J. E. ELDER.

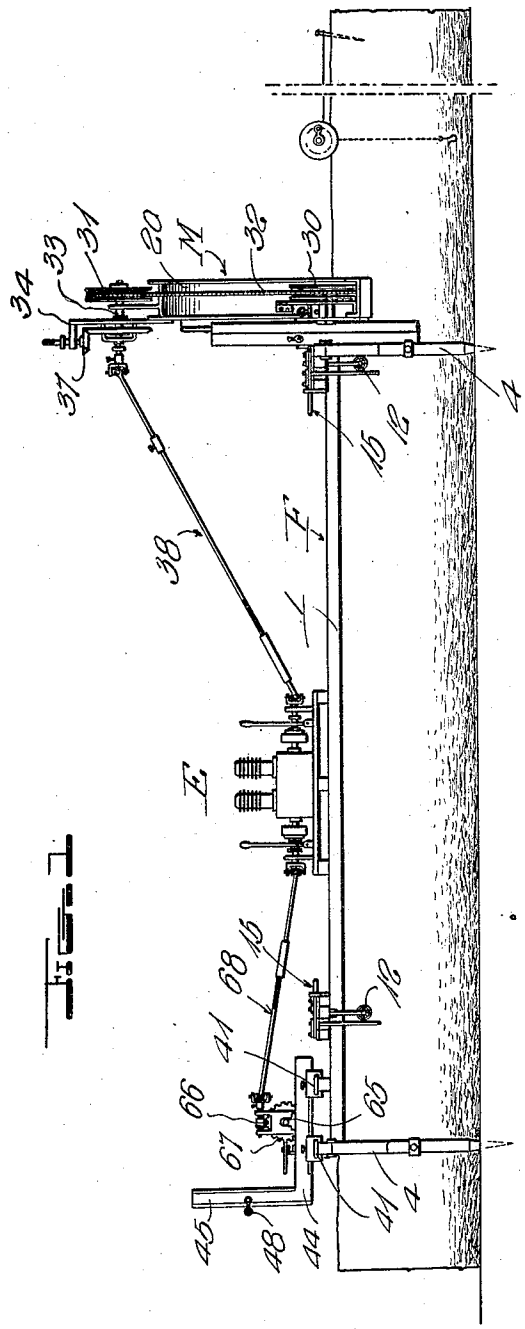
WOOD SAWING MACHINE.

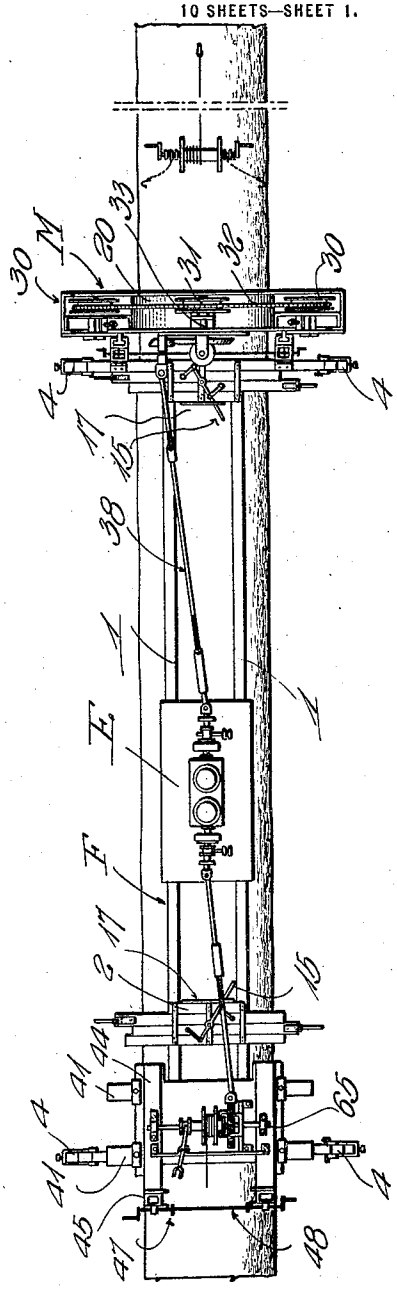
APPLICATION FILED JAN. 17, 1921.

1,420,950.

Patented June 27, 1922.

10 SHEETS—SHEET 1.





Inventor

James Edwin Elder

Witness

by A. B. Wilson & Co

Attorneys

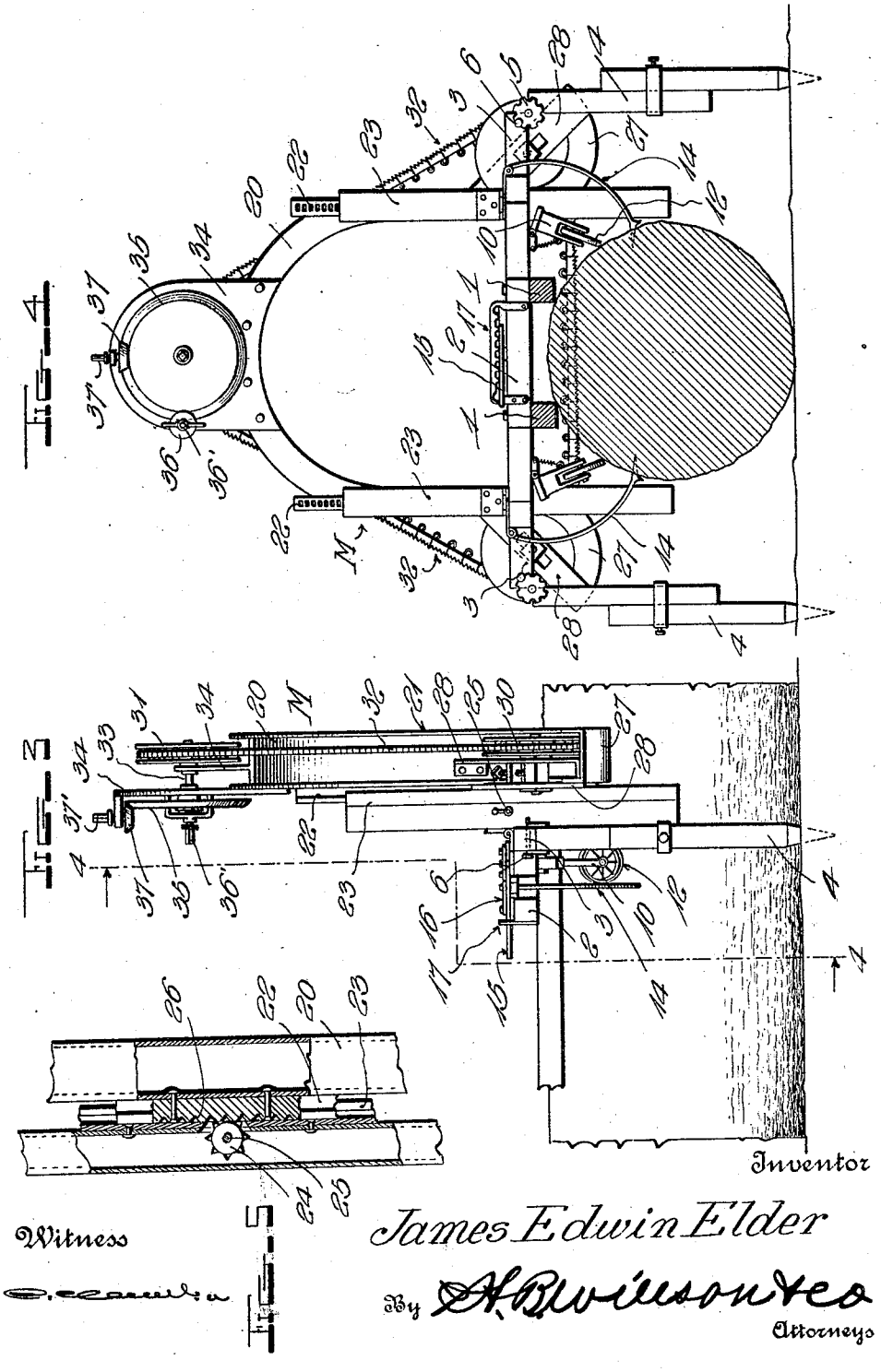
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10 SHEETS—SHEET 2.



Witness

Inventor

James Edwin Elder

By H. B. Williamson & Co

Attorneys

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10 SHEETS—SHEET 3.

FIG. 6

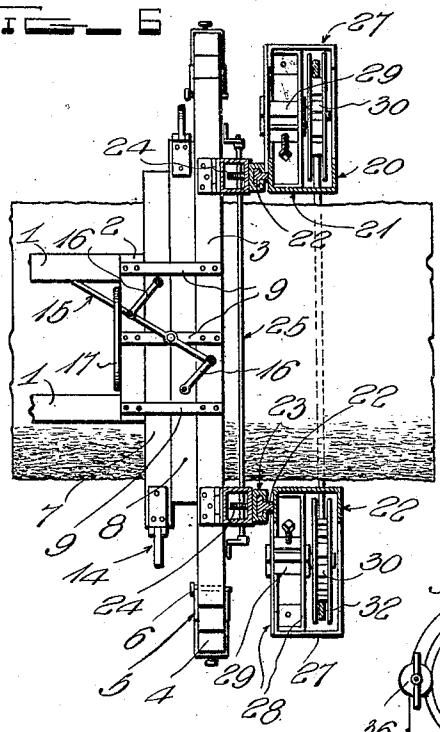


FIG. 7

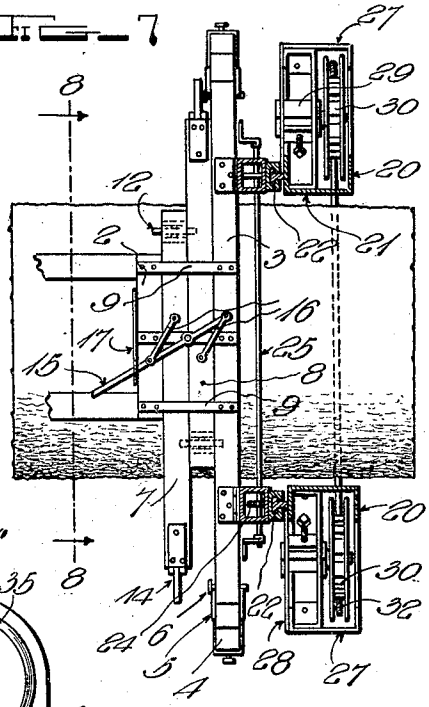
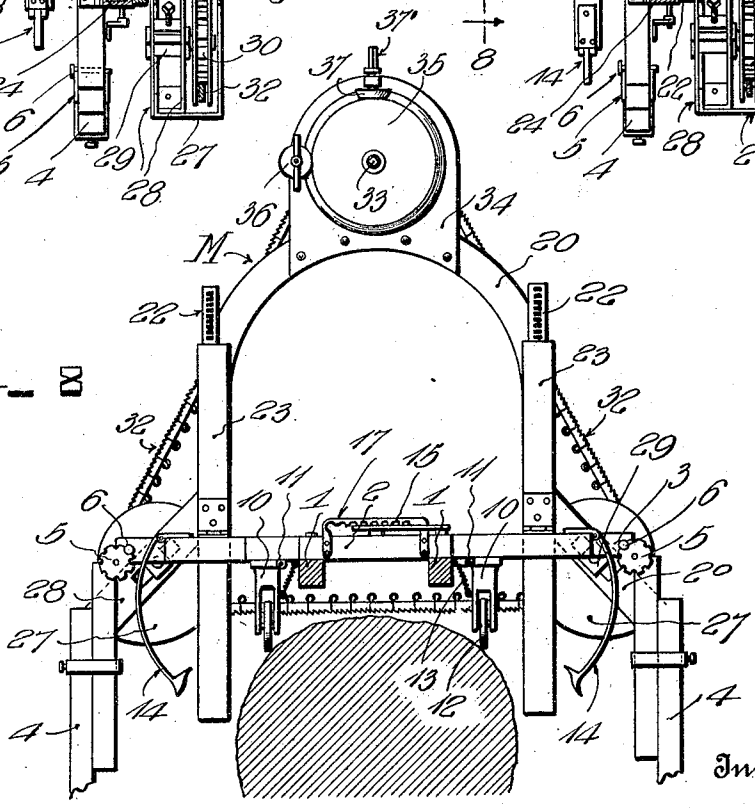


FIG. 8



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James Edwin Elder

By A. B. Wilson & Co

Attorneys

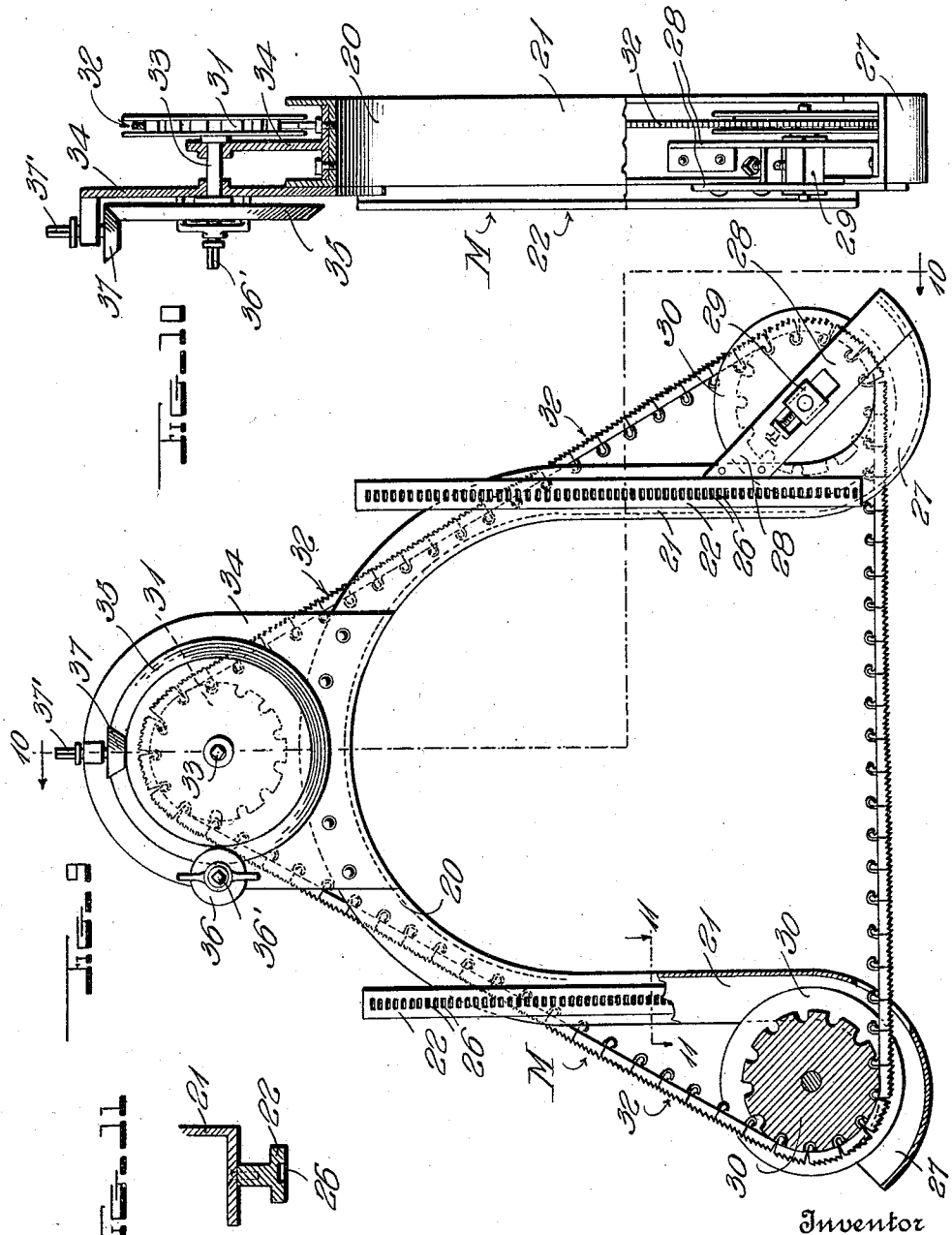
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1,420,950. **Patented June 27, 1922.**

10 SHEETS—SHEET 4.



Inventor

James Edwin Elder

Witness

By H. B. Williamson & Co

Attorneys

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10 SHEETS—SHEET 5.

Fig. 12

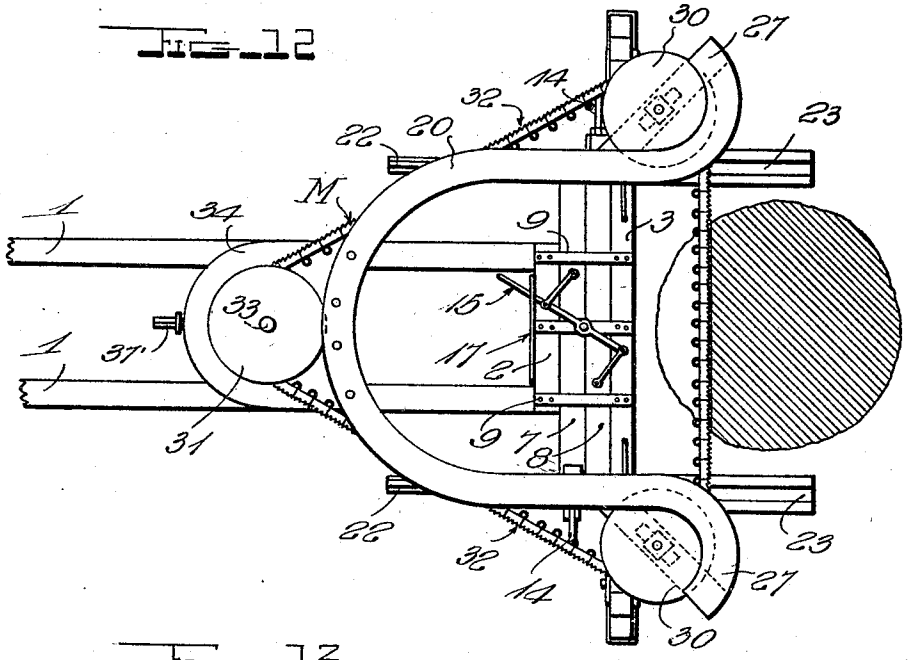
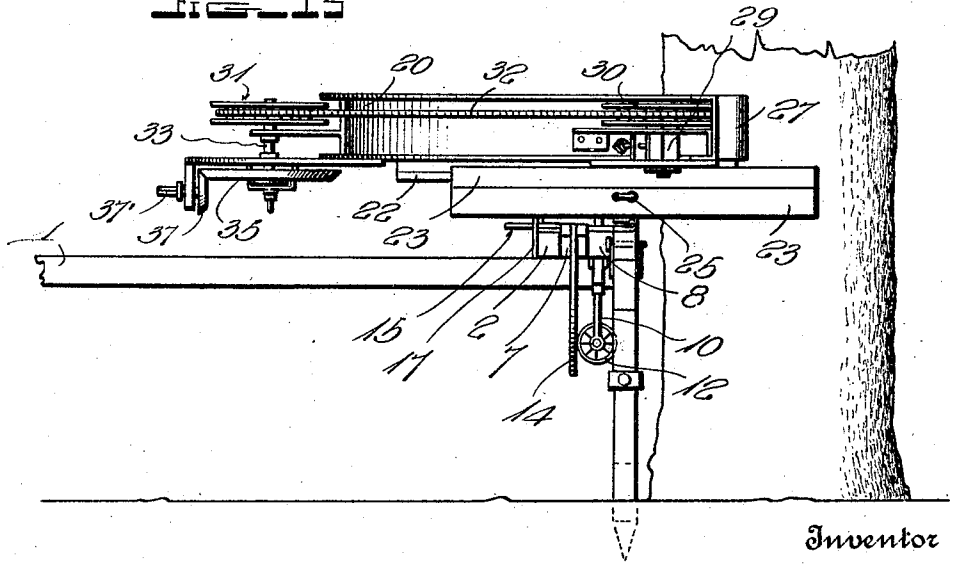


Fig. 13



Inventor

James Edwin Elder

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By A. B. Williamson

Attorneys

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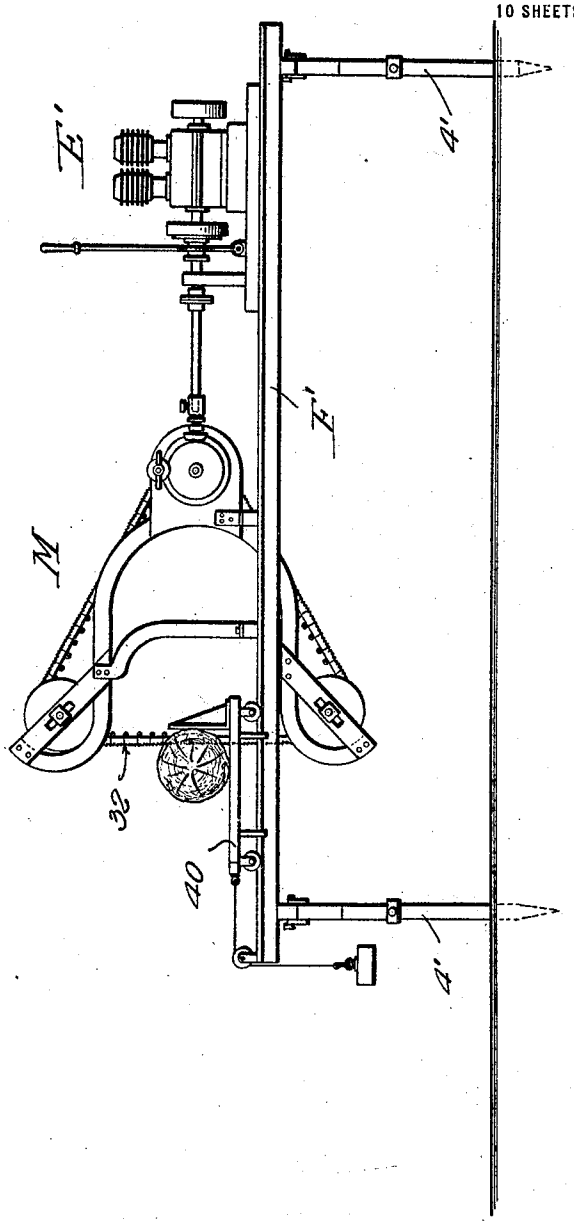


Fig. 14

Inventor

James Edwin Elder

by H. B. Wilson & Co

Attorneys

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E. [illegible]

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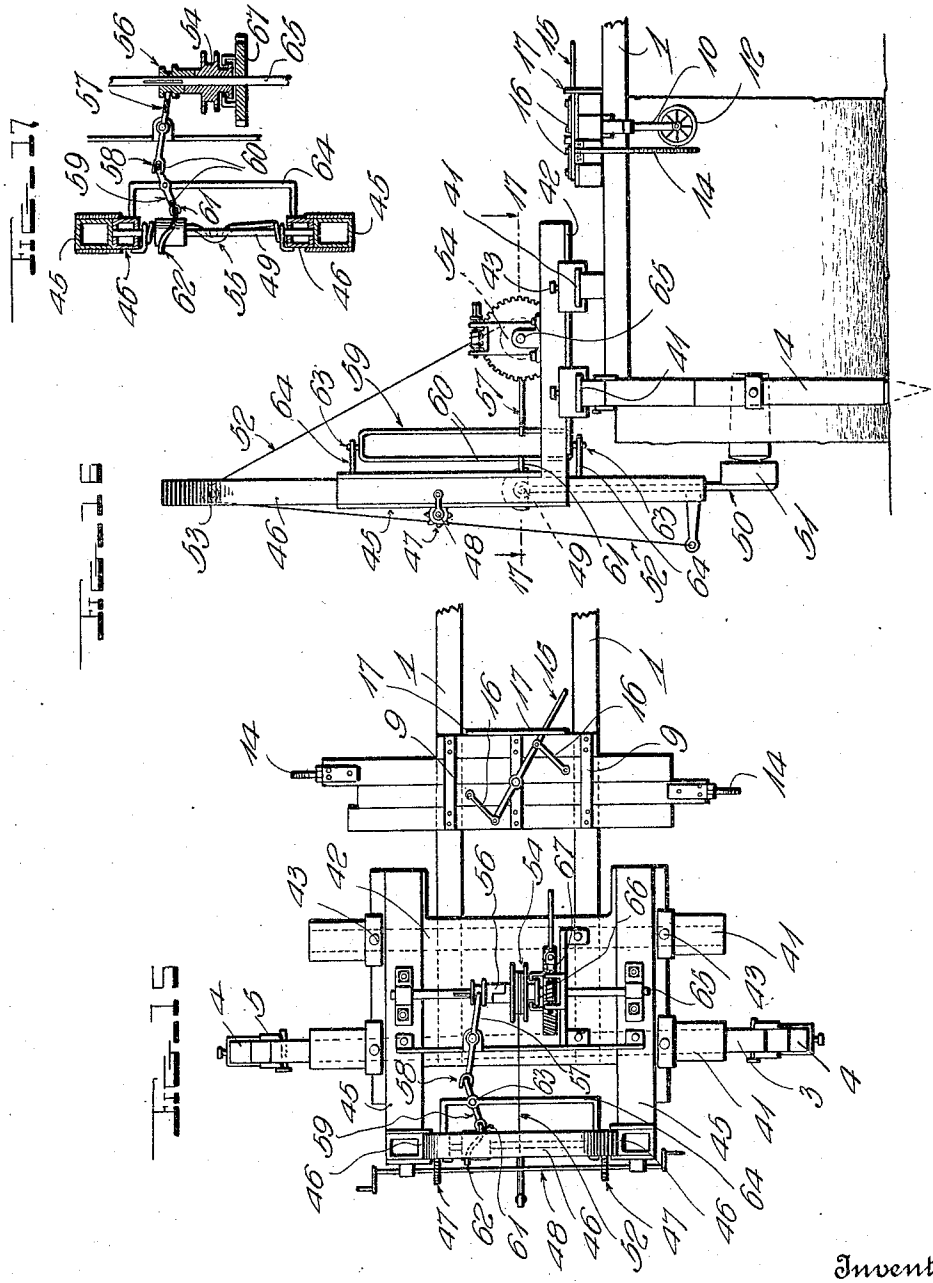


Fig. 17

Fig. 16

Fig. 15

Inventor

James Edwin Elder

Witness

By H. B. Williamson & Co

Attorneys

J. E. ELDER.

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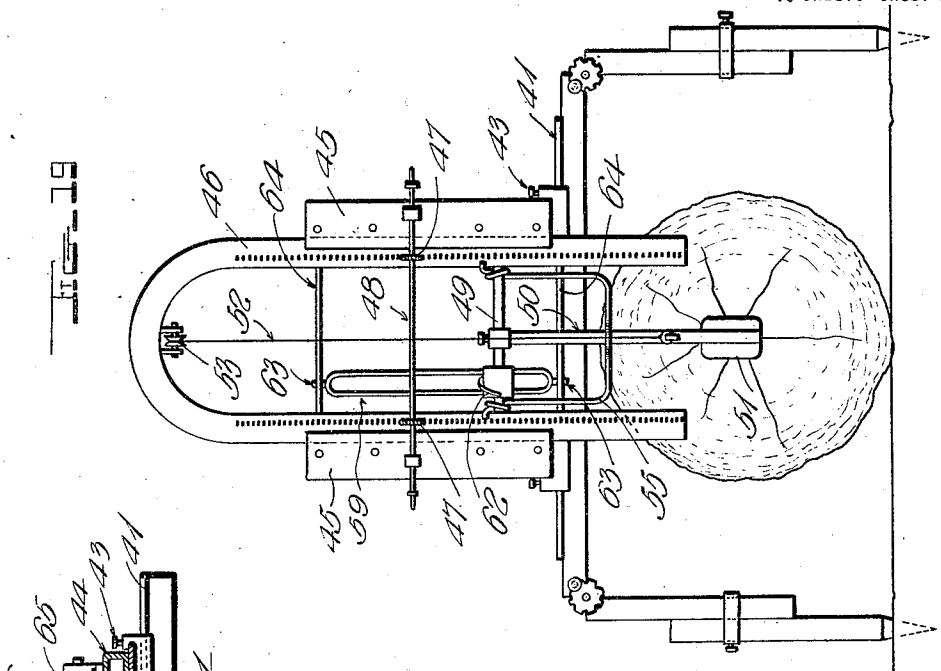
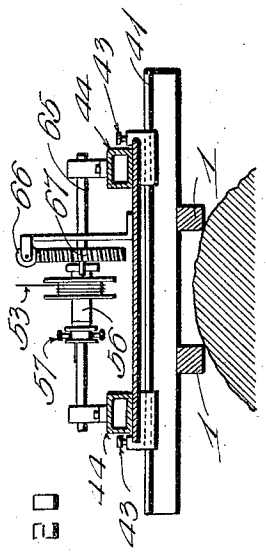


FIG. 19.



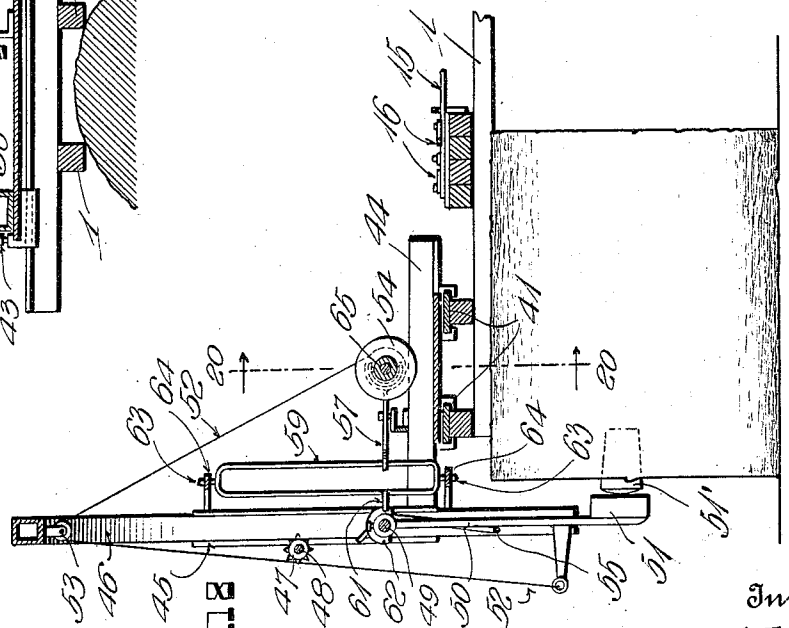


FIG. 20.

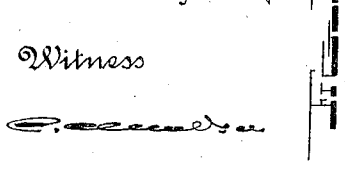


FIG. 21.

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Inventor

James Edwin Elder

By H. B. Wilson & Co

Attorneys

J. E. ELDER.

WOOD SAWING MACHINE.

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Patented June 27, 1922.

10 SHEETS—SHEET 9.

FIG. 22

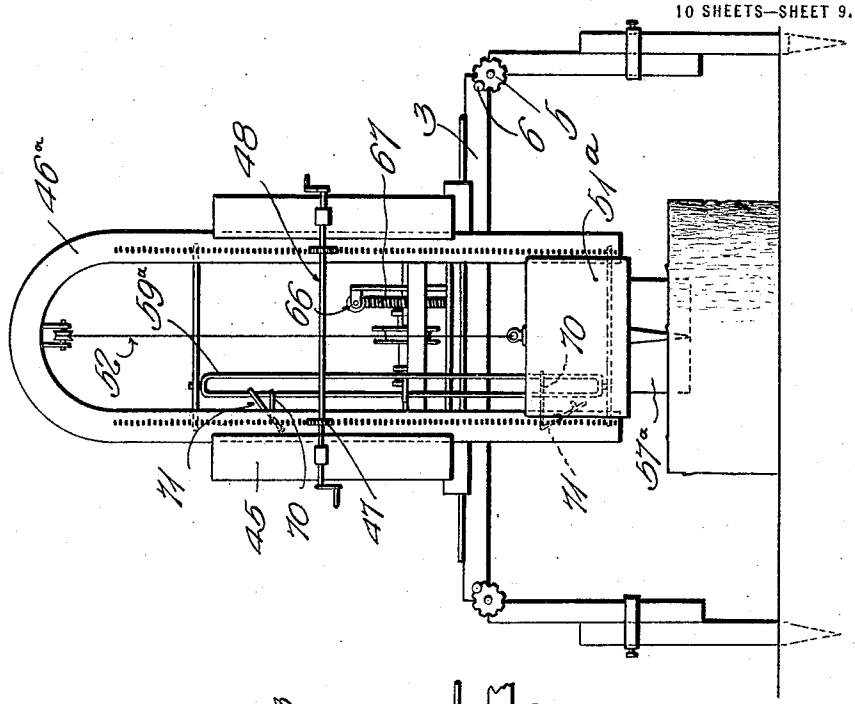
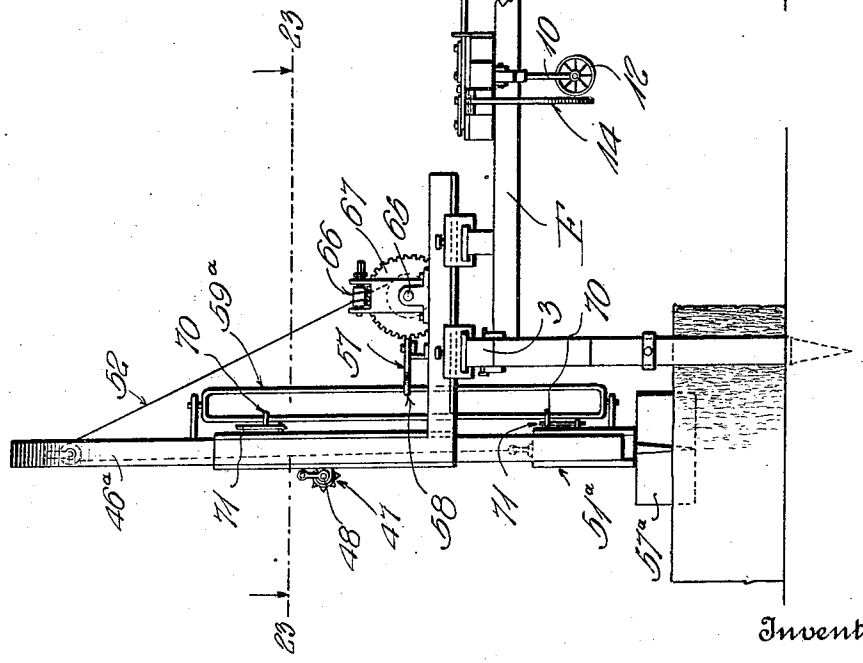


FIG. 21



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Inventor

James Edwin Elder

By A. B. Williamson

Attorneys

J. E. ELDER.

WOOD SAWING MACHINE.

APPLICATION FILED JAN. 17, 1921.

1,420,950. **Patented June 27, 1922.**

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FIG. 25

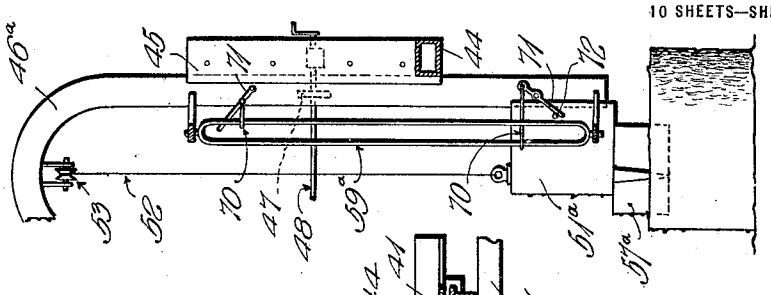


FIG. 24

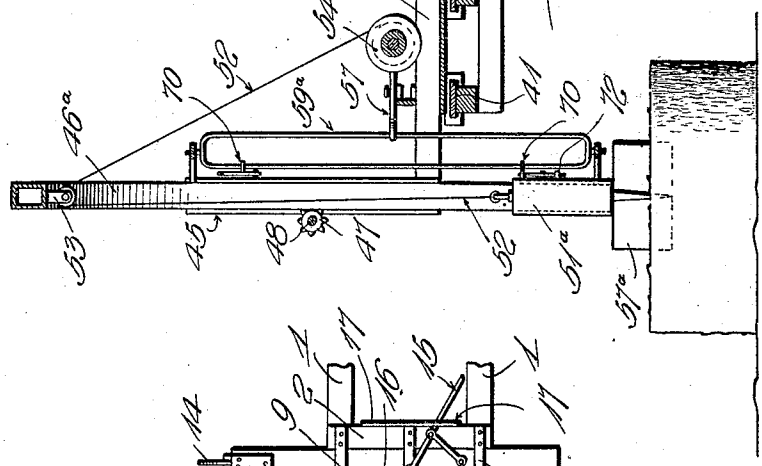
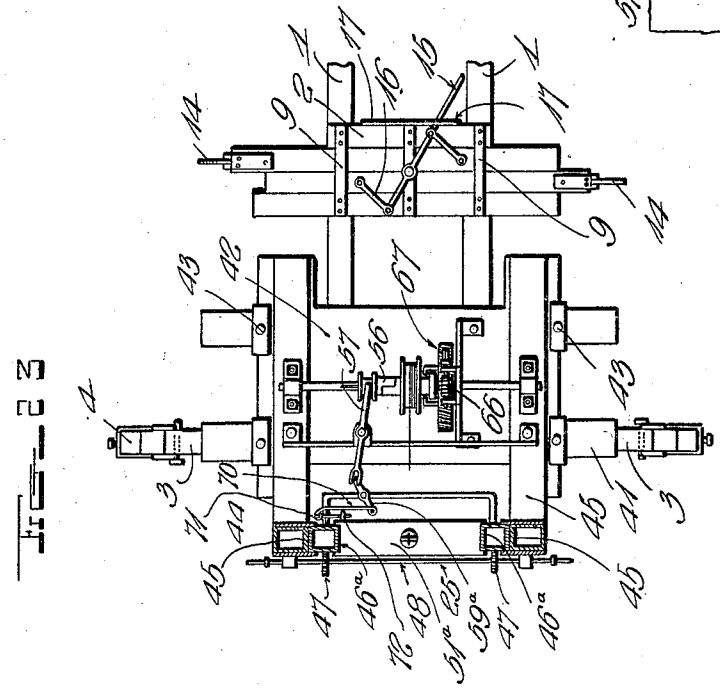


FIG. 23



Inventor

James Edwin Elder

by H. B. Williamson & Co

Attorneys

Witness

E. Granville

UNITED STATES PATENT OFFICE.

JAMES EDWIN ELDER, OF HIGHWOOD, MONTANA.

WOOD-SAWING MACHINE.

1,420,950. Specification of Letters Patent. Patented June 27, 1922.

Application filed January 17, 1921. Serial No. 437,863.

To all whom it may concern:

Be it known that I, JAMES E. ELDER, a citizen of the United States, residing at Highwood, in the county of Choteau and State of Montana, have invented certain new and useful Improvements in Wood-Sawing Machines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention has for its principal object to provide a highly efficient and reliable machine for sawing wood in practically any desired manner, and for splitting blocks of wood either while they are lying horizontally or when standing on end. In carrying out this end, I mount sawing mechanism on one end of a horizontal base frame, carry the splitting mechanism by the other end of said frame, and mount a motor on the frame between the two mechanisms, for driving either of them at will. When either sawing logs into lengths appropriate for handling in a saw-mill, or when splitting blocks of wood lying on the ground, after they have been sawed from a felled tree, it is necessary to adjust the entire machine along the work, and a further object of my invention is to provide a novel arrangement of wheels which are normally idle, but which can be brought into play to support the weight of the entire machine and thus permit it to be readily moved along a log or the like.

A further object of the invention is to provide a sawing mechanism which may be used to equal advantage for felling trees or for sawing felled trees or logs into any desired lengths, and one which may also be used for cutting comparatively small wood, such as four foot cord wood into stove lengths.

With the foregoing and minor objects in view, the invention resides in the novel construction and combination of parts hereinafter described and claimed, the descriptive matter being supplemented by the accompanying drawings.

Figures 1 and 2 are respectively a side elevation and a top plan view of a machine constructed in accordance with my invention, the splitting mechanism being detached while the machine is used for sawing horizontal logs.

Figure 3 is an enlarged side elevation of the sawing mechanism and the adjacent parts of the main frame.

Figure 4 is a vertical transverse sectional view as indicated by line 4—4 of Fig. 3.

Figure 5 is a detail vertical section, partly in elevation, showing more particularly the means for adjusting the saw frame.

Figure 6 is a horizontal sectional view through the sawing mechanism showing a top plan view of the adjacent frame structure, showing the relation of parts when the main base frame rests on a horizontal log for use.

Figure 7 is a view similar to Fig. 6, but showing the relative positions of parts when the supporting wheels are brought into play to permit the machine to be shifted along a log.

Figure 8 is a transverse sectional view as indicated by line 8—8 of Fig. 7.

Figure 9 is an elevation of the sawing mechanism detached from the remainder of the machine.

Figure 10 is a vertical sectional view as indicated by line 10—10 of Fig. 9.

Figure 11 is a detail horizontal sectional view as designated by line 11—11 of Fig. 9.

Figures 12 and 13 are respectively a top plan and a side elevation showing the manner of using the machine for felling trees.

Figure 14 is a side elevation illustrating the way in which the sawing mechanism may be used in connection with a carriage for sawing wood into stove lengths.

Figure 15 is a plan view of one form of splitting mechanism and the adjacent parts of the frame structure.

Figure 16 is a side elevation of the parts shown in Fig. 15.

Figure 17 is a horizontal sectional view on line 17—17 of Fig. 16.

Figure 18 is a central vertical sectional view of the splitting mechanism shown in Figs. 15, 16 and 17.

Figure 19 is an elevation of the splitting mechanism above mentioned.

Figure 20 is a detail transverse section on line 20—20 of Fig. 18.

Figures 21 and 22 are respectively a side

elevation and an end view of the form of splitting mechanism used when the blocks of wood stand on end.

Figure 23 is a horizontal sectional view as designated by line 23—23 of Fig. 21.

Figure 24 is a vertical sectional view of the splitting mechanism shown in Figs. 21, 22 and 23.

Figure 25 is a fragmentary elevation showing more particularly some of the controlling parts for the splitting maul.

In carrying out my invention, I provide a horizontally elongated main supporting frame or base F, mount a sawing mechanism M at one end of said frame, provide a splitting mechanism at the other end thereof, and mount a suitable motor or engine E on the frame between the two mechanisms, for driving either of them as required.

The frame F includes a pair of parallel side bars 1 which are rigidly connected at each end by a transverse relatively short bar 2 and a longer transverse bar 3, the two being spaced apart as shown for instance in Figs. 2, 6 and 7. Appropriate vertically adjustable legs 4 are hinged at 5 to the ends of the bars 3 and any suitable locking means 6 may be employed for holding said legs at the most desirable angles with respect to said bars, and it will be obvious that the lengths of said legs may also be varied as required to meet conditions.

Slidable between the bars 2 and 3 at each end of the machine, are two transverse bars 7 and 8 which rest on the side bars 1 and are held in proper relation by strap irons or the like 9 as shown for instance in Figs. 6 and 7. At one end, each of the bars 7 and 8, carries a depending arm 10 pivoted thereto at 11 and provided on its lower end with a log engaging wheel 12, the arrangement being such that the arms 10 at each end of the machine straddle the upper portion of the log as shown for instance in Fig. 4, coiled springs or the like 13 being connected with said arms for swinging them inwardly into downwardly converging relation and holding their wheels 12 in contact with the log as shown in Fig. 4. When the arms 10 stand in this manner, the side bars 1 of the frame rest on the log as shown and said frame may then be steadied, not only by the legs 4, but by log engaging hooks 14 which are carried by the ends of the bars 7 and 8, opposite the arms 10. I make provision for oppositely shifting the bars 7 and 8 so that the arms 10 will be brought to the vertical positions shown in Fig. 8 thereby lifting the side bars 1 of the frame entirely from the log so that the entire machine may be shifted along said log as necessary. Since the hooks 14 are carried by the above mentioned bars 7 and 8, these hooks are loosened by shifting of said bars in the manner specified.

Any appropriate means may be employed for sliding the bars 7 and 8 as required, but I have shown a pair of levers 15 for this purpose, one lever being located at each end of the machine. These levers may well be fulcrumed on one of the strap irons 9 as shown in Figs. 6 and 7 and said levers are connected with the bars 7 and 8 by oppositely extending links 16. It thus follows that when either of the levers is shifted, the bars connected therewith will be moved in opposite directions. Any appropriate racks or the like 17 may be utilized for the purpose of securing the levers 15 in adjusted positions.

The construction of the sawing mechanism is disclosed clearly in Figs. 3 to 10 and these figures illustrate such sawing mechanism in use for sawing logs, while Figs. 12, 13 and 14 show other uses of the mechanism in question. An arched saw carrying frame 20 is provided, which is preferably formed of a single metal bar of hollow construction, the vertical arms 21 of said arched frame being provided with vertical tracks 22 which are receivable in channeled tracks 23 carried by the frame F, said channeled tracks being hinged to one of the bars 3 so that they swing into right angular relation with the frame as shown in Figs. 1, 3, 4, etc., or may swing downwardly into parallel relation with said frame as depicted in Fig. 13. The machine may thus be used for cutting either horizontal logs or growing trees. For adjusting the tracks 22 within the fixed tracks 23 and consequently for adjusting the frame 20 to feed the saw are gears 24 mounted on a shaft 25 carried by the tracks 23, said gears meshing with appropriate teeth 26 with which tracks 22 are provided (see Fig. 5). In the present showing, the gears 24 are mounted in the fixed tracks 23 but this arrangement need not be followed in all instances. The free ends of the arms 21 of the frame 20, are preferably curved outwardly in opposite directions as shown at 27 in Figs. 4, 8 and 9, and these outwardly turned ends are preferably braced by suitable plates 28 extending therefrom to the body portions of said arms. These plates carry adjustable bearings 29 for a pair of saw guiding wheels 30 which co-operate with a third wheel 31 in guiding a chain saw 32 of any suitable construction. The wheel 31 serves to drive the saw 32 and said wheel is preferably located at the crown of the arched frame 20, being here shown provided with a shaft 33 rotatably mounted in appropriate bearing plates 34 carried by said frame. A beveled friction wheel 35 is secured to the shaft 33 at the inner side of the frame 20 and a pair of friction wheels 36 and 37 are mounted on one of the plates 34 in contact with said wheel 35, said wheels 36 and 37 having a horizontal stub shaft 36'

and a vertical stub shaft 37′ respectively. When the frame 20 is used vertically, the stub shaft 36′ is driven from the motor E by means of an appropriate telescopic and flexible shaft 38, but when the saw is used horizontally as depicted in Figs. 12 and 13, the stub shaft 37′ is driven. In either case, the wheel 31 is rotated to drive the saw 32.

If desired, the entire sawing mechanism M may be removed from the frame F and suitably supported on a frame F′ so that the saw 32 will be vertically disposed for sawing wood into stove lengths. The frame F′ is supported on suitable legs 4′ and is provided with an engine E′ for driving the mechanism M. A suitable rolling carriage 40 is mounted on the frame F′ for feeding the wood to the saw.

At the end of the frame F which carries the splitting mechanism, the side bars 1 extend beyond the cross bar 3 as shown for instance in Figures 15, 16 and 18. These projecting bar ends are provided with a pair of transverse tracks 41 which support a plate or platform 42 so that it may be adjusted transversely of the frame F, suitable means 43 being employed for securing said platform in any position to which it may be adjusted. A pair of L-shaped standards 44 are secured to the platform 42 and vertical portions of said standards form tracks 45 between which an arched frame 46 (Figs. 15 to 19) is slidably mounted for vertical adjustment. This adjustment may well be effected by means of gears 47 on a shaft 48 and in mesh with appropriate teeth on the side bars of the frame 46, said shaft 48 being carried by the tracks 45. Extending across the frame 46 is a horizontal rock shaft 49 which is provided with a maul carrying arm 50, the maul proper being designated at 51. A cable 52 is trained over a suitable sheave 53 carried by the frame 46 and is wound on a clutch controlled drum 54 which is mounted on the platform 42 and when said cable is wound on the drum, the maul carrying arm 50 and the shaft 49 are turned to raise the former against the tension of an appropriate actuating spring 55. When the maul is raised to the proper extent, the clutch 56 of the drum 54 is released, so that the spring 55 comes into play to actuate the maul head 51 for the purpose of driving a wedge 51′ into a horizontal block or log as will be clear by reference to Fig. 18. For the purpose of throwing the clutch 56 in and out as required, novel provision is made.

A clutch controlling lever 57 is suitably mounted on the platform 42, one end of said lever having an appropriate running connection with the movable member of the clutch 56 while the other end of said lever is provided with a suitable guide which is here shown in the form of a fork 58 (see Figs. 15 and 17). A lever actuating member 59 is provided, said member being here shown in the form of an open rectangular frame, one of whose side bars 60 constitutes a vertical track receivable in the guide 58 and slidable within said guide when the frame 46 is adjusted vertically. The opposite side bar of the member 59 is provided with a fork 61 which is cooperable with a cam 62 carried by the rock shaft 49 as depicted clearly in Figs. 16, 17, 18 and 19. The member 59 is mounted on vertical trunnions 63 which are shown passing through appropriate horizontal bars 64 which are carried by the frame 46. It thus follows that as the arm 50 is moved to the limit by the cable 52, the cam 62 will rock the control member 59 on its pivot 63, so that the lever 57 is actuated to release the clutch 56, thereby throwing the drum 54 out of play and permitting the spring 55 to actuate the maul. As soon as the maul lowers, the cam 62 turns the member 59 in the opposite direction, thereby throwing the clutch 56 in and starting the drum 54, so that the cable 52 is again wound to raise the maul.

When using the construction above described, it will be observed that no matter to what extent the frame 56 is adjusted vertically, the member 59 will at all times be operatively associated with the lever 57, in view of the fact that its side bar or track 60 slides in the guide 58. It will also be observed that the platform 42 and all parts carried thereby may be adjusted transversely of the frame F upon the tracks 41, so that the wedge 57 may be driven at any required point.

In the present embodiment of my invention, I have shown the drum 54 loosely mounted on a shaft 65 which is mounted on the platform 42, said shaft being rotated by means of a worm 66 and a worm gear 67, the former being driven by an appropriate flexible shaft 68 from the motor E. The clutch 56 is slidably keyed on the shaft 65 and is thus continually driven, so that whenever said clutch is thrown into play, the drum 54 is turned to wind the cable 52. The moment the clutch is thrown out however the drum 54 may spin idly on the shaft to permit the maul to be actuated by its spring 55.

When the blocks of wood are to be split while standing on end, a different splitting mechanism is employed, as shown in Figs. 21 to 25. An arched frame 46ª is adjustable vertically between the tracks 45 by means of the gear wheels 47, and the side bars of said frame 46ª act as guides for a vertical reciprocating maul 51ª to which the cable 52 is connected. The maul 51ª is raised by the cable 52 but drops by gravity onto a suitable wedge or wedges 57ª, driven into the block as shown for instance in Figs. 21

and 22. In this form of the invention, an actuating member 59ª is employed for the clutch controlling lever 57 above described, one side bar of said member being received in the guide 58 while its other side bar is connected by links 70 with a pair of levers 71 which are mounted on one side of the frame 46ª, in position to be struck by a pin or the like 72 on the maul 51ª. When the maul is raised sufficiently by the cable 52, the pin 72 strikes the uppermost lever 71 and turns the member 59ª so that the clutch 56 is thrown out of play, but when the maul falls by gravity and the pin 72 strikes the lowermost of the levers 71, the member 59ª is rocked in the opposite direction so that the clutch and cable are again brought into use to raise said maul.

When sawing down trees as shown in Fig. 13, the legs of the frame may be swung outwardly so as to lower the entire machine to cut close to the ground.

From the foregoing, taken in connection with the accompanying drawings, it will be seen that I have provided a highly efficient and desirable machine for sawing and splitting wood in a variety of ways, and since probably the best results may be obtained from the several features shown and described, such features may be followed if desired. I wish it understood however that within the scope of the invention as claimed, numerous minor changes may well be made.

I claim:

1. A wood working machine having a horizontal base frame adapted to normally rest on a log, normally idle log-engaging wheels adapted to rest on a log and support said frame above the log while moving it along the same, and means for bringing said wheels into or out of contact with the log.

2. A wood working machine having a horizontal base frame adapted to normally rest on a log, normally idle log-engaging wheels adapted to rest on a log and support said frame above the log while moving it along the same, means for bringing said wheels into contact with the log and means for then pulling the frame along the log.

3. A wood working machine having a base frame adapted to normally rest on a log, slides movable transversely of said frame, normally idle log-engaging wheels carried by said slides and adapted to support said frame when moving it along a log, and means for moving said slides to bring said wheels into play.

4. A wood working machine having a base frame adapted to normally rest on a log, slides movable transversely of said frame, depending arms pivoted to said slides and adapted to straddle the upper portion of a log, log engaging wheels on the lower ends of said arms, springs for swinging said arms inwardly into downwardly converging relation, and means for moving said slides to dispose said arms vertically and raise the frame from the log.

5. A wood working machine having a base frame adapted to normally rest on a log, downwardly converging pivotally mounted arms depending from said frame and adapted to straddle the upper portion of the log, log-engaging wheels on the lower ends of said arms, and means for moving the upper ends of said arms inwardly toward each other to swing said arms to vertical positions and raise the frame from the log.

6. A wood working machine having a base frame adapted to normally rest on a log, a pair of transverse bars slidably mounted on said frame, means for oppositely moving said base, a normally idle log-engaging wheel on one end of each bar, and a log engaging hook on the other end of each bar, the wheel and hook of each bar being opposed to those of the other.

7. A machine of the class described comprising a horizontal base frame, a pair of vertical tracks hinged to the end of said base frame and foldable onto the same, an arched frame movable along said tracks, saw guiding wheels mounted on said arched frame, a chain saw trained around said wheels, vertical and horizontal stub shafts connected operatively with one of said wheels, and means for driving either of said stub shafts according to the position of the aforesaid arched frame and tracks.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

JAMES EDWIN ELDER.

Witnesses:
E. R. FUNK,
L. W. BOWLES.