

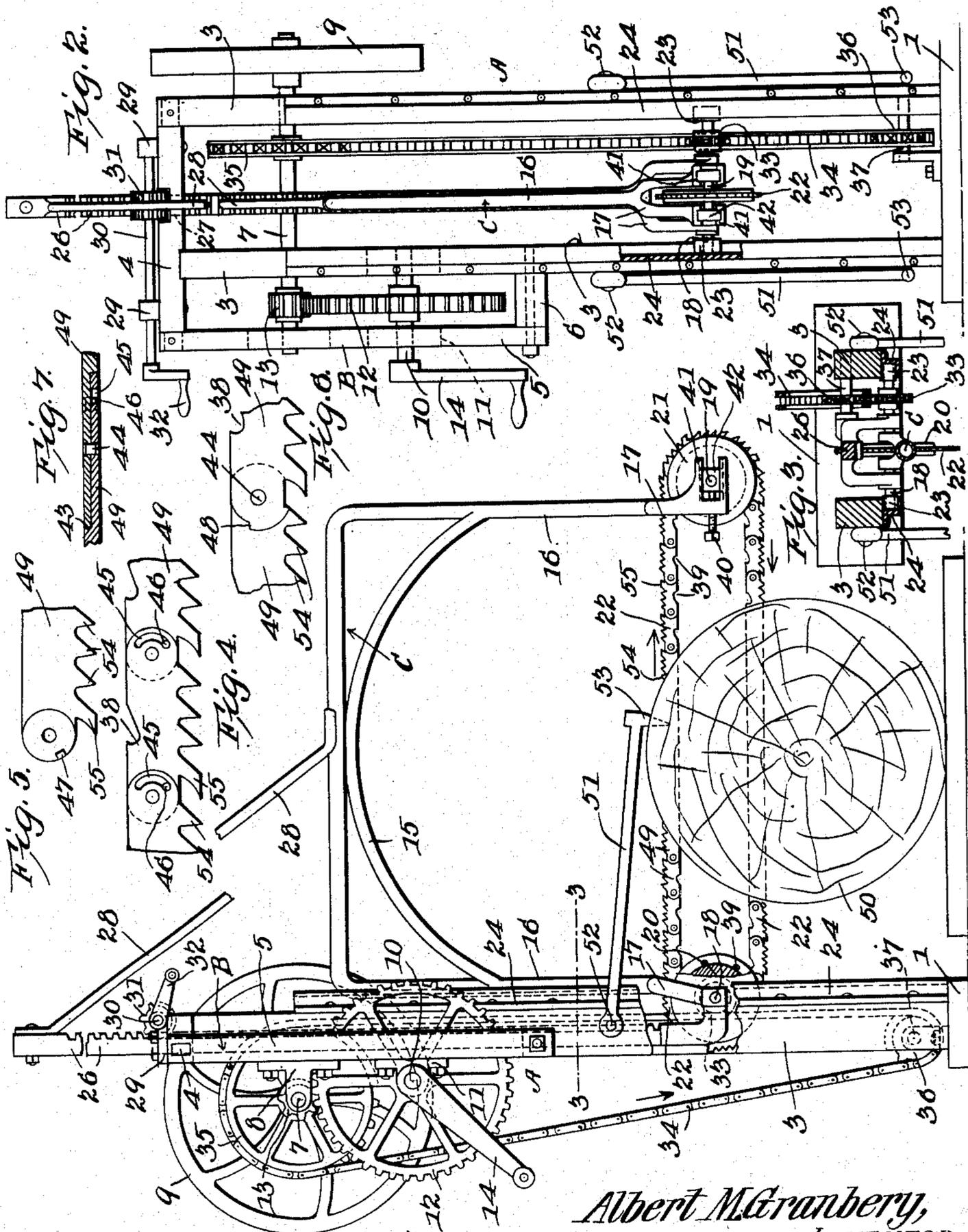
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A. M. GRANBERY.

CHAIN SAW.

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ALBERT M. GRANBERY, OF COLLIERVILLE, TENNESSEE.

CHAIN-SAW.

No. 846,663.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ALBERT M. GRANBERY, a citizen of the United States, residing at Collierville, in the county of Shelby and State of Tennessee, have invented a new and useful Chain-Saw, of which the following is a specification.

This invention relates to a sawing machine or mill of that type in which a chain saw is employed and is adapted to cut wood into different lengths for spokes, staves, kindling, and the like in a quick and easy manner.

The invention has for one of its objects to provide a device of this character that is capable of being manually or power driven and is of simple, inexpensive, and compact construction, so as to be easily operated and transported from place to place.

A further object of the invention is the employment of a simple and improved mechanism for driving the saw, while permitting at the same time the latter to be fed.

Another object of the invention is to provide guiding and driving means for the chain saw, including devices whereby the tension of the saw may be adjusted.

With these objects in view and others, as will appear as the nature of the invention is better understood, the invention comprises the various novel features of construction and arrangement of parts, which are hereinafter more fully described, and set forth with particularity in the appended claims.

In the accompanying drawing, which illustrates one embodiment of the invention, Figure 1 is a front elevation of the machine with portions broken away. Fig. 2 is a side elevation viewed from the right in Fig. 1. Fig. 3 is a horizontal section on line 3-3 of Fig. 1. Figs. 4 to 6, inclusive, are detail views, drawn on an enlarged scale, of various forms of the saw-links. Fig. 7 is a section showing the joint between two links.

Corresponding parts in the several figures are indicated throughout by similar characters of reference.

Referring to the drawing, A represents the main supporting-frame of the machine, comprising a base-plate 1, two spaced and parallel uprights 3, and a top or cross bar 4. At one side of the frame and at the upper end thereof is a supplemental frame B, composed of an upright 5, bolted to the adjacent standard 3 at its lower end and spaced apart therefrom by a spacer 6. The upper end of the upright 5 is secured to the end of the cross-

bar 4, which is extended beyond the standard 3, to which the upright 5 is attached. Mounted adjacent the upper end of the frame A is a horizontal driving-shaft 7, mounted in laterally-extending bearings 8, arranged on the standards 3 and upright 5. At one end the driving-shaft 7 is extended beyond the frame A and has keyed thereto a fly-wheel 9. The driving-shaft may be driven in any suitable manner, as by a motor or by hand. For the latter purpose a crank-shaft 10, that is mounted in bearings 11 on the supplemental frame, is employed, the same being connected with the driving-shaft by a power-multiplying gearing comprising a gear-wheel 12 on the crank-shaft and a pinion 13 on the main driving-shaft 7. The shaft 10 is rotated by means of a hand-crank 14, secured thereto at a point outside of the supplemental frame.

Extending from the side of the main frame opposite to that having the bearings 8 and 11 is the saw-carrying frame C. This frame comprises a U-shaped structure, preferably made of bicycle-tubing and braced by the arch 15. The U-shaped frame is inverted, and at the lower end of the vertical leg 16 are bifurcations 17, providing bearings for the shafts 18 and 19. On these shafts are mounted, respectively, the driving sheave or wheel 20 and guide sheave or wheel 21 for the chain saw 22. The shaft 18 of the driving-wheel 20 is mounted at its ends in sliding blocks 23, that are guided in vertical ways 24, formed by Z-shaped angle-irons arranged along the sides of the standards 3 of the main frame. By this means the saw-carrying frame is guided vertically on the supporting-frame A. In order to move the saw-carrying frame vertically, a perpendicular rack 26 is employed, which is guided in an opening (indicated at 27, Fig. 2) in the cross-bar 4. The lower end of the rack is forked and mounted on the shaft 18, whereby the rack is adapted to move with the frame C. Between the upper end of the rack and the frame C is a diagonal brace 28, which assists in supporting the weight of the saw-carrying frame. Mounted in bearings 29 on the top bar 4 is a rotary shaft 30, having a pinion 31 meshing with the rack-bar 26 and a crank 32, whereby the shaft is rotated. By this means the saw-carrying frame can be raised or lowered, so as to adjust the saw to a log being cut up and also to feed the saw during the sawing operation.

To feed the saw and drive the same simultaneously, a sprocket is provided on the shaft 18 at one side of the bifurcation of the leg 16, as indicated at 33, Fig. 2, that meshes with a sprocket-chain 34, driven by means of a relatively large sprocket 35 on the main driving-shaft 7, the chain being guided over a small sprocket 36, arranged at the base of the main frame on the shaft 37. By reference to Fig. 1 it will be observed that the right-hand half of the chain 34 is disposed perpendicular or parallel with the guideways 24, so that as the saw-carrying frame is moved up and down the sprocket 33 will be permanently in mesh with the chain. It will thus be seen that the chain-saw will be driven by rotating the crank 14, irrespective of the height of the saw-carrying frame C. By reference to Fig. 2 it will be noted that the driving and feeding cranks 14 and 32 are located, preferably, on the same side of the main frame and at a convenient height, so that they can be operated simultaneously by the operator.

The chain saw is actuated by a positive driving means, so that slip of the saw is impossible. For this purpose each link of the saw, or links at suitable intervals, are provided with slots 38, that are adapted to be engaged by pins or other devices 39 on the driving-wheel 20, that act as teeth for imparting movement to the chain saw. The wheels 20 and 21 are peripherally grooved to a substantial depth, so as to receive the saw edgewise and maintain the latter in a vertical plane. They also insure the saw from slipping off. The tension on the saw is controlled by means of set-screws 40, each arranged in one of the bifurcations of the right-hand leg 16 of the saw-carrying frame C. Each bifurcation is provided with parallel horizontally-extending jaws 41, between which is arranged a sliding block 42, in which the shaft 19 is mounted. By means of the set-screws 40 these blocks 42 can be moved to the right or left, and thereby adjust the tension on the saw. The links of the saw, as shown in Fig. 7, are arranged with their ends overlapping, the overlapping portion being halved or shouldered, as indicated at 43, so that the thickness at the joint of the links will be no greater than the body portion. Adjacent links are connected by countersunk rivets 44. In order to prevent the lower half of the chain saw from sagging or buckling upwardly incident to the feed of the saw, several different means may be employed, which maintain the saw straight while passing through the wood, but permit it to readily pass around the wheels 20 and 21. Thus, as shown in Fig. 4, the overlapping end of one link may be provided with a segmental slot 45, in which works a pin rigidly secured to the overlapping portion of the adjacent link. When the pin is at the bottom of the segmental slot, as shown in Fig. 4, the saw is pre-

vented from buckling upwardly; but by reason of the slot the band can readily pass around the wheels. The pin 46 may be in the form of a rivet that is riveted in place, or it can be a lug 47, struck up at right angles from the link, as shown in Fig. 5. A further alternative form is shown in Fig. 6, the same comprising interlocking shoulders 48 on the overlapping portions of adjacent links, the links being designated by 49 in the several figures.

The legs 16 of the saw-carrying frame are spaced at a suitable distance apart, so as to embrace a log of substantial dimensions, and the member 15 is arched, so as to provide sufficient clearance as well as to brace or strengthen the inverted-U-shaped structure. A log, as indicated at 50, is placed under the frame C, with its length substantially parallel with the plane of the main frame A, and the machine and log are held in fixed relations by means of one or more dogs 51, pivoted to the standard 3 at 52 and provided with spurs 53, that are adapted to be driven into the surface of the log, as shown. Fig. 1 illustrates the machine in operation, the cranks 14 and 32 being turned in the directions indicated by the arrow, so as to cause, through the intervening mechanisms, the chain saw 22 to move in the direction indicated by the arrows adjacent thereto and the saw-carrying frame to move downwardly.

The chain saw may be provided with teeth of any desired character. By preference, however, I prefer to provide each link of the saw with a plurality of cross-cut teeth 54 and a drag or cleaning-tooth 55, as clearly shown in Figs. 4 to 6.

From the foregoing description, taken in connection with the accompanying drawing, the advantages of the construction and of the operation of the invention will be readily understood by those skilled in the art to which it appertains, and it will be readily seen that logs of different diameters may be quickly and easily sawed.

I have described the principle of operation of the invention, together with the apparatus which I now consider to be the best embodiment thereof; but I desire to have it understood that the apparatus shown is merely illustrative, and that various changes may be made when desired as are within the scope of the invention.

What is claimed is—

1. The combination of a main frame comprising spaced uprights, guideways on the uprights, a saw-carrying frame extending outwardly from between the uprights, a saw-actuating shaft mounted on the latter frame, means on the shaft engaging in the guideways, a rack guided on the main frame and connected with the saw-carrying frame, means on the main frame for actuating the rack, and a bracing member connecting the

saw-carrying frame and rack to support the outer end of the former.

2. The combination of a main frame comprising a pair of uprights, angle-irons on the uprights for forming guideways, a saw-carrying frame arranged at right angles to the main frame with its outer end suspended free, a shaft on the saw-carrying frame for actuating the saw, bearing-blocks for the ends of the shaft engaging in the guideways, a vertically-disposed rack having its lower end connected with the said shaft, means on the upper end of the main frame guiding the rack, and a bracing member between the upper end of the rack and the outer portion of the saw-carrying frame.

3. The combination of a main frame comprising a pair of uprights, vertical guideways thereon, a saw-carrying frame comprising an inverted-U-shaped structure extending outwardly at right angles to the plane including the uprights, a driving-shaft on the main frame disposed with its axis at right angles to the plane of the saw-carrying frame, a saw-driving shaft on the second frame disposed parallel with the said driving-shaft, a sprocket-and-chain mechanism on the main frame actuated by the driving-shaft, means for guiding the saw-carrying frame along the guideways, a sprocket on the saw-driving shaft permanently meshing with the chain of the said mechanism, and means for feeding the saw-carrying frame.

4. The combination of a main frame comprising uprights spaced apart and connected at their ends, a driving-shaft adjacent the upper end of the frame, a crank-shaft arranged at one side of the frame for actuating the driving-shaft, a shaft at the base of the frame, sprockets on the shafts at points intermediate the uprights, a sprocket-chain extending from one sprocket to the other and arranged with one half extending vertically, guides on the uprights disposed parallel with the said half of the sprocket-chain, an inverted-U-shaped structure having its lower ends bifurcated, grooved wheels arranged between the bifurcations of the said structure, a chain saw extending around the wheels, a saw-driving shaft journaled on one of the bifurcated ends of the structure and carrying one of the grooved wheels, bearing-blocks on the saw-driving shaft engaging in the guideways of the main frame, a rack connected with the said structure, a pinion meshing therewith, and a crank-shaft for actuating the pinion supported on the upper end of the main frame and having its crank

on the same side of the latter as the crank for the driving-shaft.

5. The combination of a main frame comprising a base, spaced uprights mounted thereon, and a cross-piece mounted on the uprights, with a saw-carrying frame extending outwardly from between the uprights, a saw-actuating shaft mounted on the latter frame, metal strips of angular cross-section arranged on the uprights and cooperating therewith to form guideways, blocks on the ends of the shaft movable in the guideways, a rack guided on the main frame and connected with the saw-carrying frame, means on the cross-piece for actuating the rack, and a bracing member connecting the saw-carrying frame and rack to support the outer end of the former.

6. The combination of a main frame, a horizontal driving-shaft mounted thereon, a fly-wheel on the shaft, a power-multiplying gearing for transmitting motion to the driving-shaft, a sprocket-and-chain device on the frame actuated by the driving-shaft, vertical guides on the frame, a saw-carrying frame movable on the main frame, a wheel on the saw-carrying frame for driving the saw, a shaft for the latter wheel, bearing-blocks on the ends of the shaft engaging in the guides, a sprocket connected with the wheel and arranged to be permanently in mesh with the chain of said device, and means for raising and lowering the saw-carrying frame.

7. The combination of an upright rectangular frame, a vertically-movable saw-carrying frame extending from one side of the main frame and movable on the latter, a rack attached to the lower portion of the saw-carrying frame and guided on the main frame, a bracing member connected with the rack at its upper portion and with the outer portion of the saw-carrying frame, a crank-shaft mounted at the upper end of the main frame, a pinion on the crank-shaft meshing with the rack, a driving-shaft below the crank-shaft, a sprocket-and-chain mechanism on the main frame arranged to receive motion from the driving-shaft, and means on the saw-carrying frame for receiving motion from the said mechanism and imparting it to the saw.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

ALBERT M. GRANBERY

Witnesses:

J. F. HOUSTON,
J. M. FARLEY.