a, which is extended above the carriage and beyond one end of the latter, said finger being disposed over one of the upper

horizontal bars 9^a of the frame. Each bar 9^a is equipped with two cam-surfaces 44 45, which are spaced a proper distance from each other to lie on opposite sides of the plane of the band-saw. Each cam-surface is in the form of a wedge having an inclined upper face, as shown more clearly by Fig. 6, and the cam-surfaces 44 45 are disposed in reverse order, so that the active surfaces thereof incline toward each other. These cam-surfaces lie in the path of the finger 37^a, forming a part of the hinged clamping-jaw, and as the carriage moves in one direction beyond one cutting edge of the saw 7 the finger 37^a is adapted to ride on the cam-surface 44; but when the carriage moves in an opposite direction and beyond the opposite edge of the saw said finger 37^a is adapted to ride on the other cam-surface 45, whereby the clamping-jaw is positively released against the tension of the springs as the carriage reaches the limit of its movement in either direction, whereupon the billet drops on the bars.

Each carriage of the series is slidably confined by guideways between the bars 9^a of the framework, and in Fig. 5 the guideways are shown in the form of ribs 46, which are made fast with the opposing sides of adjacent rails 9^a and are adapted to fit in suitable grooves which are provided in the ends of the carriage. Each carriage is furthermore driven by means which impart reciprocating motion to the carriage in a path across the band-saw, and in one embodiment of this carriage-driving mechanism I employ a short horizontal driving-shaft 47 for each carriage. A series of these horizontal shafts 47 for the several carriages of the series are employed at one side of the framework, and these shafts are independently journaled in pairs of bearings 48, which are fixed to the framework in a manner to support the short shafts 47 in alined relation longitudinally of the machine, said shafts lying at one side of and parallel to the intermediate shaft 25, as shown by the drawings. Each shaft 47 is provided between the bearings 48 with a spur-gear 49, having intermeshing engagement with a spur-pinion 50, the latter being loose on the shaft 25 to be made fast therewith by a clutch 63, which is slidable lengthwise on the shaft, as will be presently described. Each short shaft 47 is furthermore provided with a pair of crank-disks 51, each of which are provided with wrist-pins 52, said wrist-pins being placed in corresponding positions on the crank-disks of each pair. As shown by Fig. 3, each wrist-pin 52 is loosely fitted in a slidable block 53, that is arranged to travel in a slot 54 of one lever of a pair 55. The levers 55 of each pair are disposed on opposite sides of the crank-disks 51, and these crank-disks are in turn on opposite sides of the spur-gear 49. Said levers 55 are fulcrumed at their lower ends on the frame, as at 56, and to the upper ends of said levers are pivoted, as at 57, the pair of links 58, said links being disposed in substantially horizontal positions and connected pivotally at 59 to one carriage at the end portions thereof.

The motion of the shaft 25 is transmitted by the intermeshing gears 49 50 to the shaft 47, which rotates the pair of crank-disks 51, and these disks operate the levers 55, which act, through the links 58, to impart the desired slidable movement to the carriage which moves the billet of wood A. The wrist-pins 52 of the crank-disks, which drive one carriage 30, are set on a center different from the wrist-pins of the crank-disks which guide the adjacent carriage 31, and these parts of the driving devices for adjacent carriages, such as 30 31 or 32 33, are placed on opposite centers with a view to simultaneously moving the adjacent carriages in opposite directions. It is to be understood, therefore, that the carriages 30 32 move in a forward direction at the same time that the carriages 31 33 move in an opposite direction, and the billets of wood in the pairs of adjacent carriages are therefore presented simultaneously to opposite sides of the double-acting endless band-saw 7, whereby the resistance or pressure on the active edges of the band-saw is equalized, and said band-saw is kept or retained in proper operative position on its supporting-wheels 16 17.

The gear-pinions 50 of the driving devices for adjacent carriages which move in opposite directions, such as the carriages 30 31, are adapted to be simultaneously shifted out of mesh with the spur-gears 49 on adjacent shafts 47, and in one form of this adjusting mechanism I employ a rod or spindle 60, having a suitable handle or wheel 61 and supported in a horizontal position on the frame below the carriages. The inner end of this rod or spindle 60 is provided with outwardly-extending members 62, as shown more clearly by Fig. 8, which are fitted loosely in grooved hubs of the clutches 63, and when this spindle 60 is turned the members 62 operate to simultaneously shift the adjacent pair of clutches 63, thus throwing the driving devices of the two carriages out of operation. I would have it understood, however, that I may employ means for individually adjusting the carriage-driving devices out of gear with the intermediate shaft 25.

Below each carriage of the series I employ a set of stationary ledges forming cut-gaging devices on which the bolt or billet is adapted to rest, as shown by the several figures in the drawings. A set of ledges associated with each reciprocatory carriage comprises four ledges arranged to support the billet at the butt and point ends. The four ledges are indicated at 64, 65, 66, and 67, and of these ledges those indicated at 64 and 65 constitute one pair, while the other ledges, 66 and 67, are the other pair. The respective pairs of ledges 64 65 and 66 67 lie on opposite sides of the band-saw and

are supported by the framework directly below the carriage and in the path of the billet which is supported therein. The ledges 64 65 are arranged in different horizontal planes, and the same is true of the ledges 66 67 of the other pair. The ledge 64 is adapted to support one end of the billet in a lower position than the ledge 65 of the same pair, while the ledge 66 supports one end of the billet in a lower position than the ledge 67 of the other pair. (See Figs. 2 and 5.)

For the purpose of convenience in designating the different ledges I will refer to the ledges 64 66 as the "butt-supporting" ledges, while the other ledges, 65 67, are the point-supporting ledges, and by reference to Fig. 1 it will be noted that the butt-ledges 64 66 of the pairs are disposed in reversed positions, and the same is true of the point-ledges 65 67 of the pairs—that is to say, the butt-ledges 64 66 are on opposite sides of the transverse axis of the carriage and are likewise on opposite sides of the band-saw, the same arrangement being true of the point-ledges 65 67.

As the carriage reaches the limit of its movement in one direction after a shingle has been cut from the lower end of the billet the clamping-jaw 37 is released by the means described and the billet drops a short distance, equal to the thickness of the shingle. As the billet drops it rests upon the ledges 64 65, which, as before mentioned, are in different horizontal planes, and the lower face of the billet is thus given an inclination, as shown by Fig. 5. When the carriage moves in the opposite direction, the billet travels therewith and one edge of the saw cuts a shingle from the lower end of the billet, the latter being held in a fixed position by the spring-controlled jaw during the cutting operation; but when the carriage reaches the limit of its movement in said direction and assumes a position over the other pair of ledges, 66 67, the clamping-jaw is again released and the billet again drops. At this time the billet rests on the ledges 66 67, so that the previously lowermost end of the billet when resting on the ledges 64 65 will now be held in a higher position by the ledge 67 of the pair of ledges 66 67. The carriage now moves in a reverse direction to carry the billet against the other active edge of the saw, which cuts another shingle from the billet, the last-mentioned shingle having a reverse taper to the shingle which was previously cut therefrom, and when the carriage arrives over the ledges 64 65 the clamping-jaw is again released and the billet drops the thickness of another shingle, so as to rest on the ledges 64 65, this operation being repeated indefinitely.

The operation of the machine may be described as follows: The billets A are first prepared, and they are inserted in the sockets 34 of the series of carriages in positions for the lower ends thereof to project below the carriages and to rest on the proper ledges of the pairs provided in connection with the several carriages. The billets are clamped in place by the spring-pressed jaws 37 of the several carriages, and said billets of adjacent carriages are on opposite sides of the double-edged band-saw. The machine is driven by a belt fitting the pulley 15, which drives the shaft 14 to propel the endless saw 7, the latter rotating the counter-shaft 18, which in turn drives the shaft 25, and the latter drives the shafts 37, that propel the carriages. The carriages 30 32 move in opposite directions to the carriages 31 33 in order to present two of the billets to one cutting edge of the saw, while the remaining billets are presented simultaneously to the opposite edge of the saw, and as said saw is positively driven in the direction of its length the two cutting edges thereof operate on the billets in a way to sever four shingles from the billets during one traversing movement of the series of carriages. It will be understood that when the carriages complete one traversing movement relative to the saw the billets are released and drop on the proper ledges, which determine the inclination of the under faces of the billets; but when the carriages are driven again the billets are clamped by the jaws, and they are again cut by the action of the double-edged saw.

In Fig. 7 I have shown a part of the intermediate shaft 25 and one of the gears 50 thereon, said gear being loose on the shaft and provided on one side with a shouldered clutch-face 70. The gear is prevented from moving slidably in one direction by a collar 71, which is secured firmly to the shaft, and the clutch-face of this gear is in opposing relation to a coöperating shouldered face 63^a of the slidable clutch 63, the latter being keyed at 72 on the shaft. The faces 70 63^a of each pinion and its clutch are so disposed that they will interlock one with the other at such a time as to move the carriage in the proper direction at the proper period, thus insuring the desired reciprocation of one carriage relative to the other carriage in the described manner.

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

1. A shingle-sawing machine having a series of slidable carriages arranged side by side and movable in parallel paths, a double-edged band-saw movable at an angle across the paths of said carriages, and driving devices connected operatively with said carriages and operable in moving adjacent carriages of each pair in opposite directions simultaneously; one half the series of carriages moving in one direction across the saw simultaneously with the movement of the remaining half of the series of carriages in an opposite direction across said saw, each of said carriages moving beyond

the saw in each direction, so that the material carried thereby is cut on both the forward and backward movement of the carriage.

2. A shingle-sawing machine having a series of billet-carriages arranged side by side and each limited to rectilinear movement in a path parallel to that of the remaining carriages of the series, a double-edged band-saw movable at an angle across the path of the carriages, driving devices connected operatively with said carriages for simultaneously moving one half of the series in one direction across the saw and the remaining half of the series in an opposite direction across said saw, each carriage moving beyond the saw in each direction so that the material is cut on both the forward and backward movement, and cut-gaging devices located on opposite sides of the band-saw and below each carriage of the series for canting a billet in each carriage alternately in opposite directions.

3. A shingle-sawing machine having a series of billet-carriages arranged side by side and each limited to rectilinear movement in a path parallel to that of the other carriages of the series, a double-edged band-saw movable across the paths of the billet-carriages, and driving devices for simultaneously moving billet-carriages of each pair in opposite directions; said driving devices including shafts, crank-disks on the shafts, and levers connected to said crank-disks and to the carriages, each of said carriages moving beyond the saw in each direction so that the billet is cut on both the forward and backward movement.

4. A shingle-sawing machine having a series of billet-carriages each limited to movement in a rectilinear path parallel to that of the other carriages of the series, a double-edged band-saw movable across the paths of said carriages, a series of carriage-driving shafts each having crank-disks at its end portions and a driving-gear, levers connected individually to said crank-disks and linked to said carriages, and a shaft having gears meshing with said gears of the carriage-driving shafts for rotating the latter; the billet-carriages of each pair being movable in opposite directions simultaneously across the saw by said trains of driving devices formed by the shafts, crank-disks and levers, each of said carriages moving beyond the saw in each direction so as to cut the billet on both the forward and backward movement.

5. In a shingle-sawing machine, a double-edged band-saw, a billet-carriage movable beyond the saw in each direction so that the material is cut on both the forward and backward movement, the said carriage having a billet-socket and separate spring-chambers disposed on opposite sides of the billet-socket, a jaw pivotally mounted on said carriage and operating in the billet-socket, the said jaw being provided with a finger, rods pivotally connected with the jaw and extending into the spring-chambers, springs housed in said chambers and exerting tension on said rods, and tappet devices located on opposite sides of the band-saw and in the path of the finger of the jaw for retracting the jaw in opposition to the tension of the springs when the carriage reaches the limit of its movement in either direction.

6. A shingle-sawing machine having a series of billet-carriages each limited to rectilinear movement in a path parallel to that of the other carriages of the series, each carriage having a billet-socket, a double-edged band-saw movable across the paths of said carriages, a clamping-jaw pivoted on each carriage and having a laterally-extended finger, a spring carried by each carriage and connected to the jaw thereof for moving the same normally into the billet-socket, stationary releasing-cams disposed in the path of the finger of each jaw, billet cut-gaging devices below each carriage, and on both sides of the saw, and driving devices connected with said carriages for moving the carriages in pairs in opposite directions and across the band-saw simultaneously, each of said carriages moving beyond the saw in each direction so that the billet is cut on both the forward and back movement of the carriage.

7. A shingle-sawing machine having a series of reciprocating carriages movable in parallel paths, each carriage having a billet-socket, a double-edged band-saw, a clamping-jaw pivoted in each carriage for reciprocating movement therewith, a finger movable with each jaw, a spring mounted in each carriage and connected to the jaw, a set of stationary releasing-cams for releasing the jaw at the limit of movement of each carriage in each direction, said cams of the set being disposed reversely to each other and in the path of the finger of one jaw, and driving devices for moving the carriages in pairs in opposite directions and across the saw simultaneously, each carriage moving beyond the saw in each direction so that the cut is made on both the forward and back movement.

8. A shingle-sawing machine comprising a frame having a series of parallel guideways, a series of billet-carriages connected alternately in sets, and movable in said guideways, a double-edged band-saw movable across the paths of the carriages, driving devices for reciprocating the sets of carriages in opposite directions and across the saw simultaneously, each of said carriages being moved beyond the saw in each direction so as to cut the billet on both the forward and back movement of the carriage, sets of stationary ledges below the path of each carriage and lying at the limit of the travel of the carriages in each direction, the ledges being arranged to cant the billets alternately in opposite directions, billet-clamps

carried by the carriages, and means for releasing the billet-clamps as the carriages move over the sets of ledges.

9. A shingle-sawing machine having a series of billet-carriages limited to rectilinear movement in parallel paths, a double-edged band-saw movable across the paths of the carriages, and driving devices for positively impelling the carriages in pairs in opposite directions and simultaneously across the saw, each carriage moving beyond the saw in each direction so as to cut the billet on both forward and back travel.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ALBERT LAWRENCE SHAW.

Witnesses:

F. S. BROWN,

R. B. SPOFFORD.