W. E. HARMON.

SAWING MACHINE.

APPLICATION FILED FEB. 6, 1914.

1,197,482.

Patented Sept. 5, 1916.

5 SHEETS—SHEET 1.

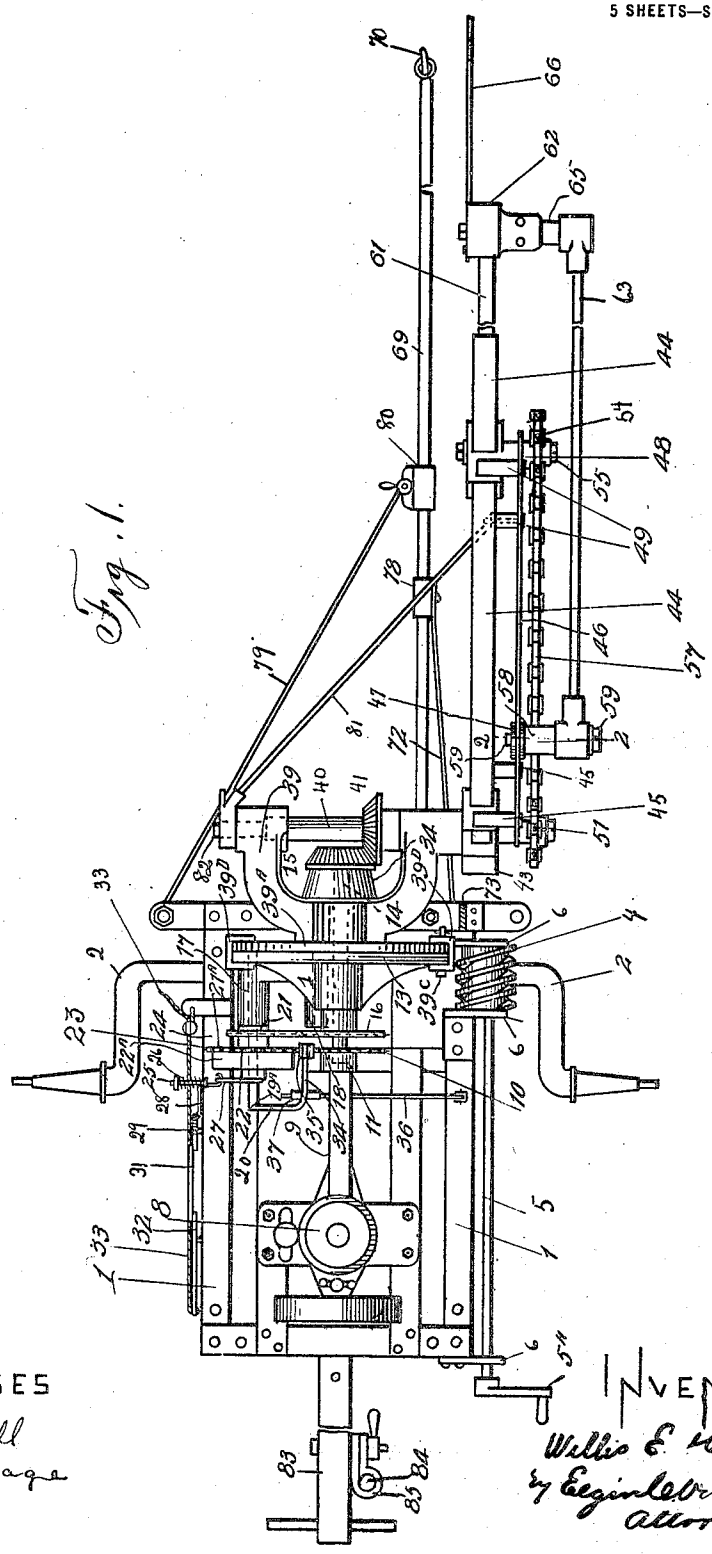


Fig. 1.

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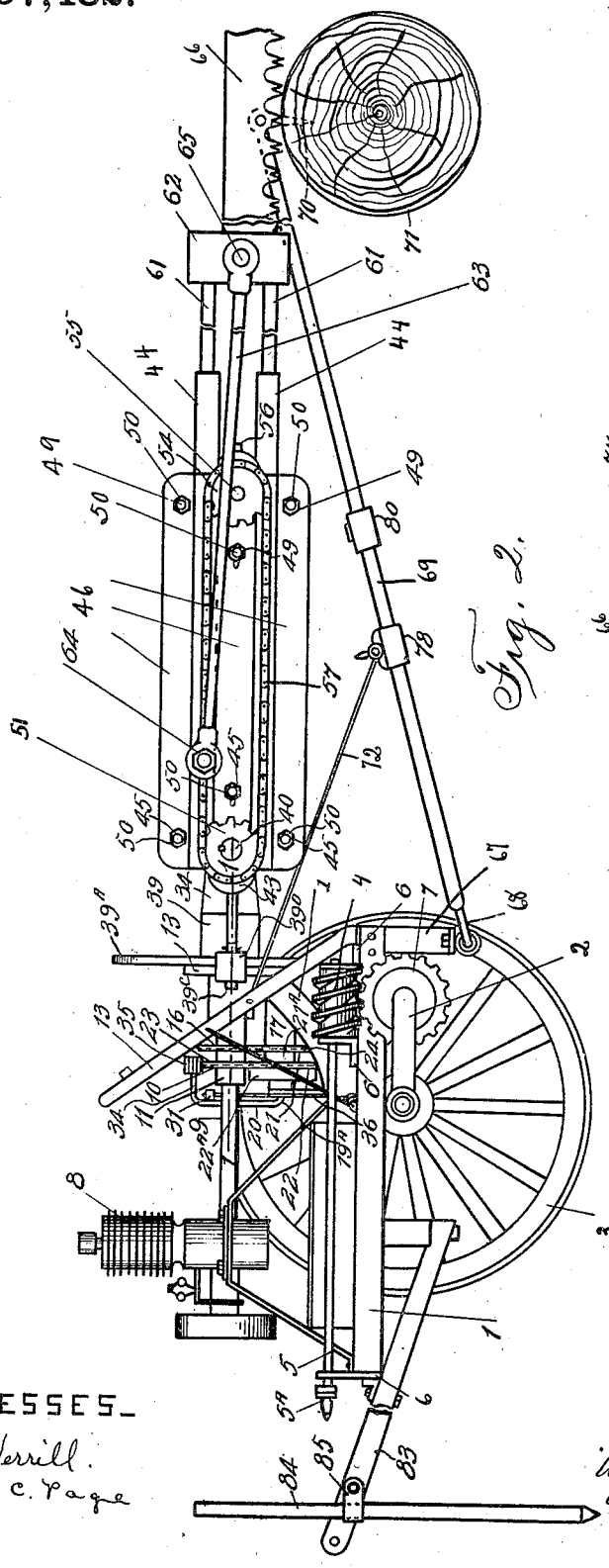


Fig. 2.

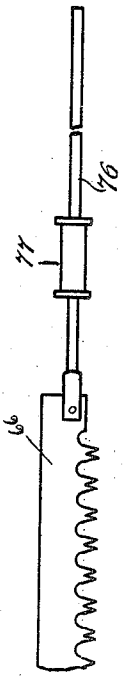


Fig. 3.

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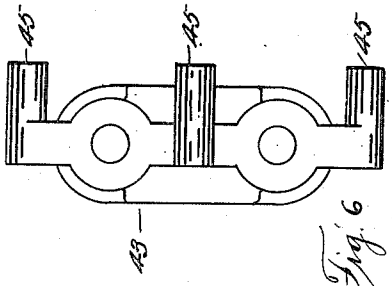


Fig. 6.

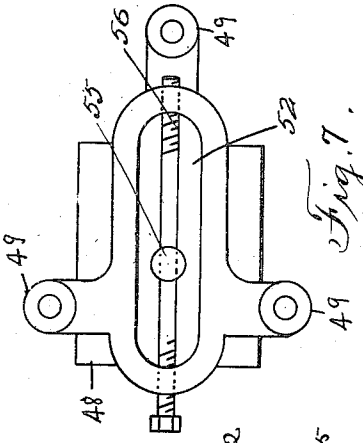


Fig. 7.

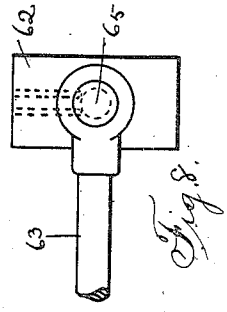


Fig. 8.

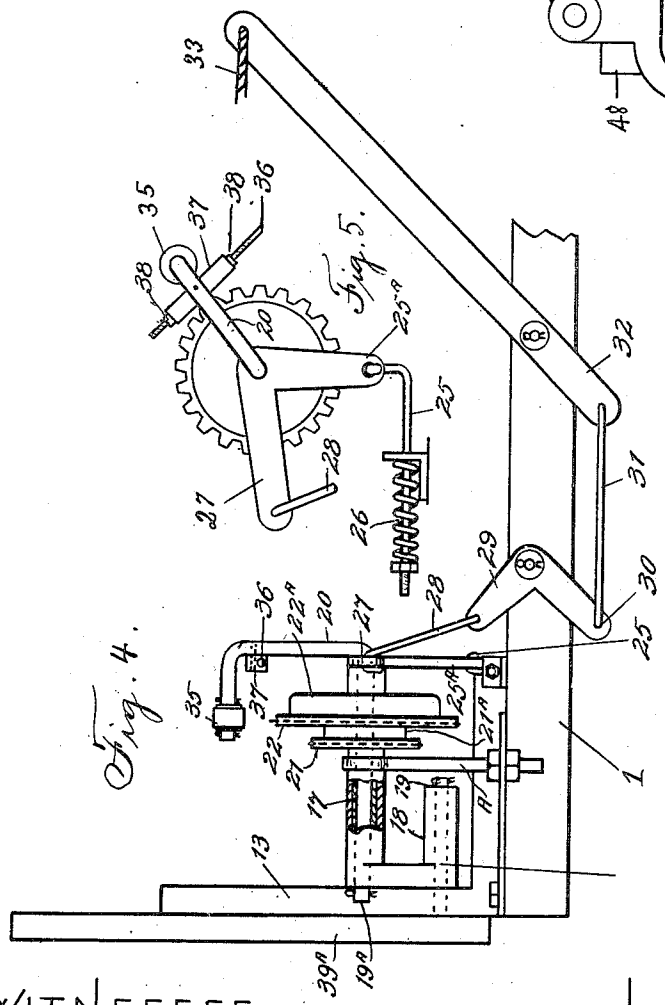


Fig. 4.

Fig. 5.

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5 SHEETS—SHEET 4.

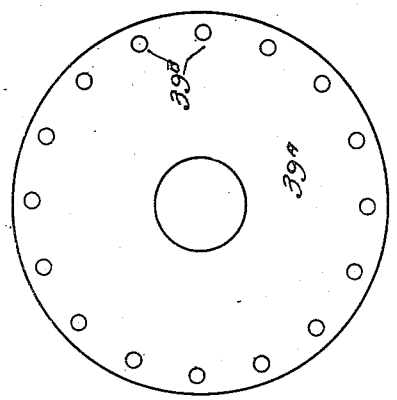


Fig. 11.

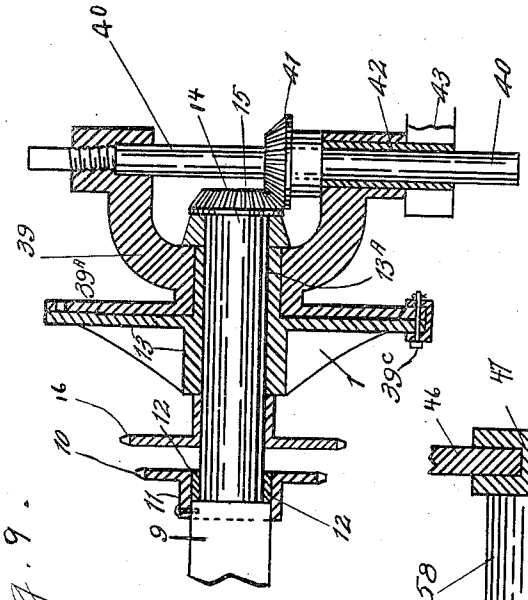


Fig. 9.

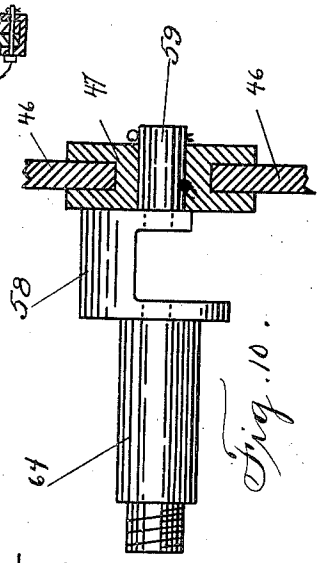


Fig. 10.

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5 SHEETS—SHEET 5.

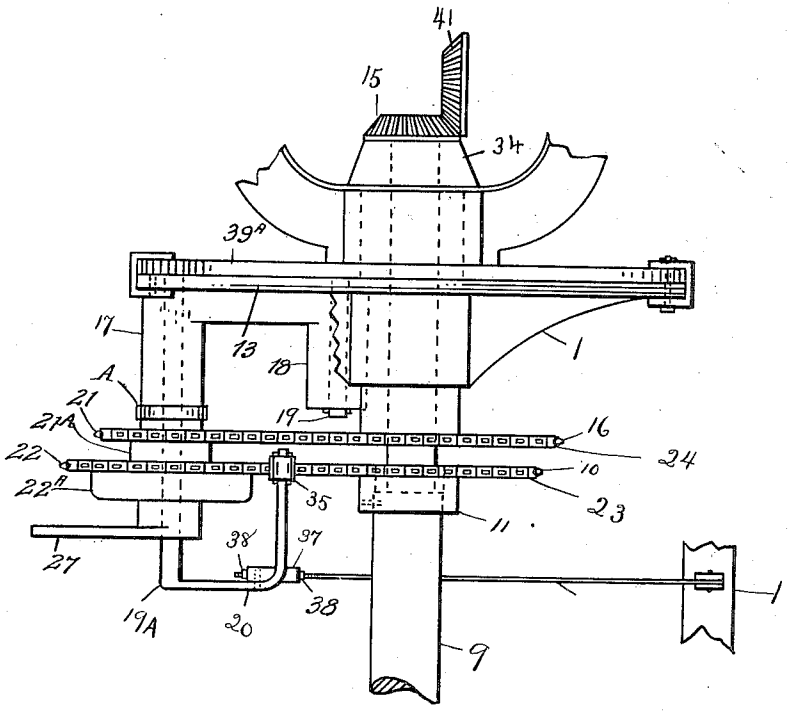


Fig. 12.

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UNITED STATES PATENT OFFICE.

WILLIS E. HARMON, OF MECHANIC FALLS, MAINE.

SAWING-MACHINE.

1,197,482. Specification of Letters Patent. Patented Sept. 5, 1916.

Application filed February 6, 1914. Serial No. 817,040.

To all whom it may concern:

Be it known that I, WILLIS E. HARMON, a citizen of the United States, residing at Mechanic Falls, in the county of Androscoggin and State of Maine, have invented certain new and useful Improvements in Sawing-Machines, of which the following is a specification.

This invention relates to sawing machines. It can be readily mounted upon wheels or hub runners, thus adapting it for use on dirt or snow. It has a drop axle and means for adjusting the height of the main frame. The saw is adapted to operate at any angle so as to fell trees and to cut them up, and in the latter case, equally well at whatever angle to the ground the tree may lie.

In the drawings herewith accompanying and making a part of this application, Figure 1 is a plan view of the main features of the machine; Figs. 2 and 3 form together a side elevation of the same; Fig. 4 is a detail view showing the clutch and its operating mechanism, the view being taken on the opposite side of the machine from that shown in Fig. 2; Fig. 5 is a detail view of the clutch and means for holding it yieldingly out of action; Fig. 6 is a detail rear edge view of one of the castings which supports the saw driving sprocket; Fig. 7 is a detail plan view of the casting which supports the other saw driving sprocket, showing means of adjusting the position of the sprocket to vary the tension of the sprocket chain; Fig. 8 is an enlarged detail of the head of the connecting rod which drives the saw; Fig. 9 is a detail in horizontal section of Fig. 2 taken on line 1—1; Fig. 10 is a detail partly in section taken on line 2—2, Fig. 1; Fig. 11 is an elevation of the circular plate on the saw frame supporting bracket for holding the saw frame at the proper angle and Fig. 12 is an enlarged detail plan view showing arrangement of the power transmitting mechanism.

Same reference characters indicate like parts in the several figures.

In said drawings, 1 is the main frame which is mounted upon a drop axle 2 adapted to be supported in wheels 3 or hub runners not shown, the wheel mount being shown in Fig. 1. The main frame is adjustable vertically by means of a worm 4 on a rod 5 mounted in brackets 6 on frame 1 and meshing with a gear 7 on the axle. Rod 5 has a crank 5^A and the turning of the worm causes the main frame to rise or fall.

Mounted on the frame is a motor 8 having a drive shaft 9. Keyed on the end of shaft 9 is a sprocket 10 having a hub 11 in which is a bushing 12.

Rotatably mounted in an upright flange 13 rigid with the frame and in bushing 12 is a shaft 14 concentric with the motor shaft which shaft 14 extends beyond said flange and terminates in a bevel gear 15. The motor shaft 9 carries a sprocket 16 keyed thereon. Pivotally mounted on a pivot bar 19 secured to the upright flange 13 is one arm 18 of a U-shaped bracket. In the other arm 17 of this bracket is rotatably mounted a shaft 19^A. The arm 17 is supported by a post A, mounted in the frame. On said shaft 19^A are mounted two clutch members 21^A and 22^A having sprockets 21 and 22 respectively. The sprocket 22 is connected to sprocket 10 on the motor shaft by sprocket chain 23, and sprocket 21 is connected to the sprocket 16 on shaft 14 by chain 24. The sprockets 21 and 16 are idle when the clutch is inoperative. The clutch may be a common multiple disk clutch, the mechanism of which is within the cases and not shown in detail. The clutch operating mechanism is particularly shown in Figs. 4 and 5. The clutch members 21^A and 22^A are thrown into and out of engagement by a clutch operating angle lever, one arm 25^A of which carries a rod 25 upon which is a spring 26, the tension of which is sufficient to turn the angle lever to throw out the clutch and hold it out. The other arm 27 of said angle lever is provided with a link 28 connected with an arm 29 of an angle lever pivoted on the main frame, the other arm 30 being connected by a link 31 to one end of the clutch operating lever 32. This lever 32 is pivoted to the main frame and for convenience has a rope 33 attached to the end thereof and long enough to extend to the position of the sawyer and by means of which he can throw the clutch in and hold it in while sawing. When the clutch lever is released it is automatically thrown out by spring 26. The shaft 19^A has a double bent arm 20 which carries a tension roll 35 adapted to bear on sprocket chain 23, increasing or decreasing its tension according as the arm 20 is turned.

The arm 20 is supported by a brace 36, one end pivotally attached to the frame and the

other threaded and extended through a block 37 pivotally attached to the arm. The brace is movable in the block and is held in any desired position relative to the arm by means of nuts 38 on the brace above and below the block. Rotatably mounted on said extension 13^A of the flange 13 is a forked bracket 39 having a vertical circular head 39^A provided with a series of holes 39^B near the periphery whereby it can be locked to flange 13 at any desired angle by a pin 39^C. U-shaped irons 39^D serve as clamps to hold the bracket 39 in place. Bracket 39 extends to back of beveled gear 15 as seen at 34.

In bracket 39 is a shaft 40 at right angles to shaft 14 having a beveled gear 41 adapted to mesh with gear 15. Shaft 40 extends beyond the bracket and has a bushing 42 on which is pivotally mounted a casting 43 in which is set two tubular sleeves 44. Said casting also has bosses 45 to which are secured guide plates 46, three in number, and spaced apart to give entrance to the guide roll 47. Mounted upon said sleeves 44 at a suitable distance therefrom is a second casting 48 provided with bosses 49 to which are secured the other ends of the guide plates, the plates being held in place by nuts 50. On shaft 40 is mounted a chain sprocket 51 and in a slot 52 in casting 48 is mounted the axle of a chain sprocket 54, the axle 55 of which is adjustable in said slot by means of an adjusting screw 56. Sprockets 51 and 54 carry a sprocket chain 57, one link 58 of which is provided with a pin 59 upon which is a guide roll 47 adapted to travel in contact with guide plates 46. In sleeves 44 are slidable rods 61 to the ends of which is secured a cross head 62. A driving rod 63 has an end pivotally connected with a spindle 64 on link 58 and the other end mounted on a spindle 65 turning on the head 62. Attached to said head in any suitable manner is a saw 66. On the main frame is a hanger 67 to which is pivotally attached an eye bolt 68 on which is a forwardly extending arm 69 carrying a dog 70 adapted to take into a log 71 to be sawed. The end of the saw has a handle 76 by means of which the sawyer holds it upon the work and for his convenience a hand hold 77 is slidably mounted upon the handle, the hand hold remaining stationary while the saw handle reciprocates therein. A brace 72 pivoted to bracket 73 and to a block 78 on the log holder 69 assists in steadying the log holder as does also a brace 79 pivoted at one end to the frame and at the other end to an adjustable block 80 on the log holder. The saw frame is held against lateral vibration by a brace 81 having one end pivoted to the saw frame and the other end pivoted to a bearing 82 on saw frame supporting bracket. The machine is provided with a tongue 83 which in turn is provided with a combined tongue supporting machine anchor 84 slidably mounted in a holder 85 on the tongue.

The operation of my improved sawing mechanism is as follows: When the machine is properly placed relative to the log or tree the saw frame is turned on its support until the saw is at a proper angle to operate on the log. It is then fastened in that position and the motor started. The sawyer pulling on the rope sets the clutch and motion is thereby transmitted from the motor shaft through intermediate mechanism to the saw reciprocating mechanism. When the cut is completed and the rope released the spring throws the clutch out and the saw stops. When the machine is properly placed, if the main frame is not at proper elevation, it may be raised or lowered, as the case may be, by turning the shaft which carries the worm which is in engagement with the gear on the drop axle. When the machine is to be transported from place to place, or when not in use, the entire saw frame may be turned upwardly and backwardly upon the rest therefor provided on the main frame.

The advantages of my improved machine are that it is portable; that the main frame is readily adjusted to different heights; and that the sawing mechanism is both pivoted and rotatable relative to the main frame, whereby the saw operates at any angle.

Having thus described my invention and its use I claim:

1. In a sawing machine, a main frame, a motor and motor shaft mounted thereon, a bracket rotatably mounted on a horizontal bearing, a saw frame pivotally attached to said bracket to move vertically, a saw and saw operating mechanism and means intermediate the motor shaft and the saw frame adapted to impart action to the saw operating mechanism.

2. In a sawing machine, a main frame, a motor and its shaft mounted thereon, a beveled gear shaft mounted in a bearing on the main frame and concentric with said motor shaft, a forked bracket rotatable upon said bearing and provided with a beveled gear shaft, the beveled gears on said last two shafts being adapted to mesh, a saw operating frame pivotally mounted upon said bracket, and a stationary rest upon the main frame positioned to support the saw operating mechanism when turned on its vertical axis while the machine is being transported from place to place.

3. In a sawing machine, a main frame, a motor and its shaft mounted thereon, a beveled gear shaft mounted in bearings on said main frame and operable through intermediate mechanism by the main shaft, a bracket rotatably mounted on said bearing provided with a shaft having a beveled gear, said beveled gears being adapted to be in mesh, a

saw operating mechanism supporting frame comprising two heads, one pivotally mounted upon said bracket, two sleeves mounted in said head, the other head secured to said sleeves, guide plates secured to said sleeve supports, sprockets, a sprocket chain carried by said sprockets, a saw head carrying a saw, and a connecting rod pivotally attached to the saw head and to a link in said chain, whereby a reciprocating motion is imparted to said saw.

4. In a sawing machine, a main frame, a motor and its shaft mounted thereon, a beveled gear shaft mounted in bearings on said main frame and operable through intermediate mechanism by the main shaft, a bracket rotatably mounted on said bearing provided with a shaft having a beveled gear, said beveled gears being adapted to be in mesh, a saw operating mechanism supporting frame comprising two heads, one pivotally mounted upon said bracket, two sleeves mounted in said head, the other head secured to said sleeves, two sprockets, one adjustable toward and away from the first mentioned head, guide plates secured to said sleeve supports, a sprocket chain carried by said sprockets, a saw head carrying a saw, and a connecting rod pivotally attached to the saw head and to a link in said chain, whereby a reciprocating motion is imparted to said saw.

5. In a sawing machine, a main frame, a motor and its shaft mounted thereon, a beveled gear shaft mounted in bearings on said main frame and operable through intermediate mechanism by the main shaft, a bracket rotatably mounted on said bearing provided with a shaft having a beveled gear, said beveled gears being adapted to be in mesh, a saw operating mechanism supporting frame comprising two heads, one pivotally mounted upon said bracket, two sleeves mounted in said head, the other head secured to said sleeves, guide plates secured to said sleeve supports, sprockets, a sprocket chain carried by said sprockets having one combined link, guide roll and guide rod pivot, a saw head carrying a saw, and a connecting rod pivotally attached to the saw head and to said link, whereby reciprocating motion is imparted to said saw.

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