

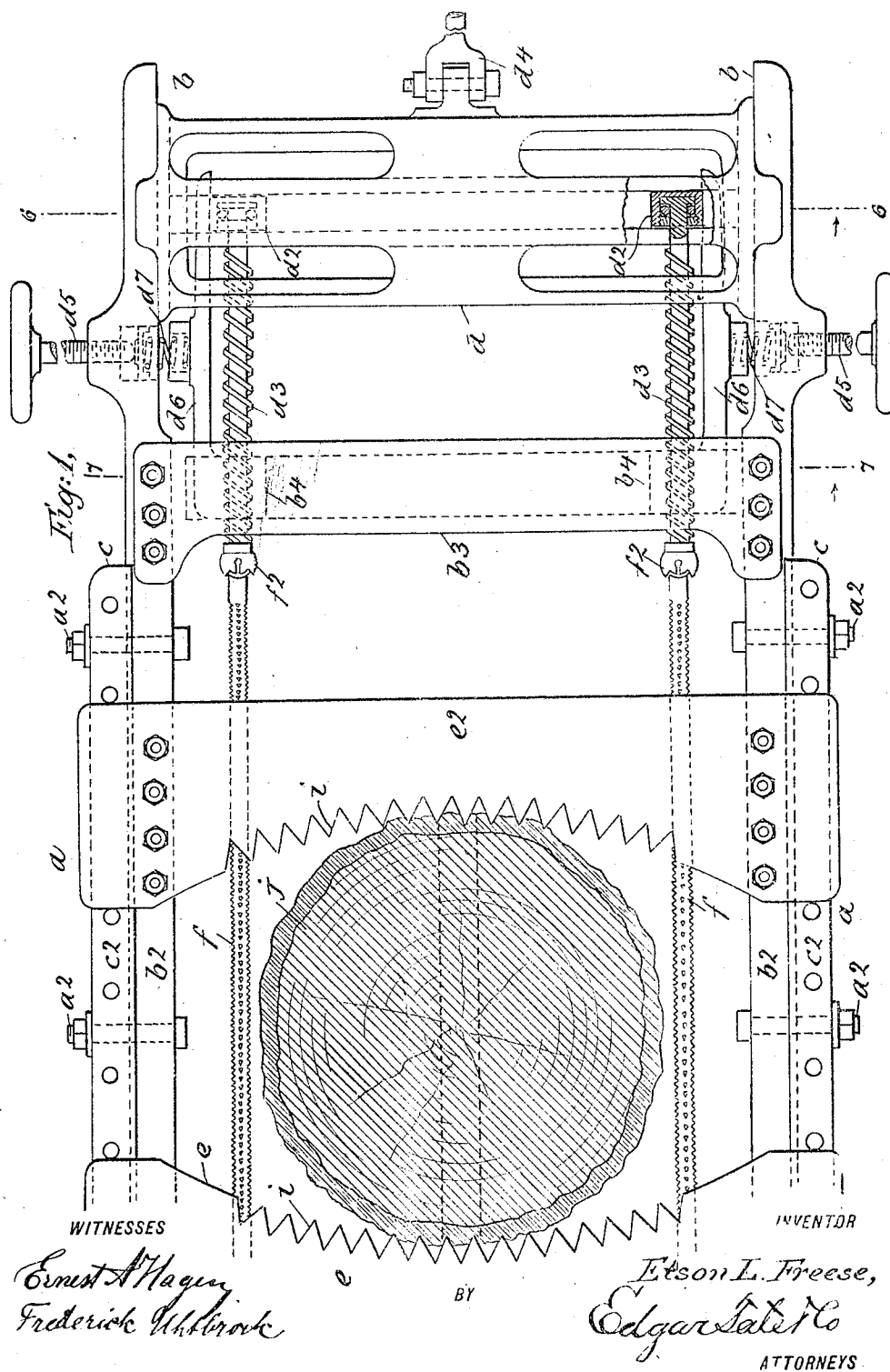
No. 839,464.

PATENTED DEC. 25, 1906.

E. L. FREESE.
APPARATUS FOR FELLING LARGE TREES.

APPLICATION FILED FEB. 2, 1906.

4 SHEETS—SHEET 1.



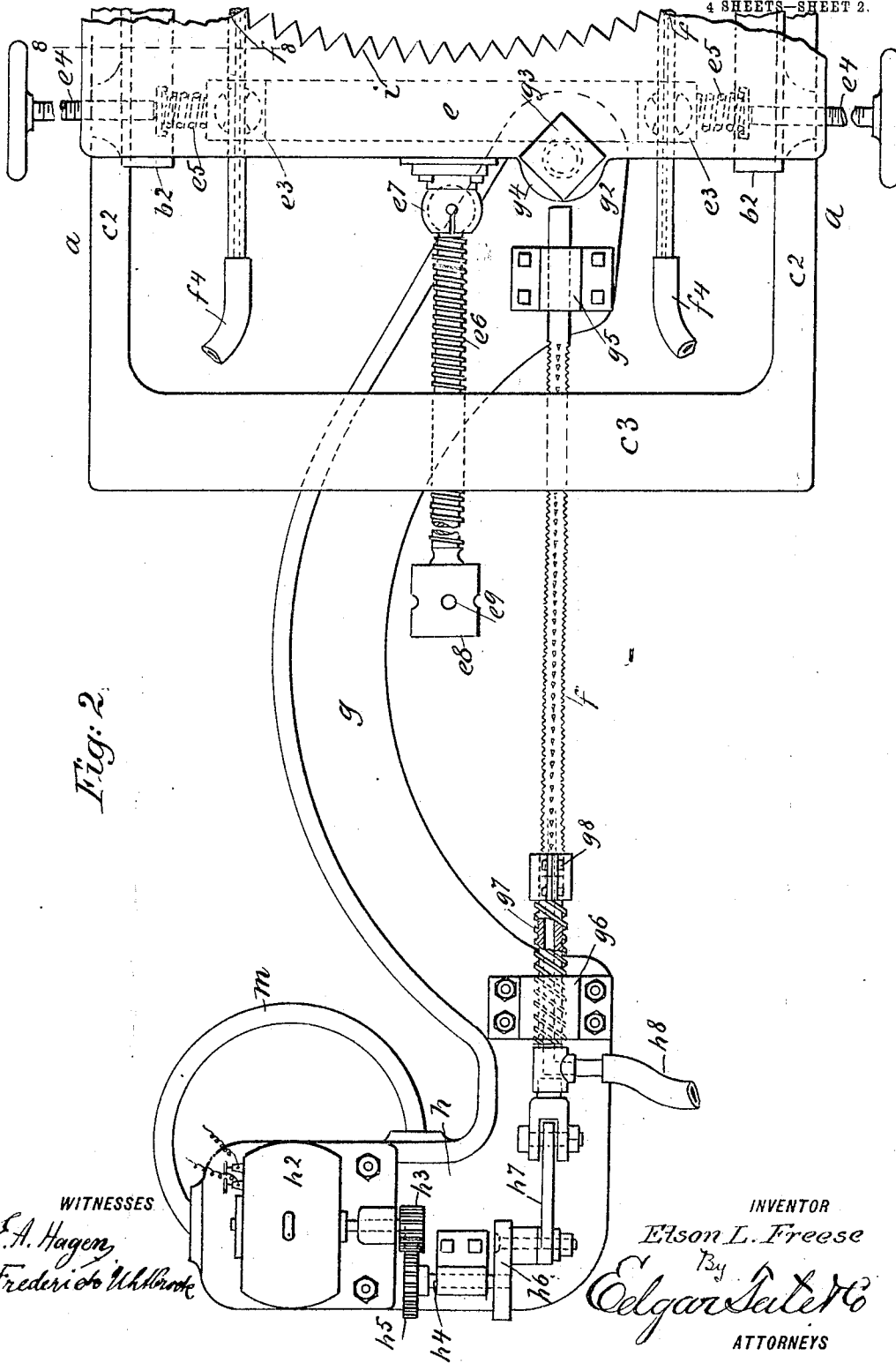
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4 SHEETS—SHEET 3.

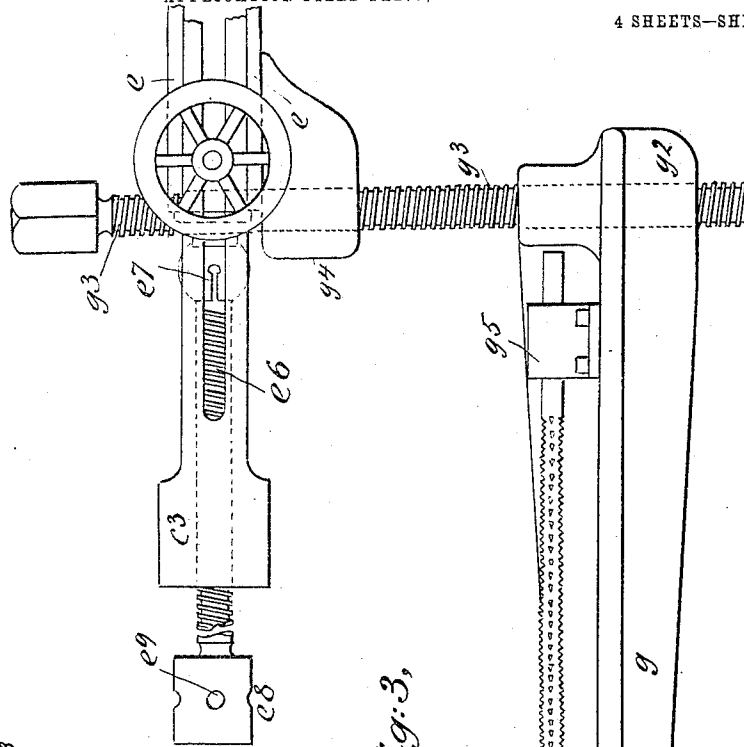
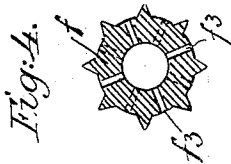
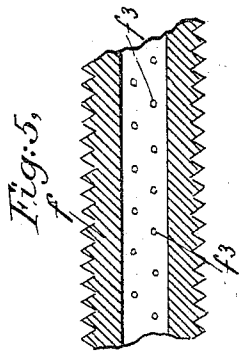
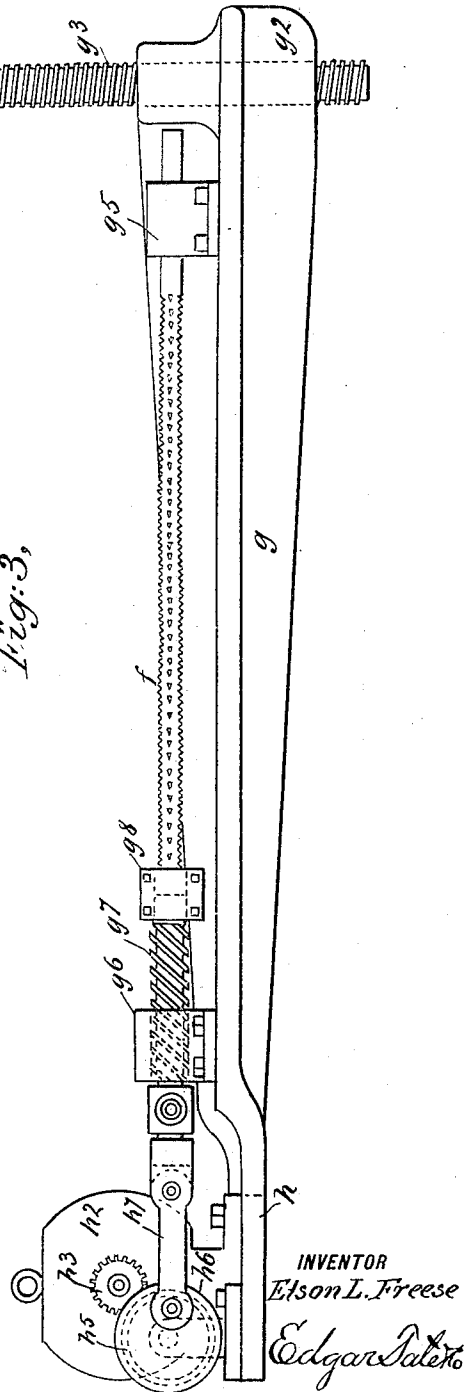


Fig. 3,



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4 SHEETS—SHEET 4.

Fig. 6,

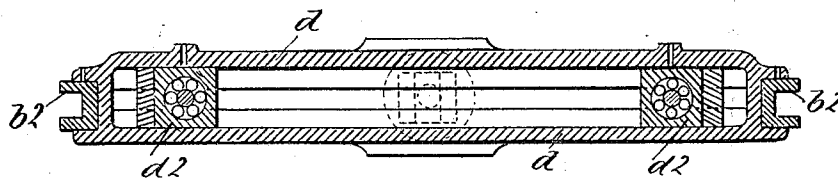


Fig. 7,

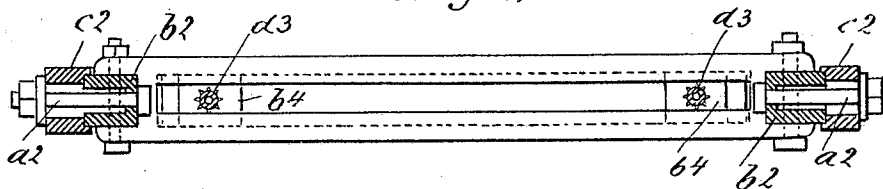


Fig. 8.

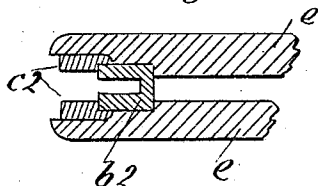
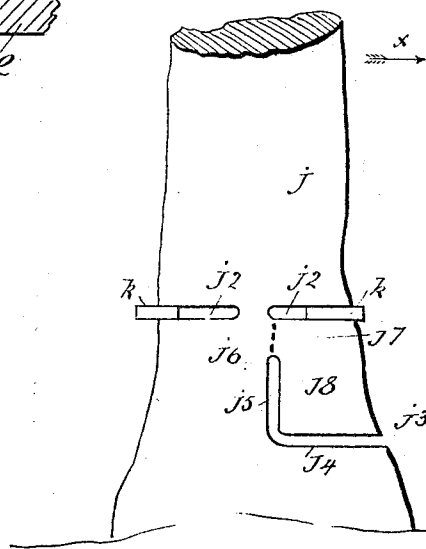


Fig. 9,



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UNITED STATES PATENT OFFICE.

ETSON L. FREESE, OF NEW YORK, N. Y.

APPARATUS FOR FELLING LARGE TREES.

No. 329,464.

Specification of Letters Patent.

Patented Dec. 25, 1906.

Application filed February 2, 1903. Serial No. 299,055.

To all whom it may concern:

Be it known that I, Etson L. Freese, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Apparatus for Felling Large Trees, of which the following is a specification, such as will enable those skilled in the art to which it appertains to make and use the same.

This invention relates to apparatus for felling large trees; and the object thereof is to provide an improved apparatus of this class combining the functions of a saw and rasp and by means of which large trees may be cut down or felled without waste of material and much more easily and expeditiously than by present processes.

The invention is fully disclosed in the following specification, of which the accompanying drawings form a part, in which the separate parts of my improvement are designated by suitable reference characters in each of the views, and in which—

Figures 1 and 2, taken together, show a plan view of my improved tree-felling apparatus; Fig. 3, a side view of one part of my improved apparatus; Fig. 4, a transverse section of a saw and rasp which I employ; Fig. 5, a longitudinal sectional view of a part of said saw and rasp; Fig. 6, a transverse section on the line 6 6 of Fig. 1; Fig. 7, a similar section on the line 7 7 of Fig. 1; Fig. 8, a partial section on the line 8 8 of Fig. 2, and Fig. 9 a side view of the bottom portion of the trunk of a tree and showing the result of the operation of my improved apparatus in felling a tree.

In the practice of my invention, as shown in the drawings, I provide a main oblong rectangular frame *a*, composed of two yoke-shaped supplemental frames *b* and *c*, composed, respectively, of parallel side members *b'* and *c'*, which are overlapped and connected by transverse bolts *a'*, any desired number of which may be employed. The outer ends of the side members *c'* of the supplemental frame *c* are connected by a cross-head *e'*, which may be formed integrally therewith or connected therewith in any desired manner, and the side members *b'* of the supplemental frame *b* are rigidly connected at a predetermined distance from the outer ends thereof by a cross-head *b'*, rigidly secured thereto.

Mounted between the outer ends of the side members *b'* of the supplemental frame *b*

and outside of the stationary cross-head *b'* is mounted a longitudinally-movable cross-head *d*, a longitudinal section of which is shown in Fig. 6, and in the opposite end portions of the cross-head *d*, inside of the parallel side members *b'* of the supplemental frame *b*, are placed transversely-movable bearing-blocks *d'*, and mounted in the opposite end portions of the stationary cross-head *b'* are transversely-movable nuts *b''*, through which are passed threaded shafts or screws *d''*, the outer ends of which are connected or secured in the blocks *d'* by universal joints or otherwise, and the inner ends of which pass through the nuts *b''*, which are similarly threaded, and said movable cross-head *d* is provided with a connecting-rod or similar device *d'*, by which it may be moved longitudinally of the main frame, and said cross-head may be operated by any suitable means.

Passing through the side members *b'* of the supplemental frame *b* between the cross-heads *b'* and *d* are adjusting-screws *d'*, which are designed to adjust longitudinally-arranged shoes *d''*, the ends of which bear on the bearing-blocks *d'* and the nuts *b''*, and between said screws and the shoes *d''* are placed spiral springs *d'*.

The main frame *a* is also provided, adjacent to the end thereof, opposite the cross-head *d*, with a longitudinally-adjustable cross-head *e*, and said main frame is also provided inwardly of the stationary cross-head *b'* with another cross-head *e'*, rigidly secured to the supplemental frame *b* or the side members *b'* thereof, and mounted in the cross-head *e* are bearing-blocks *e'*, which are adapted to be adjusted transversely of the main frame and longitudinally of the cross-head *e* by screws *e'*, similar to the screws *d'* and between which and the bearing-blocks *e'* are placed spiral springs *e'*.

The cross-head *e* may be adjusted longitudinally of the main frame by a screw *e''*, which passes through the cross-head *e'* of the supplemental frame *c* and is connected with the cross-head *e* by a ball-and-socket or other suitable connection *e'*, and said screw *e''* is provided at its outer end with a head *e''*, having a transverse hole *e''*, into which a suitable device may be inserted for turning said screw.

I also provide two combination saws and rasps *f*, which are preferably tubular in form and connected with the inner ends of the screws *d''* by universal or other suitable coup-

lings f^2 , and said combination saws and rasps pass through the bearing-blocks e^3 and are free to move longitudinally therethrough, and the said combination saws and rasps are provided with radial perforations or holes f^3 , and in practice I connect with the ends thereof, opposite the coupling at f^2 , flexible or other pipes f^4 , by means of which water may be supplied to said saws and rasps.

The construction hereinbefore described constitutes the main part of my improved apparatus; but in practice I also provide a supplemental part comprising a strong segmentally-curved arm g , through the head g^2 of which is passed a threaded bolt g^3 , which passes downwardly and vertically through a suitable support g^4 , connected with the cross-head e , and by means of which said arm may be raised and lowered. The arm g is provided at its inner end with a bearing g^5 and at its outer end with a bearing g^6 , through which is passed a screw g^7 , and mounted in and movable in the bearing g^6 ; longitudinally of the arm g , is a combination rasp and saw f , similar to those mounted in the main frame, and one end of which is connected with the screw g^7 at g^6 in any desired manner.

The arm g is provided with a head h , on which, in the form of construction shown, is mounted an electric motor h^2 , the power-shaft of which is provided with a pinion h^3 , which is geared in connection with a shaft h^4 by means of a gear-wheel h^5 , and the shaft h^4 is provided with a crank h^6 , which is placed in operative connection with the screw g^7 by a crank pin or link h^7 . The screw g^7 is preferably made hollow, and connected with the end thereof adjacent to the crank coupling or connection is a flexible tube h^8 , by means of which water may be supplied to said screw and to the combination rasp and saw f , which is connected with the screw g^7 through the coupling g^6 .

The inner sides of the cross-heads e^2 and e are preferably curved or segmental in form and are provided with teeth i , and the operation will be readily understood from the foregoing description, when taken in connection with the accompanying drawings and the following statement thereof: In Figs. 1 and 9 I have shown at j the trunk of a tree, and in practice the separate parts of the main frame are disconnected and adjusted on the trunk of the tree, as indicated in Fig. 1, and the cross-head e is forced inwardly, so that the trunk of the tree will be securely grasped and held on the opposite sides thereof. The bearings or supports of the saws f of the main frame are then adjusted so as to cause said saws to bear on the opposite sides of the tree, and the cross-head d is then operated. This operation of the cross-head d gives the saws f in the main frame a longitudinal movement and also a rotary movement, the rotary movement being accom-

plished by means of the screws d^3 when they pass through the nuts b^4 , and this rotary movement is, as will be understood, an intermittent movement in opposite directions. At the same time with the construction shown in the drawings water is admitted to the saws or combination saws and rasps through the tubes f^4 , and the cuts in the tree are kept clean and the saws are kept cool.

It will be understood that the saws f may be forced inwardly gradually as the cutting proceeds by means of the screws d^6 and e^4 , and the saws f may thus be kept in proper position to operate on the trunk of the tree at all times.

In the above-described operation transverse slots or openings j^2 are cut in the opposite sides of the trunk of the tree, as shown in Fig. 9, and when the said cutting proceeds until the said slot or opening approaches the transverse center of the trunk of the tree the operation of the saws in the main frame is discontinued, and the arm g is swung around until the saw f supported thereby bears on the trunk of the tree at j^3 . The saw f , supported by the arm g , is then operated by the motor h^2 or in any desired manner, and a transverse slot j^4 is cut in the trunk of the tree to a predetermined depth, at which time the screw g^8 is gradually turned so as to gradually raise the arm g , during which time the saw f , carried by said arm, is still operated, and this cuts an upwardly-directed slot or opening j^5 in the tree, and when this slot or opening reaches a predetermined point, as shown at j^6 , the operation of the saw f , carried by the arm g , is discontinued, the screw g^8 is turned in the opposite direction, the arm g is lowered and swung outwardly, so as to disconnect the saw f carried thereby from the trunk of the tree, and the main frame is also detached from the tree. Previous to detaching the main frame and also previous to cutting the slots j^4 and j^5 wedges k are driven into the slots or openings j^2 , and in detaching the main frame the saws f carried thereby are drawn outward longitudinally.

After the apparatus has been detached from the tree a wedge is driven into the wood at the point indicated by the dotted line j^7 , so as to separate the block (indicated at j^8) from the body of the tree, and the tree will then fall in the direction indicated by the arrow x .

My invention is not limited to the form of saws or combination saws and rasps herein shown and described, and saws of ordinary form or of any preferred construction may be operated in any way by an apparatus constructed as herein described, and the word "saw" as used herein and in the following claims is intended to cover any device which will operate in the manner herein described to cut transverse grooves in the opposite sides of the trunk of a tree, and various changes in

and modifications of the other features of construction comprising the main frame, the separate parts thereof, the parts connected therewith, the arm *g* and the parts connected therewith may be made without departing from the spirit of my invention or sacrificing its advantages.

My invention is also not limited to the use of the arm *g* and the parts connected therewith as herein described, and other means may be employed for cutting the slots *j'* and *j''* in the trunk of the tree.

The arm *g* or the head thereof is provided with a handle *m*, by which it may be swung into different positions, and in practice said arm or the free end thereof may also be provided with any suitable support on which the free end of said arm may travel. It will be understood that in practice the arm *g* is made of considerable weight, and a suitable support for the free end thereof will be necessary.

The saws *f* are not specifically claimed in this case, but are made the subject of a separate application filed by me March 29, 1906, Serial No. 308,659.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an apparatus of the class described, comprising a main frame adapted to be connected with the body of a tree transversely thereof and provided with saws movable longitudinally therein and adapted to bear on the opposite sides of said tree, and means for operating said saws, substantially as shown and described.

2. In an apparatus of the class described, a frame adapted to be connected with the trunk of a tree transversely thereof, means whereby said frame may be caused to grasp and hold the opposite sides of the tree, and saws mounted longitudinally in said frame in the opposite sides thereof, means for forcing said saws into contact with said tree, and means for operating said saws, substantially as shown and described.

3. In an apparatus of the class described, a frame adapted to be connected with the trunk of a tree transversely thereof, means for securing said frame to said tree, saws mounted in the opposite sides of said frame and movable longitudinally thereof and transversely thereof, and means for operating said saws, substantially as shown and described.

4. In an apparatus of the class described, a frame adapted to be connected with the trunk of a tree transversely thereof, means for securing said frame to said tree, saws mounted in the opposite sides of said frame and movable longitudinally thereof and transversely thereof, and means for operating said saws, said frame being also provided at one end with an arm movable in horizontal

and in vertical planes and provided with a saw, and means for operating the same, substantially as shown and described.

5. In an apparatus of the class described, a main frame, means for connecting said frame with the trunk of a tree transversely thereof, saws mounted longitudinally in said frame and movable toward and from said tree, means for forcing said saws into contact with said tree, and means for operating said saws, said frame being also provided at one end with a pivoted and curved arm, a saw mounted in said arm, means for operating said saw, and means whereby said arm may be moved vertically, substantially as shown and described.

6. In an apparatus of the class described, a main oblong frame composed of separate detachably-connected parts and provided with stationary and longitudinally-adjustable cross-heads adapted to grasp and hold the trunk of a tree, said frame being also provided with longitudinally-arranged rotary and rasping saws movable transversely of the frame and longitudinally thereof, and means for operating said saws, comprising a cross-head movable longitudinally of the frame, screws connected therewith, a stationary cross-head, and nuts mounted in said cross-head and through which said screws are passed, said screws being connected with said saws, substantially as shown and described.

7. In an apparatus of the class described, a main oblong frame composed of separate detachably-connected parts and provided with stationary and longitudinally-adjustable cross-heads adapted to grasp and hold the trunk of a tree, said frame being also provided with longitudinally-arranged rotary and rasping saws movable transversely of the frame and longitudinally thereof, and means for operating said saws, comprising a cross-head movable longitudinally of the frame, screws connected therewith, a stationary cross-head, and nuts mounted in said cross-head and through which said screws are passed, said screws being connected with said saws, said main oblong frame being also provided at one end with an arm adapted to swing in a horizontal plane, means for moving said arm vertically and a saw connected with said arm and means for operating the same, substantially as shown and described.

8. In an apparatus of the class described, a main oblong frame adapted to be connected with the body of a tree transversely thereof, saws mounted in said frame and movable longitudinally and transversely of said frame, said saws being tubular in form and provided with a plurality of rows of teeth and also with longitudinally-arranged perforations, and means for moving said saws longitudinally of the frame and for giving them a rotary motion, substantially as shown and described.

9. In an apparatus of the class described, a main oblong frame adapted to be connected with the body of a tree transversely thereof, saws mounted in said frame and movable longitudinally and transversely of said frame, said saws being tubular in form and provided with a plurality of rows of teeth and also with longitudinally-arranged perforations, and means for moving said saws longitudinally of the frame and for giving them a rotary motion, comprising a cross-head movable longitudinally of said frame, screws connected therewith and with said saws, and nuts mounted in said frame and through which said screws are passed, substantially as shown and described.

10. In an apparatus of the class described, a frame composed of separate detachable and adjustable members each of which is open at

one end, said frame members being provided with cross-heads adapted to grasp and hold the trunk of a tree, said frame being also provided at one end with a longitudinally-movable cross-head, and a saw in operative connection with the longitudinally-movable cross-head and also movable transversely of the frame and toward and from the trunk of the tree, substantially as shown and described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of the subscribing witnesses, this 31st day of January, 1906.

ETSON L. FREESE.

Witnesses:

FREDERICK UHTBROCK,
JOHN BENDER.