

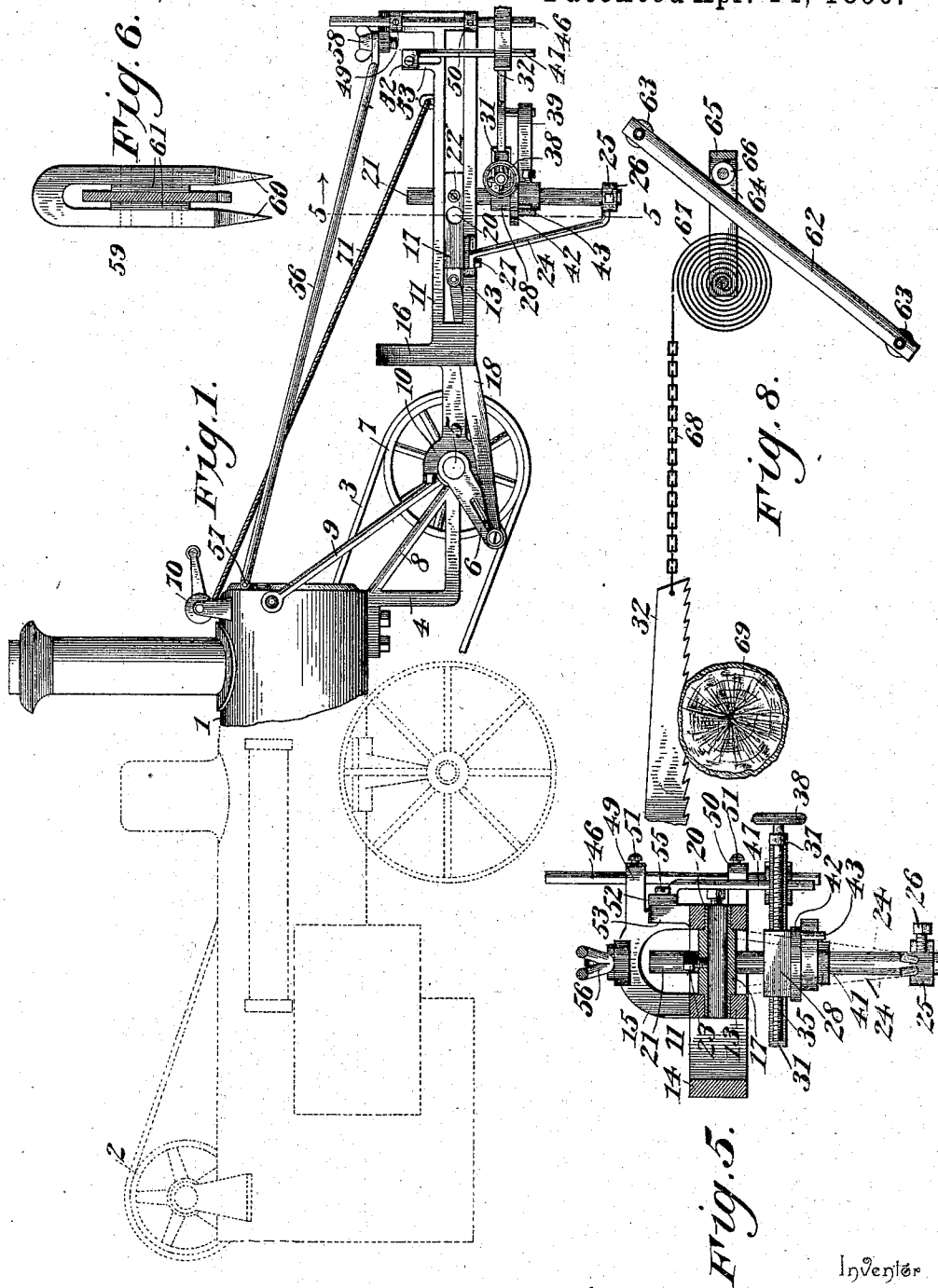
(No Model.)

2 Sheets—Sheet 1.

C. M. HILLEBRAND.  
SAWING MACHINE.

No. 558,073.

Patented Apr. 14, 1896.



Witnesses;

*M. W. Hillebrand*  
*E. H. Hillebrand*

By *his* Attorneys.

*Christian M. Hillebrand,*

*C. A. Snow & Co.*

(No Model.)

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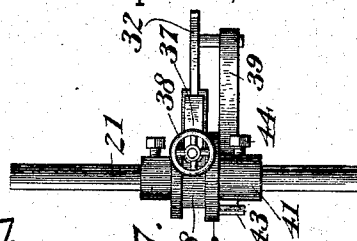
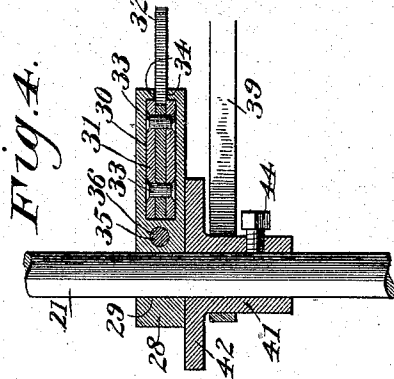


Fig. 2.

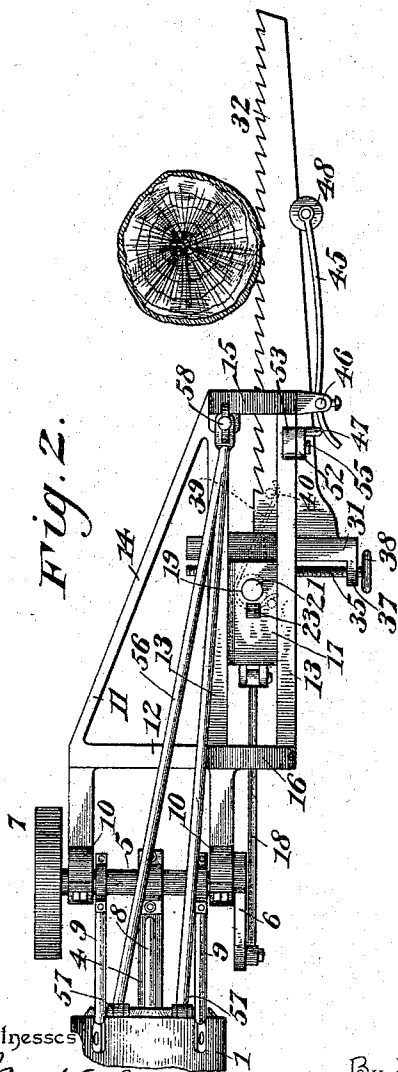
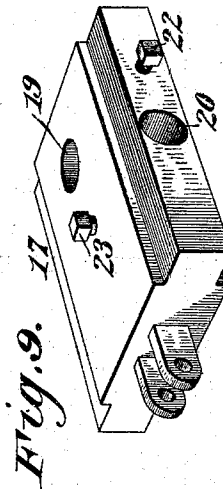
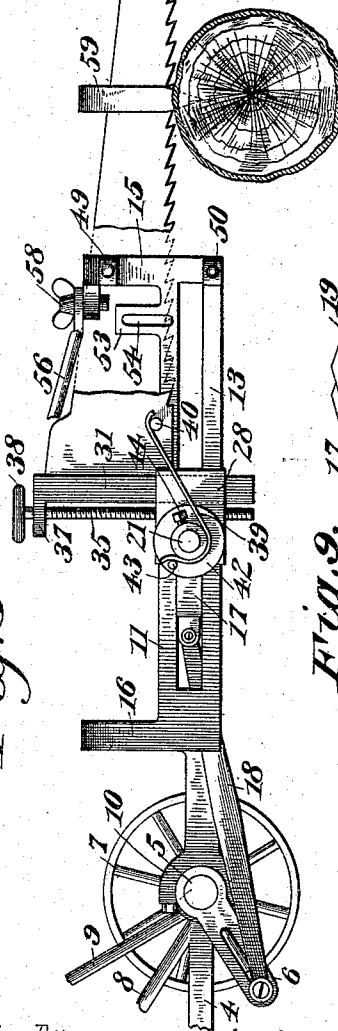


Fig. 3



Inventor,

By his Attorneys. *Christian M. Hillebrand*  
*Ca Snow & Co.*

# UNITED STATES PATENT OFFICE.

CHRISTIAN M. HILLEBRAND, OF LEMARS, IOWA.

## SAWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 558,073, dated April 14, 1896.

Application filed January 26, 1895. Serial No. 536,352. (No model.)

*To all whom it may concern:*

Be it known that I, CHRISTIAN M. HILLEBRAND, a citizen of the United States, residing at Lemars, in the county of Plymouth and State of Iowa, have invented a new and useful Sawing-Machine, of which the following is a specification.

The invention relates to sawing-machines, and particularly to a device adapted for use in clearing land, the objects in view being to provide an apparatus capable of being operated by steam-power, as by any traction-engine of ordinary construction; to provide improved means for changing the plane of operation of the saw-blade to adapt it for cutting standing or horizontal timber; to provide simple and efficient means for feeding and guiding the saw-blade in either of its positions; to provide means for cutting timber below the surface of the soil, as in clearing land in which it is desirable to utilize all of the surface, and to provide simple and improved means whereby the apparatus may be arranged in convenient position for transportation by the traction-engine from which it derives power.

Further objects and advantages of the invention will appear in the following description, and the novel features thereof will be particularly pointed out in the claims.

In the drawings, Figure 1 is a side view of a sawing-machine embodying the invention applied in the operative position to and connected with a traction-engine. Fig. 2 is a plan view of the machine. Fig. 3 is a side view of the same, showing the saw arranged to cut in a vertical plane. Fig. 4 is a detail vertical section of the head-block and the contiguous end of the saw-blade. Fig. 5 is a transverse vertical section on the line 5 5 of Fig. 1. Fig. 6 is a detail view of a saw-guide adapted to be supported by a log. Fig. 7 is a detail plan view of a portion of the inner or rear end of the saw and the contiguous parts to show the manner of securing the same in place when the saw is arranged to cut in a vertical plane. Fig. 8 is a detail plan view of an auxiliary guiding and tension device for use in connection with the saw when cutting timber of great diameter. Fig. 9 is a detail view of the carriage.

Similar numerals of reference indicate cor-

responding parts in all the figures of the drawings.

1 designates any traction-engine of the ordinary construction, having a driving-pulley 2 for a belt 3, and supported by a bracket 4 at the front ends of said engine is a transverse driving-shaft 5, provided at one end with a crank 6 and at the other end with a pulley 7, around which said belt 3 extends. A central inclined brace 8 extends from the upper portion of the bracket 4 to the center of the shaft 5, and side braces 9 serve as additional means of supporting the shaft. Fulcrum 10 is a swinging frame 11, having a transverse bar 12, parallel longitudinal slotted guides 13, and a diagonally-disposed brace 14, which connects the inner end of the transverse bar 12 with the front end of the inner guide 13. The front ends of said guides are connected by an arch 15 and the rear ends thereof by a similar arch 16. Mounted in these guides is a carriage 17, connected by means of a pitman 18 to the crank-arm 6, whereby the rotation of the shaft 5 causes a longitudinal reciprocation of the carriage. In the construction illustrated in the drawings said carriage consists of a block arranged in a horizontal plane and provided with a vertical opening 19 and a similar transverse or horizontal opening 20, either of which is adapted for the reception of a bar 21, which in Figs. 1, 2, and 5 is shown in the vertical opening and in Fig. 3 is shown in the horizontal opening. Set-screws 22 and 23 are employed to secure said bar in the openings, respectively.

In Fig. 1 a brace 24 is shown in connection with the bar 21 to prevent vibration of the lower end of said bar when the machine is adjusted to cut timber below the surface of the soil, said brace comprising duplicate rods (indicated in dotted lines in Fig. 5) attached at their lower ends to a collar 25 and at their upper ends to the under surface of the carriage. Said collar 25 is provided with a set-screw 26, and the upper ends of the rods are secured to the carriage by means of bolts 27.

Mounted for swinging movement upon the bar 21 is a head-block 28, provided with an opening 29 for the reception of said bar and with a transverse guide 30, in which is ar-

ranged a slide 31, carrying a saw 32. This slide 31 comprises upper and lower parallel plates, between which the rear end of the saw-blade is arranged, said plates and the blade being connected by means of rivets 33. The outer edges of the slide are engaged by the lips 34, which form the outer side of the guide. In connection with said slide is employed an adjusting-screw 35, threaded in an opening 36 parallel with the guide 30 and mounted loosely in a bearing formed in an ear 37 at one end of the slide. This adjusting-screw terminates at one end in a hand-wheel 38, whereby it may be adjusted to vary the position of the saw in the plane in which it is cutting.

In order to cause the saw to feed continuously and at the same time bear with a resilient pressure against the timber, a heel-spring 39 is secured to the head-block and bears at its free end against a pin 40 on the saw-blade, said spring 39 being extended around a sleeve 41, which forms a part of a disk or table 42 and engages a pin 43, depending from said disk or table. This disk or table is adapted to support the head-block at the desired adjustment upon the bar 21, and it is secured to the bar by means of a set-screw 44, as shown clearly in Fig. 4.

In the construction shown in Figs. 1 and 2, in which the saw-blade is arranged to cut in a horizontal plane, a second feeding-spring 45 is employed, said spring being arranged at its rear end in contact with the inner side of a guide-pin 46 and the outer side of a holding-pin 47, and being provided at its front end with an antifriction-roller 48, which bears against the back of the saw. Said pins 46 and 47 are carried by the frame 11 and are therefore held stationary during the sawing operation, the pin 46 being fitted in eyes 49 and 50 and being secured at the desired vertical adjustment by means of set-screws 51 and the pin 47 being provided at its upper end with an ear 52, which is bolted to a slotted standard 53, the slot 54 in said standard providing for the adjustment of the bolt 55 to vary the vertical position of the pin.

In order to support the outer end of the frame 11, a tension-brace 56 is hinged, as at 57, to the front end of the traction-engine and is engaged at its front end by a thumb-screw 58, and when it is desired to arrange the apparatus for transportation said thumb-screw is disengaged from the front end of the frame and the latter is elevated upon the shaft 5 as a fulcrum. The arrangement of the head-block upon the bar 21 as a center allows the saw to swing in a plane parallel with the frame, and thus to assume a pendent position when the frame is elevated for transportation.

From the above description it will be understood that the connection between the head-block and the parts carried thereby and the carriage is accomplished by means of the bar 21, which, when engaged in the vertical opening 19 of the carriage, provides for the

adjustment of the saw to operate in the desired plane above or below the surface of the soil, and when it is desired to operate the saw-blade in a vertical plane the bar 21 is withdrawn from the vertical opening 19 and is inserted in the horizontal opening 20, as shown in Fig. 3. The heel-spring 39 is employed in this adjustment of the parts; but the auxiliary spring 45, which is employed when the saw is operating in a horizontal plane, is useless when cutting in a vertical plane in view of the fact that the weight of the saw-blade causes it to feed through the timber. In order to guide and prevent lateral vibration of the free end of the saw, the guide 59 (shown in Fig. 6) is employed. This guide is loop-shaped, with sharpened extremities 60, which may be driven into the log upon opposite sides of the plane of the saw-blade, as indicated in Fig. 3, and the inner sides of the arms of the guide are provided with fastening-strips 61, preferably of wood or similar material, to prevent unnecessary friction and chattering of the saw.

In Fig. 8 is shown a device adapted for use in connection with the saw in cutting heavy timber while standing, said device consisting of a diagonally-disposed guide-bar 62, secured at its extremities by means of stakes 63 or similar devices, a traveler 64, consisting of a loop 65, provided with an antifriction-roller 66, and a spiral spring 67 or its equivalent, carried by said traveler and connected by means of a cord or chain 68 with the free end of the saw-blade, a portion of which is shown at 32. The tension-spring 67 prevents the saw-blade from buckling by exerting a constant strain in the direction of movement thereof, and the inclined guide 62 has the effect of drawing the saw toward or crowding it against the timber, which is indicated at 69 in said Fig. 8. It is obvious that this attachment may be employed in connection with the apparatus in sawing ordinary timber which is cut above the plane of the surface of the ground; but it is unnecessary with timber of ordinary size in that the springs 39 and 45 have sufficient strength to insure the proper feeding of the blade; but in cutting timber of great diameter it is found desirable to employ this auxiliary device, which insures rapidity of operation.

In order to facilitate the elevation of the free end of the supporting-frame, a windlass 70 is mounted upon the front end of the motor, and is connected to the frame by means of a chain or cable 71.

Changes in the form, proportion, and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

Having described the invention, what is claimed is—

1. The combination with a portable engine, of a bracket secured to the engine and extending in advance of the front end thereof, braces for supporting the front end of said

bracket, a driving-shaft mounted in bearings near the front end of the bracket, means for communicating motion to the driving-shaft, a frame fulcrumed upon said shaft, a windlass connected to the pivotal frame near its outer or free end, a tension-brace 56 having rearwardly-divergent arms hinged at their rear extremities to the engine, a thumb-screw for securing the front end of said brace to the free end of the pivotal frame, and sawing mechanism mounted upon the frame and operatively connected with the driving-shaft, substantially as specified.

2. The combination with a driving-shaft and means for operating the same, of a frame, a carriage mounted for reciprocation in the frame, a bar, means for securing the bar to the carriage in a vertical or a horizontal position, and adjusting the same longitudinally thereof a head-block swiveled upon said bar, means for holding the head-block at the desired point of the bar, and a saw carried by the head-block, substantially as specified.

3. The combination with a driving-shaft and means for operating the same, of a frame, a carriage mounted for reciprocation on the frame and operatively connected with the driving-shaft, a cross-sectionally-rounded bar depending from the carriage and mounted for adjustment thereon whereby its lower extremity may be arranged below the level of the surface of the soil, a saw having a head-block swiveled upon the bar, and means for imparting a continuous feeding impulse to the saw in the plane of its width, substantially as specified.

4. The combination with a driving-shaft and means for operating the same, of a frame, a carriage mounted for reciprocation on the frame and operatively connected with the driving-shaft, a bar secured to the carriage, a disk or table adjustably secured to the bar, a head-block swiveled upon the bar and resting upon said disk or table, a saw carried by the head-block, and means for giving the saw an impulse in the plane of its width, substantially as specified.

5. The combination with a driving-shaft and means for operating the same, of a frame, a carriage mounted for reciprocation in the frame and operatively connected with the driving-shaft a bar secured to the carriage perpendicular to the plane of movement thereof, a head swiveled on the bar and provided with a transverse guide 30, a slide 31 mounted in said guide, a saw secured to the slide, and an adjusting-screw 35 connected to the slide and threaded in an opening in the head, whereby the slide and the saw carried thereby may be adjusted in the plane of the width of the saw, substantially as specified.

6. The combination with a driving-shaft and means for operating the same, of a frame,

a carriage mounted for reciprocation in the frame and operatively connected with the driving-shaft, a swiveled head-block supported by the carriage and having a saw-blade mounted thereon, a heel-spring supported by the carriage and bearing at its free end against a pin carried by the saw-blade, and an auxiliary spring supported by the frame and provided at its free end with an antifriction-roller to bear against the back of the saw-blade, substantially as specified.

7. The combination with a driving-shaft and means for operating the same, of a frame, a carriage mounted for reciprocation in the frame and operatively connected with the driving-shaft, a bar secured and arranged perpendicular to the carriage, a head-block swiveled upon said bar and carrying a saw-blade, a disk or table having a collar adjustably mounted upon the bar and adapted to support the head-block at the desired adjustment, a heel-spring secured to said collar and connected at its free end to the saw-blade, and a vertically-adjustable auxiliary spring supported by the frame and arranged in frictional contact with the back of the saw-blade, substantially as specified.

8. The combination with a driving-shaft and means for operating the same, of a frame, a carriage mounted for reciprocation in the frame and operatively connected with the driving-shaft, a bar supported by and arranged perpendicular to the plane of the carriage, a head-block swiveled upon said bar, means for adjusting the head-block upon the bar, a heel-spring connected at its free end to the saw-blade, rods arranged parallel with said bar in advance thereof, means for adjusting said rods vertically, and an auxiliary spring secured at one end to the rods and provided at its free end with an antifriction-roller to bear against the back of the saw-blade, substantially as specified.

9. The combination with a driving-shaft and means for operating the same, of a frame, a carriage mounted for reciprocation in the frame and operatively connected with the driving-shaft, a swiveled head-block supported by the carriage, a saw-blade carried by the head-block, a diagonally-disposed guide-bar arranged in the plane of the saw-blade, a traveler mounted upon the guide-bar, and a yielding tensile connection between the traveler and the extremity of the saw-blade, substantially as specified.

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

C. M. HILLEBRAND.

Witnesses:

J. H. SIGGERS,

G. C. SHOEMAKER.