

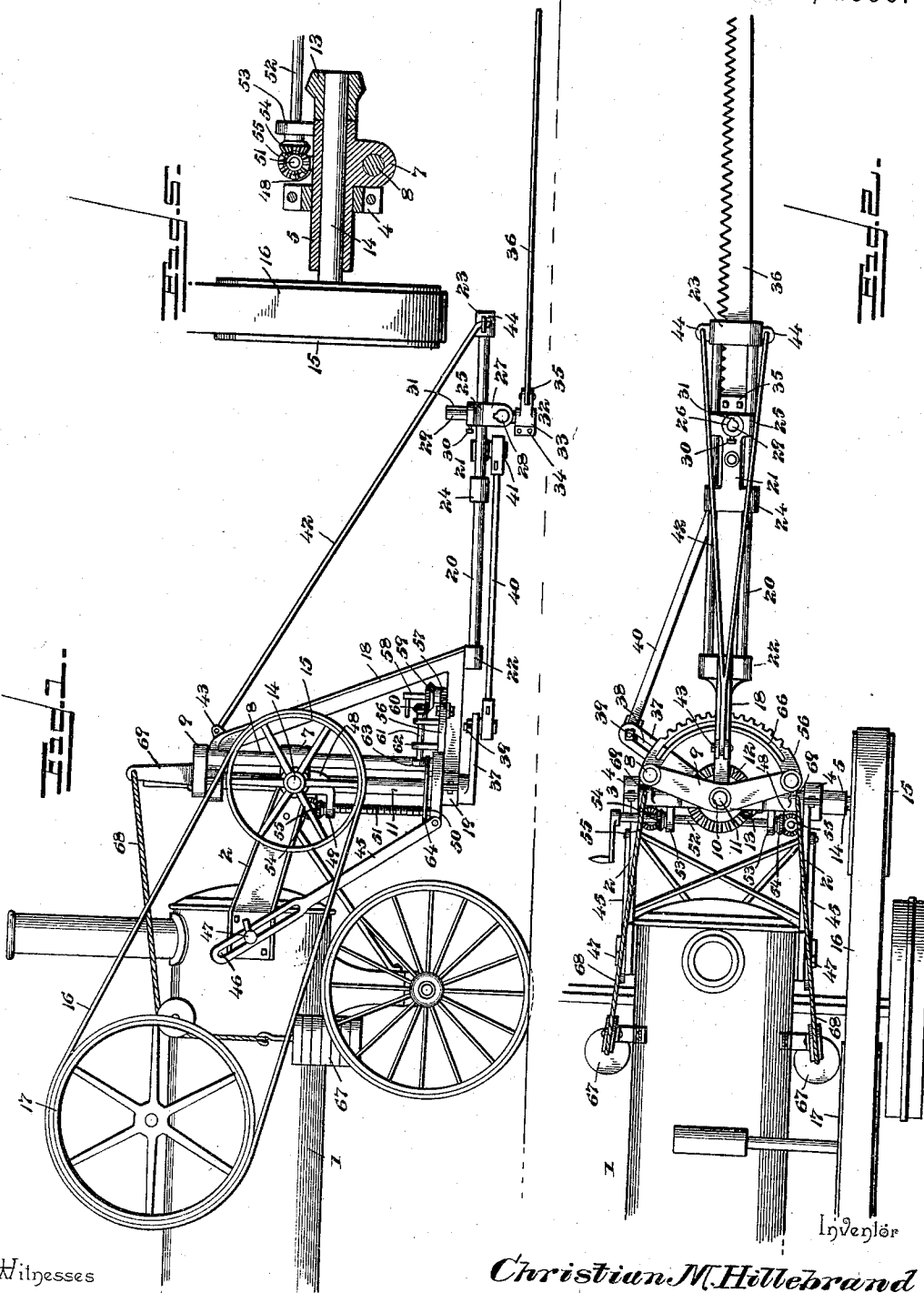
(No Model.)

2 Sheets—Sheet 1.

C. M. HILLEBRAND.
SAWING MACHINE.

No. 561,587.

Patented June 9, 1896.



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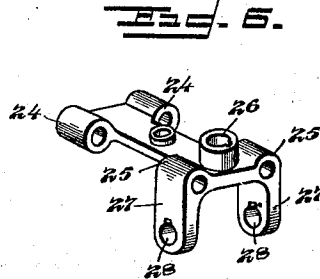
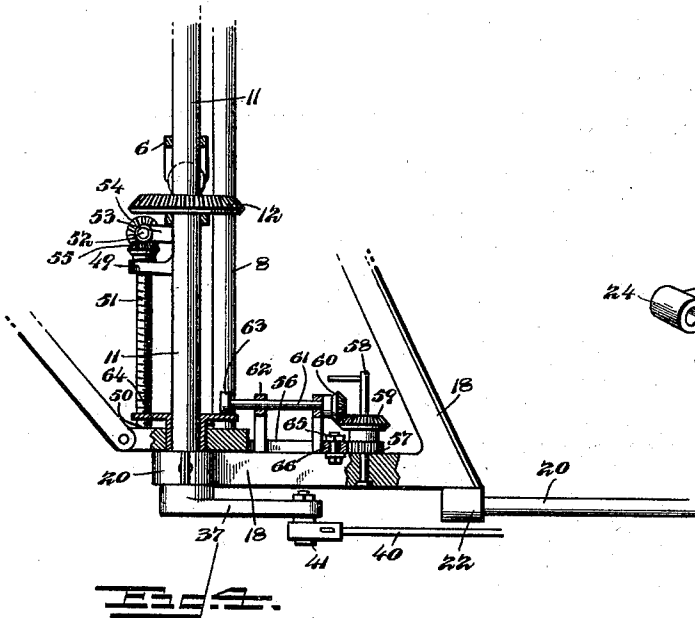
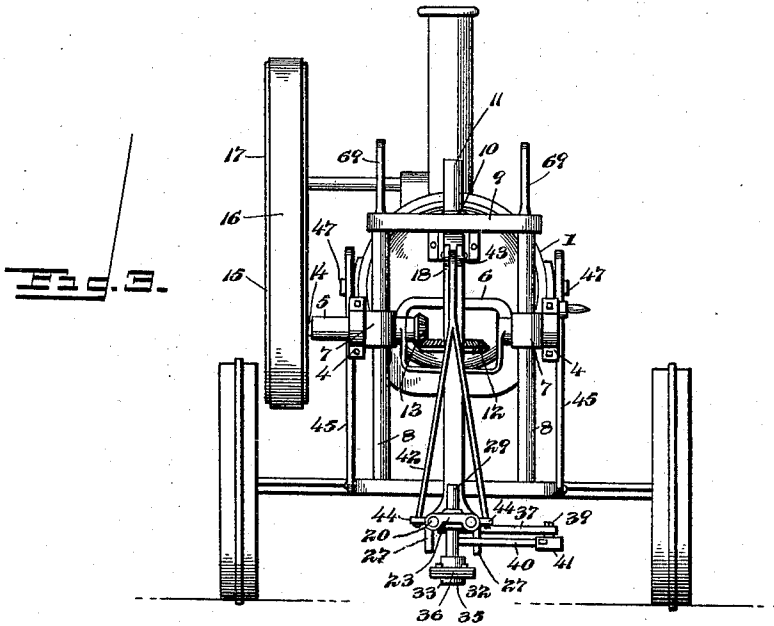
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Inventor

Christian M. Hillebrand

Witnesses

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UNITED STATES PATENT OFFICE.

CHRISTIAN M. HILLEBRAND, OF LEMARS, IOWA.

SAWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 561,587, dated June 9, 1896.

Application filed June 13, 1895. Serial No. 552,710. (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.

My invention relates to sawing-machines particularly adapted for use in clearing land; and the objects in view are to provide an apparatus designed to be operated by steam-power, as by a traction-engine of the well-known construction employed for agricultural purposes, means being provided for adjusting the sawing mechanism vertically, laterally, and angularly to adapt it for cutting standing timber or sawing logs into portable lengths, and, furthermore, to provide simple and efficient means for feeding the saw automatically in the direction of the cut.

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

In the drawings, Figure 1 is a side view of a device embodying my invention. Fig. 2 is a plan view. Fig. 3 is a front view. Fig. 4 is a vertical central section. Fig. 5 is a detail transverse section to show the means for mounting the driving-shaft. Fig. 6 is a detail view in perspective of the carriage.

Similar numerals of reference indicate corresponding parts in all the figures of the drawings.

1 designates a traction-engine of ordinary construction, from the front end of which project parallel supporting-arms 2, provided at their front ends with bearings 3, having removable caps 4, and in these bearings are arranged trunnions 5, connected at their inner ends by a yoke 6, one of said trunnions being hollow, as shown in Fig. 5. Projecting forwardly from said trunnions are the vertical guides 7, in which are mounted parallel guide-rods, forming the side members of a frame 8, capable of linear adjustment in the direction of said side rods. The side rods of the frame 8 are connected at their upper and lower ends by means of spiders 9, having forwardly-divergent arms, at the intersection of which are formed bearings 10, in alinement with simi-

lar bearings in the upper and lower sides of the yoke 6, and mounted for rotation in these registering bearings is a counter-shaft 11, parallel with the side rods of the frame 8 of the vertically-adjustable frame. Feathered upon the shaft 11, between the sides of the yoke 6, is a beveled gear 12, with which meshes a pinion 13 on the inner end of a driving-shaft 14, mounted in said hollow trunnion, said driving-shaft carrying the belt-pulley 15, which receives motion from a belt 16, traversing a belt-wheel 17, which is driven by the engine and forms a part thereof. In addition to the vertical adjustment, of which the parallel-sided frame is capable, it is adapted, by means of the trunnions of the pivotal guides 7, to swing in a vertical plane, the driving-shaft being coincident with the axis of movement of the guides, and hence of the main frame.

Mounted upon the vertical shaft or spindle 11 and adapted to swing in a plane perpendicular to the frame 8 is a frame 18 of approximately triangular shape, provided with upper and lower aligned bearings 19, which receive said spindle 11 respectively below the planes of the spiders 9, and this frame 18 carries parallel guides 20, upon which is mounted the reciprocatory cross-head or carriage 21. The guide-rods 20 are fitted and secured in eyes 22 at the front end of the frame 18 and are connected at their front ends by means of a cross-bar 23, having eyes for the reception of the extremities of the rods, and the cross-head or carriage is provided with bearing-eyes 24 and 25, which are fitted to slide upon the guides 20. The cross-head or carriage is provided at its center, near its front end, with a vertical opening or seat 26, and is also provided in depending ears 27, near said front end, with horizontally-aligned openings or seats 28, and 29 represents a bar adapted to be fitted in either the opening 26 or the openings 28. Said bar is capable of longitudinal adjustment in either of said openings and is secured at the desired adjustment by means of a set-screw 30, and in order to prevent the bar from turning in the openings or seats it is secured by means of a key 31.

Secured to one end of the bar 29 is a holder 32, having a clamp 33 secured in place by bolts 34, and also provided with jaws 35, be-

tween which is secured the rear end of the saw-blade 36. A crank-arm 37 is keyed upon the lower end of the vertical spindle or shaft 11 and is provided with a slot 38 for the reception of a pivot-bolt 39, by which connection is made between the crank-arm and the pitman 40, said pitman being fulcrumed at its front end to the cross-head or carriage by means of a wrist-pin 41. The outer end of the guide-frame is held from sagging by a Y-shaped brace 42, having its upper rear end bolted to ears 43 near the upper end of the triangular frame 18 and having the extremities of its arms engaged with lateral ears 44 on the cross-bar 23.

As above described, the main frame 8 is swiveled by means of the trunnions 5 to the supporting-arms 2, and in order to secure said main frame at the desired inclination or in a vertical position I employ slotted retaining-arms 45, which are pivoted to the lower spider 9 and are provided at their upper ends with slots 46, engaged by adjusting-bolts 47. These adjusting-bolts may be engaged with any stationary part of the apparatus, and, as shown in the drawings, they are engaged with the rear ends of the supporting-arms 2.

Depending from the trunnions mounted in the front ends of the supporting-arms 2 are brackets 48, provided with bearings 49, which are in alinement with similar bearings 50 in the lower spider 9, said spider, as above described, forming a part of the main frame 8. Mounted at their upper ends in bearings formed in the brackets 48 are the adjusting-screws 51, which are threaded in the bearings 50, whereby when the said screws are turned the main frame 8 may be adjusted vertically to arrange the saw-blade in the desired horizontal plane. The means which I employ for operating the adjusting-screws simultaneously embody a crank-shaft 52, mounted in bearings 53 and provided with beveled pinions 54, meshing with similar pinions 55 on the upper extremities of the adjusting-screws. It is obvious that the retaining-braces 45 must be released in order to allow vertical adjustment of the main frame, and when the desired adjustment is attained said brace may be fastened to secure the parts in position.

It is obvious that when the bar 29 is arranged in the vertical opening of the cross-head or carriage the saw-blade is disposed to cut in a horizontal plane, and hence when the main frame has been adjusted to arrange said blade in the desired plane in order to cut at the desired distance from the surface of the ground (or below the surface by removing the soil contiguous to the tree) said frame should be locked by means of the retaining-braces 45 to prevent swinging movement in a vertical plane. This leaves the guide-frame 18, which carries the parallel guide-rods 20, free to swing in a horizontal plane, whereby the blade may be advanced as the cutting operation proceeds. In order to regulate the advance movement of said guide-frame in order

that the necessary forward pressure may be employed to secure an effective cut, I employ feeding mechanism including a segmental rack 56, concentric with the spindle 11 and carried by the main frame 8, a pinion 57, meshing with the teeth of said rack, and means for turning said pinion. The spindle 58 of said pinion is mounted at its lower end in the lower side of the guide-frame 18, and above the pinion it carries a beveled gear 59, which meshes with a similar pinion 60, carried by a horizontal shaft 61. Said shaft is mounted in bearings 62 on the guide-frame and terminates contiguous to the spindle 11 in a friction-wheel 63, arranged in contact with a friction-disk 64, secured to said spindle 11. The friction-disk imparts rotary motion to the wheel, and this motion is communicated to the pinion meshing with the rack, and it is obvious that when the saw-blade encounters an obstacle such as a portion of wood which is of greater density the surface of the friction-disk and wheel are adapted to slip, and thus cause the saw-blade to exert the necessary pressure without a positive advance movement.

When the bar 29 is fitted in the horizontal openings 28 of the cross-head or carriage, the saw-blade is adapted to cut in a vertical plane, as in sawing logs, in which case the swinging guide-frame 18 should be locked against movement in a horizontal plane by means of a locking-bolt 65, engaging a slot 66 in the segmental rack, and the retaining-brace 45 should be loosened to allow the main frame to swing in a vertical plane. In order to regulate the feeding of the saw in cutting in a vertical plane and prevent the cramping of the saw-blade by applying too great pressure, I employ counterbalancing-weights 67, connected by cords 68 with arms 69, rising from the upper spider of the main frame. By varying the weight of these counterpoises the saw may be caused to feed at any desired rapidity.

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

Having described my invention, what I claim is—

1. The combination of a swiveled main frame adapted to swing in a vertical plane, means for securing said frame at the desired adjustment, a driving-shaft concentric with the axis of said frame, a reciprocating cross-head or carriage mounted upon guides supported by the main frame and adapted to carry a saw-blade, and connections between the cross-head or carriage and the driving-shaft, substantially as specified.

2. The combination with supporting-arms having bearings, of parallel guides having coaxial trunnions mounted in said bearings, a main frame having side bars mounted for vertical adjustment in said guides, means for

securing said frame at the desired vertical adjustment, a driving-shaft mounted concentric with one of the trunnions, a reciprocating cross-head or carriage mounted upon the guides supported by the main frame, means for connecting a saw-blade to the cross-head or carriage, and connections between the cross-head or carriage and the driving-shaft, substantially as specified.

3. The combination with a swiveled main frame adapted to swing in a vertical plane, and means for securing the same at the desired adjustment, of a driving-shaft mounted concentric with the axis of the main frame, a guide-frame swiveled upon the main frame, a cross-head or carriage mounted upon the guide-frame and adapted to carry a saw-blade, and connections between the driving-shaft and the cross-head or carriage, substantially as specified.

4. The combination with supporting-arms having alined bearings, of guides having trunnions mounted in said bearings, one of the trunnions being hollow, a main frame having parallel side bars mounted in said guides for vertical movement, means for securing said frame at the desired vertical adjustment, a guide-frame swiveled upon the main frame and capable of swinging in a horizontal plane, a cross-head or carriage mounted upon the guide-frame and adapted to carry a saw-blade, a driving-shaft mounted in said hollow trunnion of one of the guides, and connections between the driving-shaft and the cross-head or carriage, substantially as specified.

5. The combination with supporting-arms, of guides having trunnions mounted in alined bearings, a main frame having parallel side bars mounted in said guides, adjusting-screws mounted upon brackets supported by the trunnions and threaded in openings in the main frame, a guide-frame swiveled upon the main frame, a cross-head mounted upon the guide-frame and adapted to support a saw-blade, a driving-shaft mounted concentric with the trunnions of the guides, and connections between the driving-shaft and the cross-head or carriage, substantially as specified.

6. The combination of parallel pivotal guides having a common axis, a main frame having parallel side bars mounted to slide in said guides, adjusting devices mounted upon the trunnions and engaging the main frame to arrange the same at the desired vertical adjustment, retaining-braces pivotally connected to the main frame, means for securing said braces to lock the main frame against swinging movement upon the axis of the guides, a guide-frame carried by the main frame, a cross-head or carriage mounted upon the guide-frame and adapted to carry a saw-blade, a driving-shaft mounted concentric with the axis of the guides, and connections between the driving-shaft and the cross-head or carriage, substantially as specified.

7. The combination with a swiveled main frame adapted to swing in a vertical plane, and means for securing the frame at the desired adjustment, of a driving-shaft mounted concentric with the axis of the main frame, a guide-frame swiveled upon the main frame to swing in a horizontal plane, a spindle mounted upon the main frame, feeding devices for the guide-frame operatively connected with the spindle, a cross-head or carriage for a saw-blade mounted upon the guide-frame and operatively connected with the spindle, and connections between the driving-shaft and the spindle, substantially as specified.

8. The combination with a swiveled main frame adapted to swing in a vertical plane, and means for securing said frame at the desired adjustment, of a driving-shaft mounted concentric with the axis of the main frame, a guide-frame supported by the main frame, a cross-head or carriage mounted upon the guide-frame and adapted to carry a saw-blade, connections between the driving-shaft and the cross-head or carriage, and counterbalancing-weights flexibly connected to the main frame above the plane of its axis, substantially as specified.

9. The combination with a swiveled main frame adapted to swing in a vertical plane, means for securing said frame at the desired adjustment, of a driving-shaft mounted concentric with the axis of the main frame, a guide-frame swiveled upon the main frame, a segmental rack carried by the main frame, a pinion carried by the guide-frame and meshing with the teeth of said rack, a cross-head or carriage mounted upon the guide-frame and adapted to carry a saw-blade, a spindle operatively connected with the driving-shaft and said cross-head or carriage, and connections between the spindle and said pinion, substantially as specified.

10. The combination with a swiveled main frame adapted to swing in a vertical plane, and means for securing said frame at the desired adjustment, of a driving-shaft mounted concentric with the axis of the main frame, a guide-frame swiveled upon the main frame to swing in a horizontal plane, friction feeding mechanism for the guide-frame, a cross-head or carriage mounted upon the guide-frame and adapted to carry a saw-blade, and connections between the cross-head or carriage and the feeding mechanism and the driving-shaft, substantially as specified.

11. The combination with a swiveled main frame adapted to swing in a vertical plane, and means for locking the frame at the desired adjustment, of a driving-shaft mounted concentric with the axis of the main frame, a guide-frame swiveled upon the main frame and adapted to swing in a horizontal plane, a cross-head or carriage mounted upon the guide-frame and provided with openings disposed, respectively, in vertical and horizontal planes, a bar adapted to fit in either of

said openings, means for securing said bar
against rotary and longitudinal movement, a
holder secured to the bar and adapted to sup-
port a saw-blade, and connections between
5 the driving-shaft and the cross-head or car-
riage, 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.

CHRISTIAN M. HILLEBRAND.

Witnesses:

OTTO G. BERNER,
GEO. D. WERNLI.