T. W. SIMPSON.

DEBARKING MACHINE.

APPLICATION FILED JUNE 15, 1912.

1,051,460.

Patented Jan. 28, 1913.

7 SHEETS—SHEET 1.

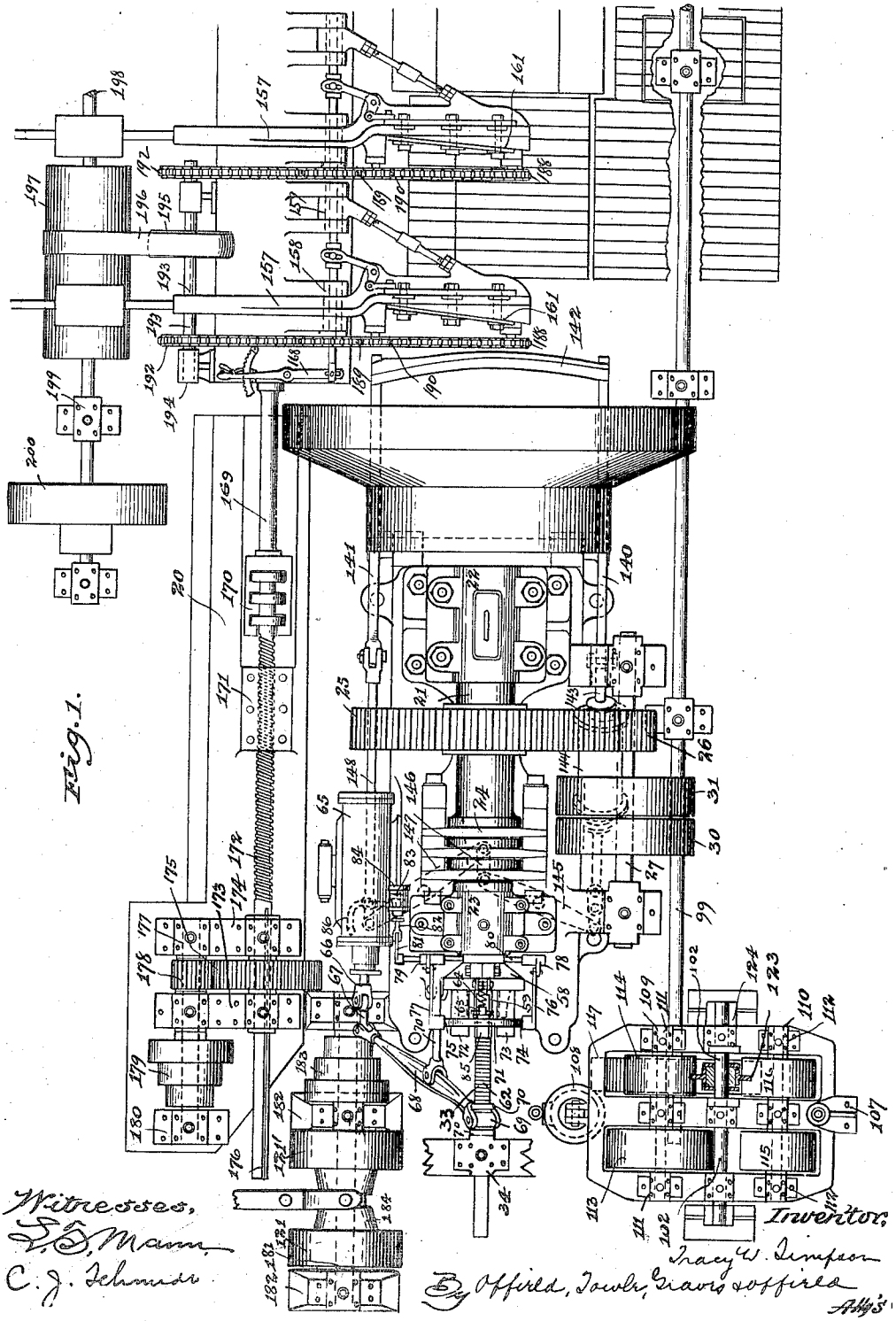

Fig. 1.

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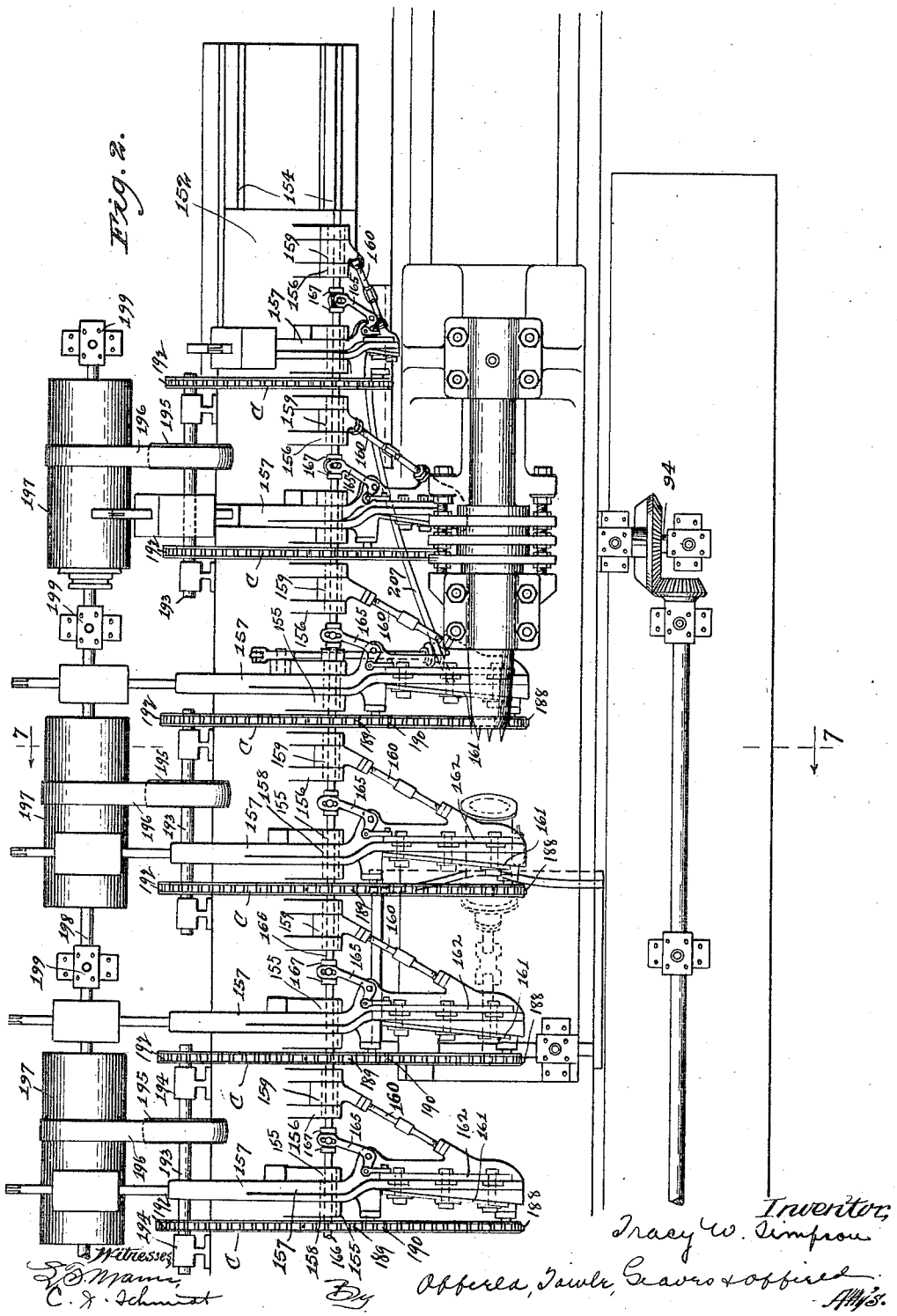
Fig. 2.



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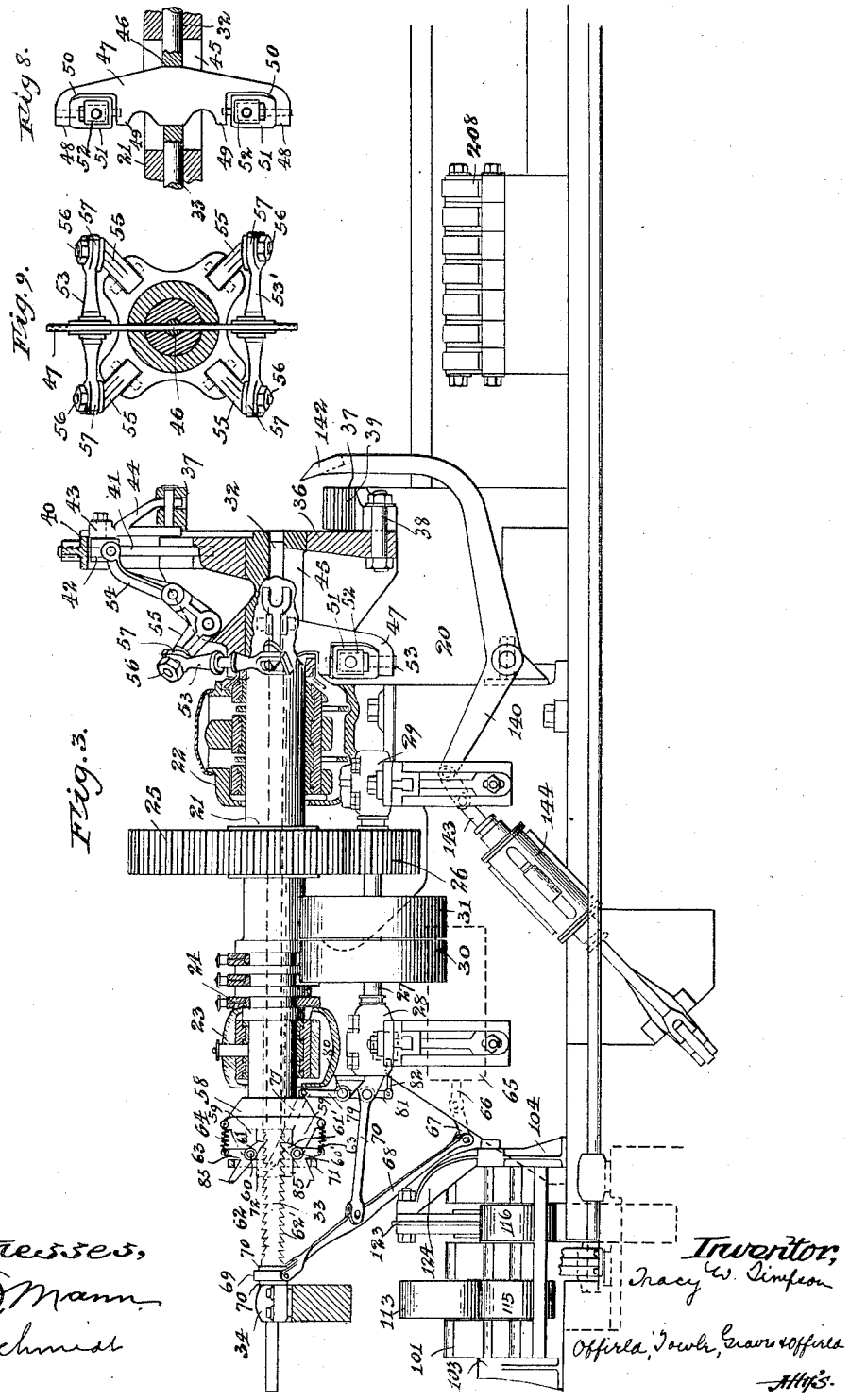

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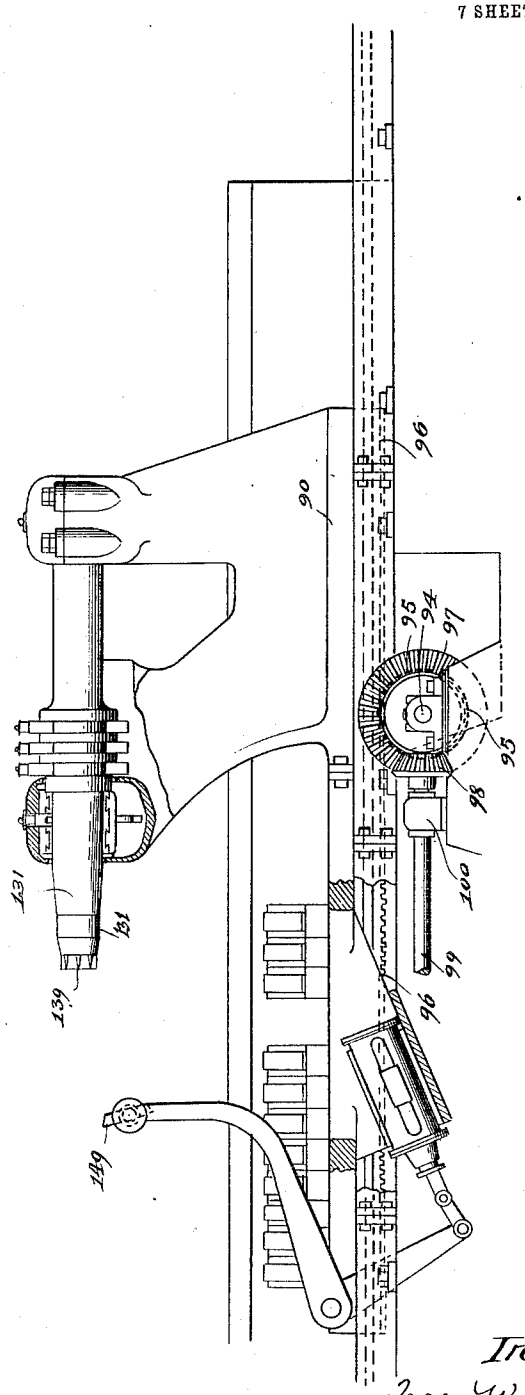

Fig. 4.

Witnesses,
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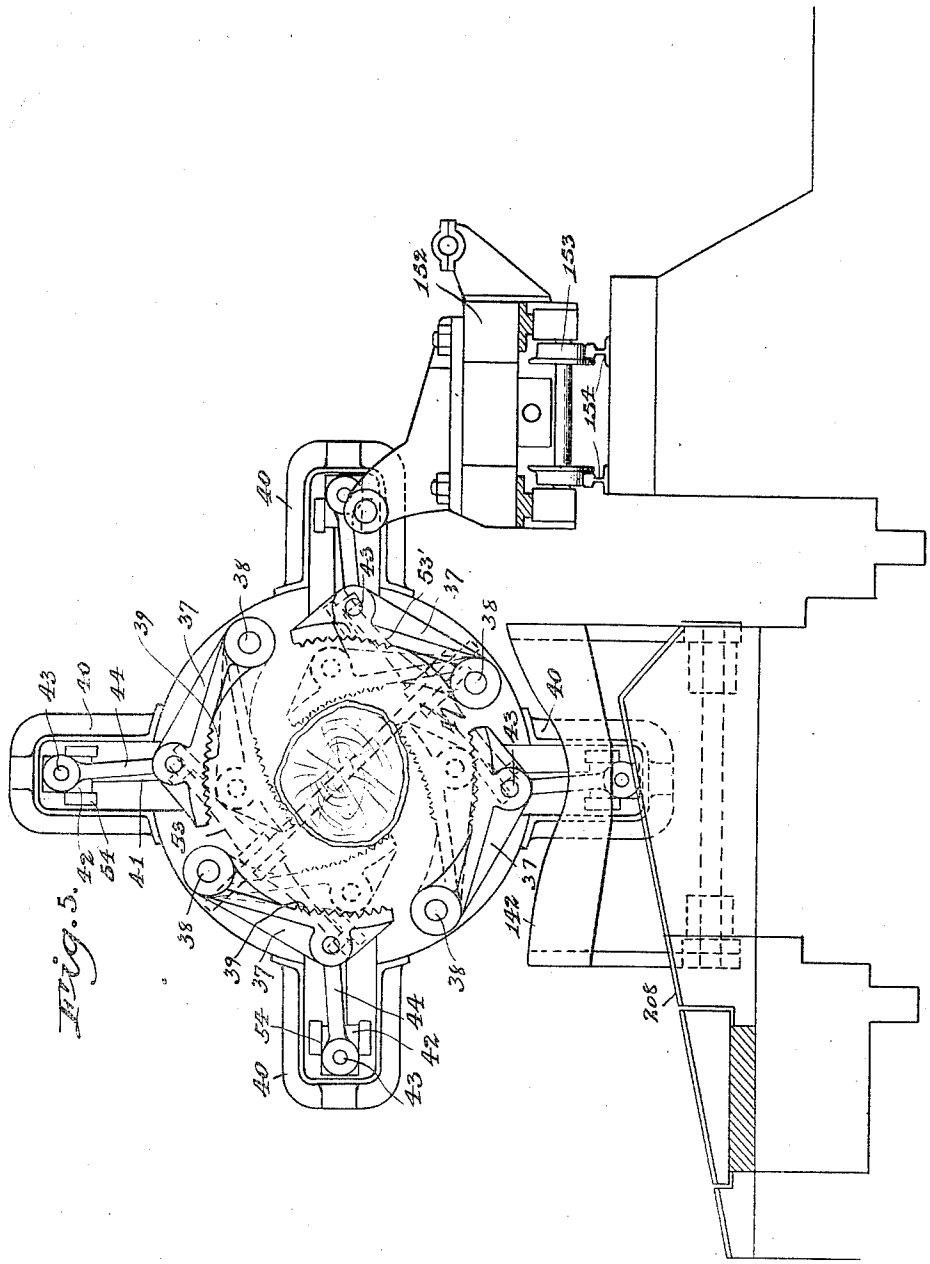

Fig. 5.

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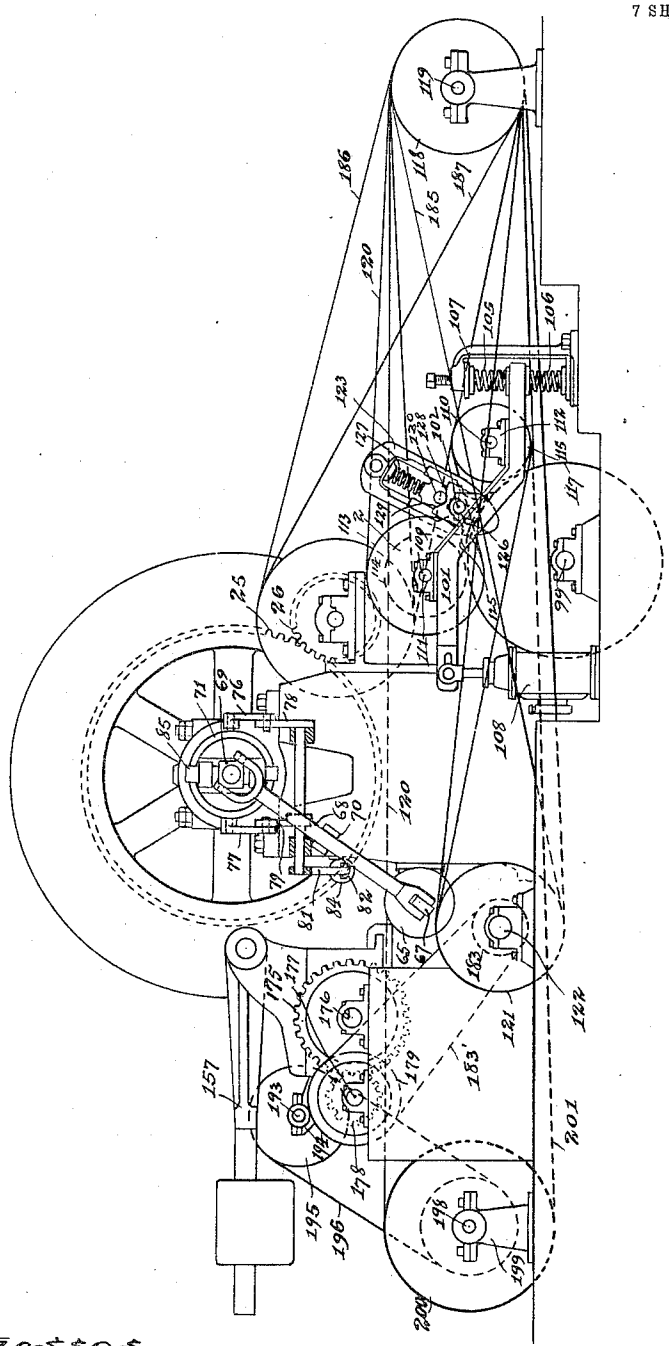
7 SHEETS—SHEET 6.

Fig. 6.



Witnesses,
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7 SHEETS—SHEET 7.

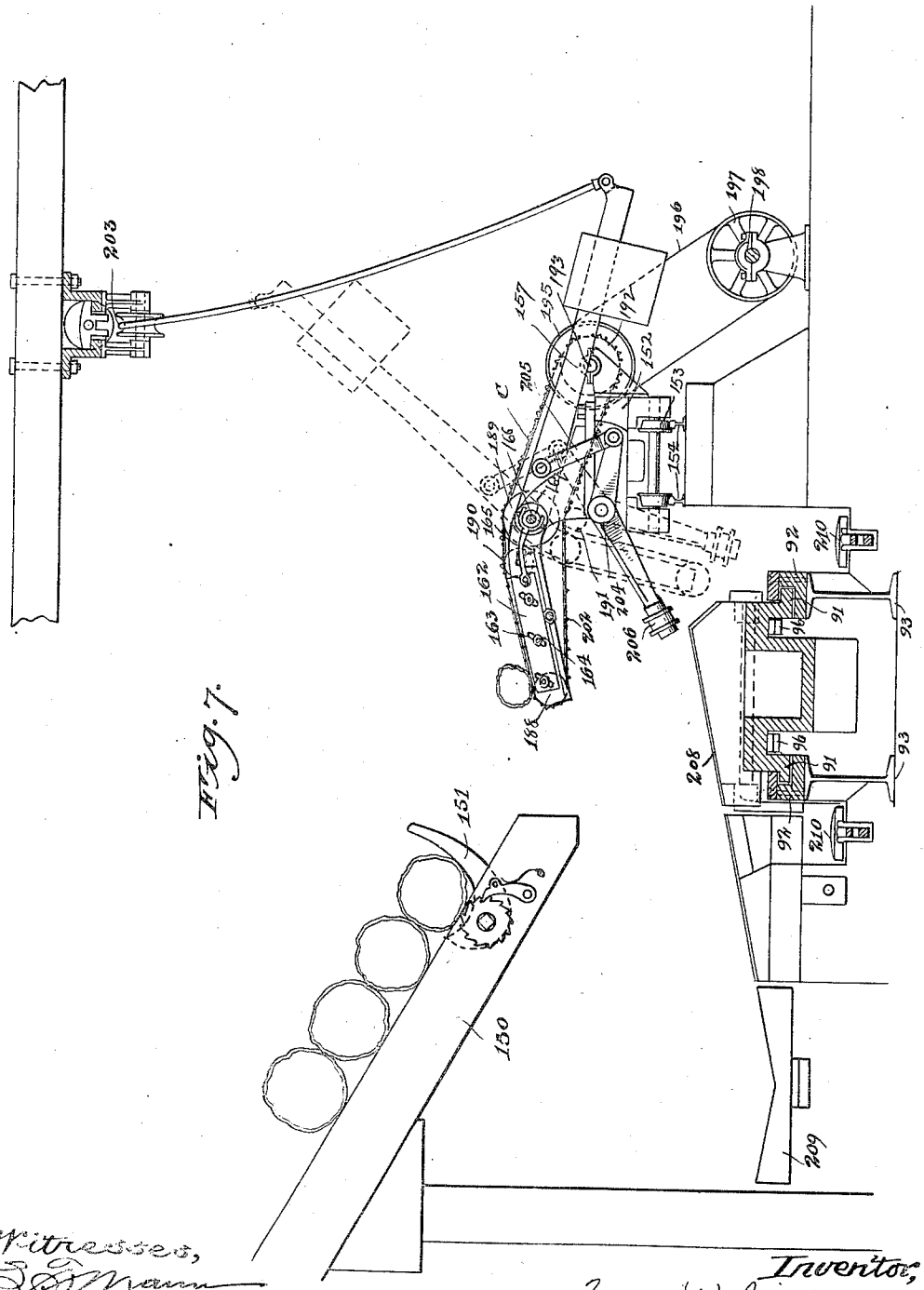

Fig. 7.

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UNITED STATES PATENT OFFICE.

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DEBARKING-MACHINE.

1,051,460. Specification of Letters Patent. **Patented Jan. 28, 1913.**

Application filed June 15, 1912. Serial No. 703,954.

To all whom it may concern:

Be it known that I, TRACY W. SIMPSON, of the city of Grand Rapids, county of Kent, and State of Michigan, have invented certain new and useful Improvements in Debarking-Machines, of which the following is a specification.

My invention relates to de-barking machines and contemplates improved features of construction and arrangement and operation which will enable bark to be more efficiently removed from logs.

Among the important objects of the invention are to provide a construction and arrangement for supporting logs and for causing axial rotation thereof; to provide a cutting arrangement in which knives are moved bodily parallelly with the log while the log is rotating, and to provide means for causing said knives to exert pressure against the log so that their upward force may act in opposition to the weight of the log to thereby neutralize the bearing pressure due to the log weight; to provide such construction and arrangement that the side thrust on the bearings of the knife supporting frames due to the tangential drag of the knives is approximately neutralized by placing the knives at an angle with the log axis so that the component of weight of the log exerted along the lines of the edges of the knives will neutralize the tangential drag; to provide individual gage mechanism for each knife to gage the depth of the cut and to provide means for effecting simultaneous adjustment of the various gage mechanisms; to provide improved head-stock clutch mechanism which is differential in its action to clamp one end of the log with uniform pressure and to center the log; to provide improved means for operating the clutch mechanism and for locking it rigidly in clutch engagement with the log; to provide improved feed mechanism for receiving the log and for raising it and for moving it longitudinally to carry one end thereof into the clutch mechanism; to provide an adjustable tail-stock so that logs of different length may be accommodated; to provide means for automatically preventing interference between the knife supporting frames and the tail-stock structure during relative movement of such frames and structure; and in general to provide more efficient and more practical construction and arrangement in machines of the class referred to.

The various features of the invention will be clearly understood by reference to the following specification and the drawings forming part of such specification.

Figures 1 and 2 are respectively plan views of the head-stock and tail-stock sections of the machine, Figs. 3 and 4 are respectively side elevational views of the head-stock and tail-stock sections, Fig. 5 is an elevational view looking from the left of the head-stock structure shown in Fig. 1, Fig. 6 is an elevational view looking from the left end of the machine, Fig. 7 is a view looking from plane 7—7 of Fig. 2, Fig. 8 is a detached view partly in section of the end of the head-stock shaft and showing the arrangement of the clutch mechanism driving cross-beam, and Fig. 9 is a view looking from the rear of the head-stock showing the connection of the cross-beam with the lever mechanisms connecting with the clutch jaws.

Referring to the head-stock, this mechanism is mounted on suitable foundation frame-work 20. The head-stock shaft 21 is supported and journaled in front and rear bearing frames 22 and 23, and also engages in a thrust bearing structure 24. Between the bearing structures 22 and 24 the shaft carries the drive gear 25 with which meshes a driving pinion 26 mounted on the shaft 27 journaled in bearing frames 28 and 29 supported on the foundation frame 20. The shaft 27 carries belt pulleys 30 and 31. The shaft 21 is hollow, having the axial bore or passageway 32 which is of circular cross section except at the left end of the shaft where it is a square cross section. Extending through this passageway is the clutch mechanism controlling rod 33 whose inner end is cylindrical to fit the part of the passageway which is circular, while its outer end is square to fit the square part of the passageway so that this rod 33 although longitudinally movable within the shaft 21 must rotate therewith. To support the outer end of the rod 33, this end is round and journals in a suitably supporting bearing frame 34. The shaft 21 carries at its inner end a circular head 36 which supports the clutch jaw members and the operating

mechanism therefor. As best shown in Fig. 5, four clutch jaws 37 are provided, each pivoted at one end on a stud 38 extending forwardly from the head frame 36, these pivot studs being near the periphery of the head frame equidistant from the center and spaced 90 degrees apart. These clutch levers are adapted to swing toward and away from the head frame center and the inner face of each jaw has teeth or ridges 39 for obtaining a firm hold on the log to be supported. Extending radially from the periphery of the head frame and over the free ends of the jaw members are the yoke frames 40. Extending centrally through each of these frames and radially with reference to the head frame 36 is a guide rod 41 secured at its outer and inner ends in the yoke frame and in the head frame respectively. Within each yoke frame a cross head or block 42 is slidable on the rod 41, and extending forwardly from the cross head is a pin 43 for pivoting the upper end of the connecting rod structure 44 whose lower end is pivoted to the free end of the adjacent clutch member 37 so that upon reciprocation of the cross head 42 the clutch members 37 will be swung toward or away from the center of their supporting frame 36.

The mechanism will now be described for causing the jaws to grip the log with practically equal pressure, no matter how irregular the log may be. This mechanism is controlled upon movement of the rod 33, slidable within the head-stock shaft 21. Referring to Figs. 3, 5, 8, 9, the shaft 21 at its inner end has the diametrical slot 45, and the inner end of the rod 33 has a slot 46 registering with the slot 45. Extending through both slots is a cross frame 47 in the form of a plate, this frame sliding through slot 45 as the rod 33 is reciprocated. The plate 47 has at each end an outer and inner lug 48 and 49 forming the pocket 50 for receiving the rectangular frame 51 which trunnions in the lugs as indicated. A block 52 is slidable in each trunnion frame on the longitudinal walls thereof and supports the cross beam 53 at an intermediate point. With this arrangement the transverse beams 53 and 53′ at the ends of the plate 47 will move bodily with the plate upon reciprocation of the rod 35, and these transverse beams have also limited bodily movement toward and away from the rod 33 and can also swing with their trunnioned supporting frames. The ends of the cross beams 53 and 53′ are connected by suitable mechanism with the cross heads 42 which control the clutch jaws. A link 54 is pivoted to each cross head 42 and connects with one arm of a bell crank lever 55 pivoted at its elbow to the head frame 36 adjacent the base of the corresponding yoke frame, the other arm of the bell crank lever having a pin extension 56 for receiving the adjacent slotted end 57 of one of the cross beams. As best shown in Figs. 3, 5 and 9, the cross beam 53 has slotted engagement at its ends with the bell crank levers associated with the cross heads connected with the top jaw and with the jaw at the left (see Fig. 5), while the lower cross beam 53′ has slotted connection at its ends with the bell crank levers connected with the cross heads for the lower jaw and for the jaw at the right (see Fig. 5).

With the above construction and arrangement, when the rod 33 is moved outwardly, the outer arms of the bell crank levers will be drawn toward the rod and the cross heads are moved radially outwardly and the jaws moved apart ready to receive a log or to release a log. Upon inward movement of the rod 33, the bell crank levers are rotated to force the cross heads and thereby the jaws together. On account of the free connection of the cross beams with the plate 47 and the free connection of these beams with the bell crank levers, the two jaws of one set are free to move with reference to each other although both cross beams are advanced at an equal rate of speed so that when the rod 33 is moved inwardly the jaws are free to accommodate themselves to a log, no matter how irregular it may be, and the log will be gripped with practically equal pressure by all the jaws, and the log will be centered with reference to the head frame 36. The tail-stock mechanism for supporting the other end of the log will be described later.

Mechanism for controlling the reciprocation of the rod 33 is best shown in Figs. 1, 3, and 6. The outer end of shaft 21 carries a head 58 from which two diametrically opposite sets of lugs 59 extend. Supported by one set of lugs is a pin 60 on which is mounted the pawl 61 for coöperating with the ratchet teeth 62 cut in the upper surface of the rod 33. The other set of lugs supports the pin 60′ from which extends the pawl 61′ for coöperating with the ratchet teeth 62′ cut in the lower surface of the rod 33. Each pawl has an arm 63 extending outwardly and connected by a spring 64 with the head 58, the springs tending to hold the pawls in engagement with their respective ratchet teeth. The arrangement of the pawls and ratchet teeth is such that the ratchet teeth will glide past the pawls when the rod 33 is moved inwardly, but will be engaged by the pawls to be locked against outward movement until the pawls are withdrawn therefrom.

Any suitable means may be provided for controlling the reciprocation of the rod 33. As shown, such reciprocation is controlled by fluid under pressure. A fluid cylinder 65 is suitably mounted on the foundation frame and the piston rod 66 is connected by the link 67 with one end of the rock lever 68,

whose other end is pivoted to a collar 69 operating between shoulders 70 on the rod 33. The lever 68 is piovted at an intermediate point to the outer end of the link 70 whose inner end is pivoted to some stationary frame part. With this arrangement, when the piston rod of cylinder 65 is forced outwardly the rod 33 will be slid inwardly and the clutch jaws will be moved toward each other, and when the piston rod is drawn inwardly the rod 33 is withdrawn upon release of the pawls therefrom and the clutch jaws are moved apart. After inward movement of the rod 33 has been effected by the cylinder mechanism and connecting lever mechanism, the pawls grip the rod and take up the strain thereof so that the cylinder mechanism may relax and be free from further strain.

Means are provided for releasing the pawls from the rod 33 so that this rod may be withdrawn and the log released. As shown, this means comprises a ring 71 adapted to slide on upper and lower segmental lateral projections 72 and 73 on the head 58. Front and rear trunnion pins 74 and 75 receive the outer ends of links 76 and 77, whose inner ends pivot to arms 78 and 79 secured to a shaft 80 suitably journaled, and from one of whose ends the arm 81 extends downwardly and has connection with the outer end of the piston rod 82 extending from a piston 83 within the cylinder 84. When this piston is out, the various levers and the ring 71 are in a position shown in Figs. 1 and 3, the ring being at the base of the diagonal cam extensions 85 and 85′ on the pawls 61 and 61′ respectively. When the piston in cylinder 84 is moved inwardly, the connecting mechanism between the piston and the ring will cause the ring to be moved outwardly and the cam extensions will be brought together and the pawls will swing away from the ratchet teeth on rod 33 so that the rod is released, the rod being then withdrawn when the connecting rod in cylinder 65 is caused to be drawn inwardly. A preferable arrangement is to have the fluid connection 86 between the outer ends of the cylinders 65 and 84. With this arrangement when fluid is admitted to the outer end of cylinder 65, the piston rod 66 being unable to move on account of locking engagement of the pawls and the ratchet teeth, the fluid will first move inwardly the piston in cylinder 84 so that the pawls will be released by the ring 71 and thereupon cylinder 65 will become effective and the rod 33 will be withdrawn. When fluid is admitted to the inner ends of the cylinders, the rod 33 will be shifted inwardly and the ring restored to its normal position to allow the pawls to coöperate with the ratchet teeth to lock the rod in its adjusted position.

The tail-stock mechanism for supporting the opposite end of the log is best shown in Figs. 2, 4, and 7. The base of the tail-stock frame 90 has guide flanges 91 for engaging in parallel guide frames 92 mounted on suitable beams 93 (Fig. 7). A shaft 94 extends transversely below the guide ways and carries pinions 95 for engaging with racks 96 secured to the under side of the tail-stock frame face. The end of the shaft carries a beveled gear 97 with which a beveled pinion 98 meshes, this pinion being secured at the inner end of the drive shaft 99 journaled in suitable bearings 100. The mechanism for controlling the operation of the drive shaft 99 is best shown in Figs. 1, 3, 6.

A rectangular frame 101 of approximately Z shape side elevation is pivoted at an intermediate point on a shaft 102 journaled in bearing standards 103 and 104. The lower end of this frame is yieldably held between compression springs 105 and 106 supported in a bracket 107. The other end of the frame connects with the piston mechanism of a cylinder 108. On the upper and lower parts of the frame, shafts 109 and 110 respectively, are journaled in suitable bearings 111 and 112 as indicated. The shaft 109 carries pulleys 113 and 114 of which the former is of larger diameter. The shaft 110 mounts pulleys 115 and 116. Pulleys 114 and 116 are in register with the drive wheel 117 on the shaft 99, leading to the tail-stock structure. Normally the frame 101 is held in neutral position and both pulleys 114 and 116 are disconnected from the drive pulley 117. However, when the piston mechanism of cylinder 108 is forced outwardly, the frame 101 will be rocked to carry pulley 116 into frictional engagement with the pulley 117 and when the piston mechanism is drawn inwardly the frame will be rocked to carry pulley 114 into frictional engagement with the pulley 117, the connection of pulley 114 with pulley 117 resulting in movement of the tail-stock structure toward the head-stock structure, while engagement of pulley 116 with pulley 117 will result in movement in opposite direction of the tail-stock structure.

A main drive pulley 118 mounted on the main drive shaft 119 is connected by a belt 120 with the pulleys 113 and 115, this belt passing first about pulley 113 then about pulley 115 and then about a pulley 121 on a shaft 122 and then back to the main pulley 118. The pulley 113 being larger than pulley 115, the forward movement of the tail-stock structure will be at a lower speed than the rearward movement thereof. In order to lock the tail-stock structure in adjusted position, brake mechanism is provided for the pulley 117. As shown, a yoke

123 is supported at its upper end from a bracket extension 124 on bearing standard 104 (Fig. 3). Slidable longitudinally within this yoke frame and radially with reference to the pulley 117 is a brake block 125 having a slot 126 for receiving the shaft 102 which pivots the frame 101. The yoke frame 123 is thus stationary, and a spring 127 interposed between the head of the frame and the brake block tends to hold the brake block firmly against pulley 117. Mounted on the frame 101 is a cam block 128 having a notch 129 in its upper end for receiving the pin 130 extending from the brake block. When the frame 101 is in neutral position with its supported frictional pulleys free of the pulley 117, the pin 130 engages at the bottom of the notch 129 so that the brake block is firmly held against the pulley 117 to thus lock the tail-stock structure. However, when the frame 101 is rocked in either direction the inclined surfaces on the cam block will cooperate with the pin 130 to raise the brake block from the pulley 117 so that this pulley can be driven by the friction pulley when brought into engagement therewith. The brake mechanism is thus automatically released upon engagement of either friction pulley with the pulley 117.

The tail stock spindle 131 is mounted in a suitable manner and particularly to resist the end thrust and at its inner end carries projections 139 for entering the end of the log to securely hold it.

Suitable means for receiving a log and for raising it into position to be engaged by the head-stock clutch jaws and by the tail-stock spindle are best shown in Figs. 1, 3, 4, and 5. Pivoted at opposite sides of the head-stock structure foundation frame are levers 140 and 141 supporting at their inner ends a cross bar 142. The rear end of lever 140 connects with one end of a piston rod 143 of the cylinder 144 stationarily mounted. The other end of the piston rod connects with one end of a rock lever 145, whose other end is connected by the link 146 with one end of a rock lever 147 whose other end connects with the outer end of link 148 whose inner end connects to the outer end of the lever 141 (Figs. 1 and 3). With this cylinder and lever arrangement the levers 140 and 141 can be simultaneously rotated to raise or lower the log supporting bar 142. Similar mechanism may be provided for controlling a bar 149 for supporting the end of logs adjacent the tail-stock spindle and this controlling mechanism is preferably carried bodily by the tail-stock structure as indicated in Fig. 4. As shown to the left of Fig. 7, a suitable chute or runway 150 is provided for logs whose escape therefrom is controlled by suitable escapement mechanism 151. When a log is to be inserted in a machine, the bars 142 and 149 are raised to receive the log from the chute and after the log has been firmly secured between the head and tail stocks, the supporting bars are lowered so as not to interfere with the rotation of the log by the head stock structure.

The bark removing mechanism is bodily movable parallel to the log, but the log has no longitudinal movement. The various bark removing appliances are mounted on a table 152 having supporting wheel structures 153 for engaging rails 154 mounted on the machine foundation frame. Extending upwardly from this table adjacent the front edge thereof are sets of lugs 155 and 156, each set offering bearing support for a knife supporting beam 157. As shown, the lugs 155 support a bearing pin 158 for the main knife supporting frame, while the lugs 156 support the pin 159 for pivoting the end of a brace extension 160 from the main frame. There may be any number of such knife supporting structures and the rear end of each structure is weighted as indicated so that the edge on the vertically disposed knife 161 secured to the front of the structure will be held up against and forced through the bark on the log supported by the machine. Each knife blade is set to be at an angle with the log axis so that as the knife mechanism supporting table 152 travels, the various knives will cut the bark along helical lines. The rate of travel of the table is so adjusted with reference to the pitch of the helical cut that lateral thrust will be exerted by the knives against the severed strips of bark so that after cutting through of the bark by the knives, it will be forced laterally from the log body. The knives being placed below the log and forced upwardly by the weights, will cut through the bark and their pressure will tend to neutralize the bearing pressure on the head-stocks due to the weight of the log. In order to prevent the knives from cutting farther into the log than the thickness of the bark, gage mechanism is provided for each knife and such gage mechanism may be similar to that disclosed in my co-pending application, Serial No. 685,016, filed March 20, 1912. Provision is made so that simultaneous adjustment can be made of the gage mechanisms for all the knives. As best shown in Fig. 7, each gage plate 162 has diagonal slots for receiving studs 164 on the knife structure and the end of each plate connects with one arm of a bell crank lever 165 pivoted to the knife supporting structure. The other arm of each bell crank lever forks about a slide shaft or rod 166 between collars 167 secured to the shaft. The various pins 158 and 159 for the knife supporting levers are hollow and the shaft 166 is slidable therethrough. Upon sliding

of the shaft the various bell crank levers 165 are simultaneously rotated and simultaneous adjustment of the gage plates effected. Any suitable means 168 may be provided for controlling the shifting of the shaft 166 so that adjustment can be made while the machine is in operation and in accordance with the various thicknesses of the bark.

The mechanism for controlling the reciprocation of the knife mechanism supporting table is best shown in Fig. 1. The rod 169 extends from the table and terminates in a thrust bearing frame 170. On the foundation frame 20 for the head-stock structure a block 171 is secured, forming a bearing for a screw shaft 172 whose inner end has bearing in the thrust bearing frame 170. This shaft is slidable through and has bearing in standards 173 and 174, and on the shaft between these standards is the gear 175 having a key for engaging in the longitudinal key-way 176 in shaft 172 so that upon turning of this gear the shaft will be turned, and on account of its screw engagement with block 171 the shaft will move inwardly or outwardly as the case may be to move the knife mechanism supporting table on its track. The standards 173 and 174 also journal a shaft 177 and on this shaft between the standards is a pinion 178 meshing with the gear 175. The outer end of the shaft supports the cone pulley 179 and is further supported in a bearing standard 180. In front of the shaft 177, a counter shaft 181 is journaled in suitable bearings 182 and at its inner end carries a cone pulley 183 to be connected by belt 183′ with the cone pulley 179. Between the bearing 182 the shaft loosely carries forward and reverse pulleys 121 and 121′ adapted for alternate driving connection with the shaft by a clutch head 184 keyed to the shaft and slidable thereon. The pulley 121 is the one which has already been referred to and which, as shown in Fig. 6, is looped about by the belt which drives the friction pinions for the tail-stock adjusting mechanism. The pulley 121′ is connected by reverse belt 185 with another pulley on the main drive shaft 119 (Fig. 6). Forward and reverse belts 186 and 187 connect pulleys on this main drive shaft with the pulleys 30 and 31 for controlling the rotation of the head-stock clutch supporting frame (Figs. 1 and 3). Scraper chains may also be provided for removing the rough bark in advance of the knives. This chain mechanism is shown in Figs. 1, 2, and 7. Each knife supporting lever structure 157 pivots at its front end a sprocket wheel 188 and on the pivot pin of each lever is another sprocket wheel 189. Directly in front of the sprocket wheel on each lever structure is an idler sprocket wheel 190 and below the sprocket wheel 189 and pivoted on the table structure 152 is a second idler wheel 191, the idler 190 engaging below the top leg of the chain C and the idler 191 engaging below the lower leg of the chain. The rear end of each chain loops about the sprocket wheel 192 mounted on a shaft section 193 journaled in suitable bearing brackets 194 and secured to the rear side of the table structure. As shown in Figs. 1 and 2, each shaft section 193 accommodates two adjacent chains and between its bearings has a drive pulley 195 connected by belt 196 with a driving drum section 197. These various drum sections are all mounted on a common shaft 198 journaled in bearings 199, the drive pulley 200 on this shaft being connected by a belt 201 with a pulley on the main drive shaft 119 (Fig. 6). As the knife mechanism supporting table structure is reciprocated, the various belts 196 will travel along the driving pulley sections and the chains will be driven. These chains are provided with suitable scraping prongs or teeth 202 which engage with the bark at the under side of the log to scrape off the rough bark in advance of the knives.

When a log is to be inserted in the machine or a finished log is to be removed therefrom, the knives and chains should be moved out of the way. I therefore provide mechanism, best shown in Fig. 7, for effecting simultaneous swing of the knife mechanism supporting levers, a suitable cable being connected with the end of each lever structure 157 and passing over suitable pulley mechanism 203. Upon pull on these cables the rear ends of the lever structures will be raised and the front ends with the knives thereon will be lowered away from the log, this abnormal position being shown in dotted lines in Fig. 7.

As the tail structure is to be shifted back and forth to accommodate logs of different lengths I also provide means for preventing interference between the tail-stock structure and the various knife supporting lever structures. As shown in Figs. 2 and 7, a bell crank lever 204 is pivoted at its elbow to the table structure 152 adjacent each lever structure 157, the rear arm of the bell crank lever being connected with one end of a link 205 whose other end is pivoted to the lever structure to the rear of its pivot. The front arm of each bell crank lever carries at its end a roller 206 for coöperating with a cam rail 207 supported from the tail-stock structure. When the tail-stock structure is moved toward the head-stock or when any of the lever structures 157 reach the inner end of the tail-stock structure, the roller 206 will engage the under side of the cam rail and the bell crank lever 204 and the link 205 will rotate the lever structure and will move its front end into substantially vertical position so that it will not interfere in any way with

the head-stock structure. Upon such swing of the lever structure, the front section of the scraping chain will hinge about its sprocket wheel 189 and its idler 191, as indicated by dotted lines in Fig. 7.

After a log has had its bark removed, the supporting bars 142 and 149 are raised into position to receive the log, the clutch jaws on the head-stock structure are opened, and the tail-stock is removed, the released log being then received by the supporting bars. The supporting bars are then lowered to deposit the log onto inclined supporting platforms 208 down which it will roll to be received on a carrier trough 209 to be carried away from the machine. It will be noted that when the log is received on the raised cross bars 142 and 149 and the cross bars are then lowered, the log in addition to being lowered will be given a longitudinal movement so that it will be removed from the clutch jaws before being deposited on the receiving platform. Likewise when the log is applied to the lowered supporting bars preparatory to being inserted in the machine, it will be raised and at the same time moved longitudinally to carry its end into the clutch jaws when the supporting bars are caused to move upwardly. The bark that is scraped and cut from the log falls down and is received on conveyer mechanism 210 to be delivered at any desired place.

The extent of reciprocation of the bark removing mechanism supporting table in either direction is equal substantially to the length of the drum sections 197, each knife and associated chain traveling over the section of the log and entirely removing the bark from these adjacent sections. The cutting and scraping mechanisms will be effective during both directions of travel of the supporting table when the knives and chains are carried bodily in one direction in engagement with the log the log is rotated in corresponding direction, while if the movement of the knives and chains is in the opposite direction, the rotation of the log must be reversed. One log can therefore be de-barked when the knife and chain mechanism supporting table travels in one direction, and the next log will be de-barked during the return movement of the table and no time will be lost.

I thus provide a de-barking machine of simple and efficient construction in which logs can be accurately and automatically centered, and from which logs the bark will be readily and efficiently removed with minimum distance of travel of the cutting knives. There will be no waste of time as the machine will operate in both directions, *i. e.*, the knives will remove bark from the logs in either direction of travel of the knife structure supporting table. The knives being disposed to press against the under side of the log, the weight of the log on this supporting and driving structure will be in great part neutralized.

I do not, of course, desire to be limited to the exact construction and arrangement and operation described as changes and modifications can be made which would still come within the scope of the invention and I therefore claim the following:

1. In a bark removing machine, the combination of means for supporting a log for axial rotation, a plurality of bark removing knives, pivoted supporting frames for said knives, and means for causing said frames to press said knives against the under side of said log to relieve the log supporting means of part of the weight of the log.

2. In a bark removing machine, the combination of means for supporting the log for axial rotation, a plurality of bark removing knives below said log and disposed at an angle with reference to the log axis, individual supporting frames for said knives, said frames being weighted to cause pressure of the knives against the log whereby the log supporting means is relieved of part of the log weight.

3. In a bark removing machine, the combination of means for supporting a log and for causing axial rotation, a table adapted to be reciprocated longitudinally of the log, a plurality of knife supporting arms pivoted to said table and extending therefrom, a knife supported on each arm and engaging with the under side of the log, means for causing said knives to be forced against the log and through the bark thereon, said knives being set at an angle with the log axis, and means for causing said table to move at such speed with relation to the peripheral travel of the log that said knives will exert lateral pressure against the bark cut thereby.

4. In a bark removing machine, the combination of a head-stock and a tail-stock for supporting a log for axial rotation, said head-stock being stationary and said tail-stock being movable for the accommodation of logs of different length, a plurality of knife supporting arms each supporting a knife for engagement with the under side of the log, and means controlled upon movement of the tail-stock for causing removal of the knife arms from the path of said tail-stock.

5. In a bark removing machine, the combination of a head-stock and a tail-stock for supporting a log for axial rotation, said head-stock being stationary and said tail-stock being movable for the accommodation of logs of different length, a plurality of knife supporting arms each supporting a knife for engagement with the under side of the log, a cam roller carried by each knife supporting arm, and a cam rail carried by

said tail-stock, said cam rail coöperating with said cam roller upon movement of the tail-stock to move said arms out of the path of said tail stock.

6. In a bark removing machine, the combination of means for supporting a log for axial rotation, a supporting frame and means for reciprocating said frame parallelly with the log, a lever pivoted to said frame, a knife carried at one end of said lever and the other end of the lever being weighted to cause said knife to be pressed upwardly against the under side of the log.

7. In a bark removing machine, the combination of means for supporting a log for axial rotation, a supporting frame and means for reciprocating said frame parallelly with the log, a lever pivoted to said frame, a knife carried at one end of said lever and the other end of the lever being weighted to cause said knife to be pressed upwardly against the under side of the log, and means for adjusting for the depth of cut of said knife during running of the machine.

8. In a bark removing machine, the combination of means for supporting a log for axial rotation, a table and means for reciprocating said table along a path parallel with the log, a plurality of knife adjusting frames pivoted to said table, a knife carried at one end of each frame and the other end of said frames being weighted so that the knives will be forced against the under side of said log, and means for simultaneously adjusting for the depth of cut by said knives while the machine is operating.

9. In a bark removing machine, the combination of a head-stock and a tail-stock for supporting a log and for causing axial rotation thereof, a table and means for moving same parallel with the log axis, a plurality of frames pivoted on said table, a knife carried by the outer end of each frame and the other end of each frame being weighted whereby said knives are all pressed against the under side of said log to cut the bark therefrom during rotation of the log, a cam arm connected with each frame and a cam rail for engaging with the cam arms as the knife supporting frames are carried toward the tail-stock whereby said frames are swung to clear the tail-stock.

10. In a bark removing machine, the combination of a head-stock and a tail-stock for receiving a log, a table adjacent said log, driving means for causing rotation of said head-stock and at the same time causing travel of said table parallel with the log, a frame pivoted on said table, a knife supported at the outer end of said frame and set at an angle with reference to the log axis, the other end of said frame being weighted for yieldingly forcing said knife against said log, and means for adjusting for the depth of cut of said knife during operation of the machine.

In witness whereof, I hereunto subscribe my name, this 10th day of June, A. D. 1912.

TRACY W. SIMPSON.

Witnesses:
C. E. CONVERSE,
C. J. SCHMIDT.