J. E. MITCHELL & D. PARKS.

LOG CUTTING MACHINE.

APPLICATION FILED OCT. 4, 1916.

1,252,137.

Patented Jan. 1, 1918.

6 SHEETS—SHEET 1.

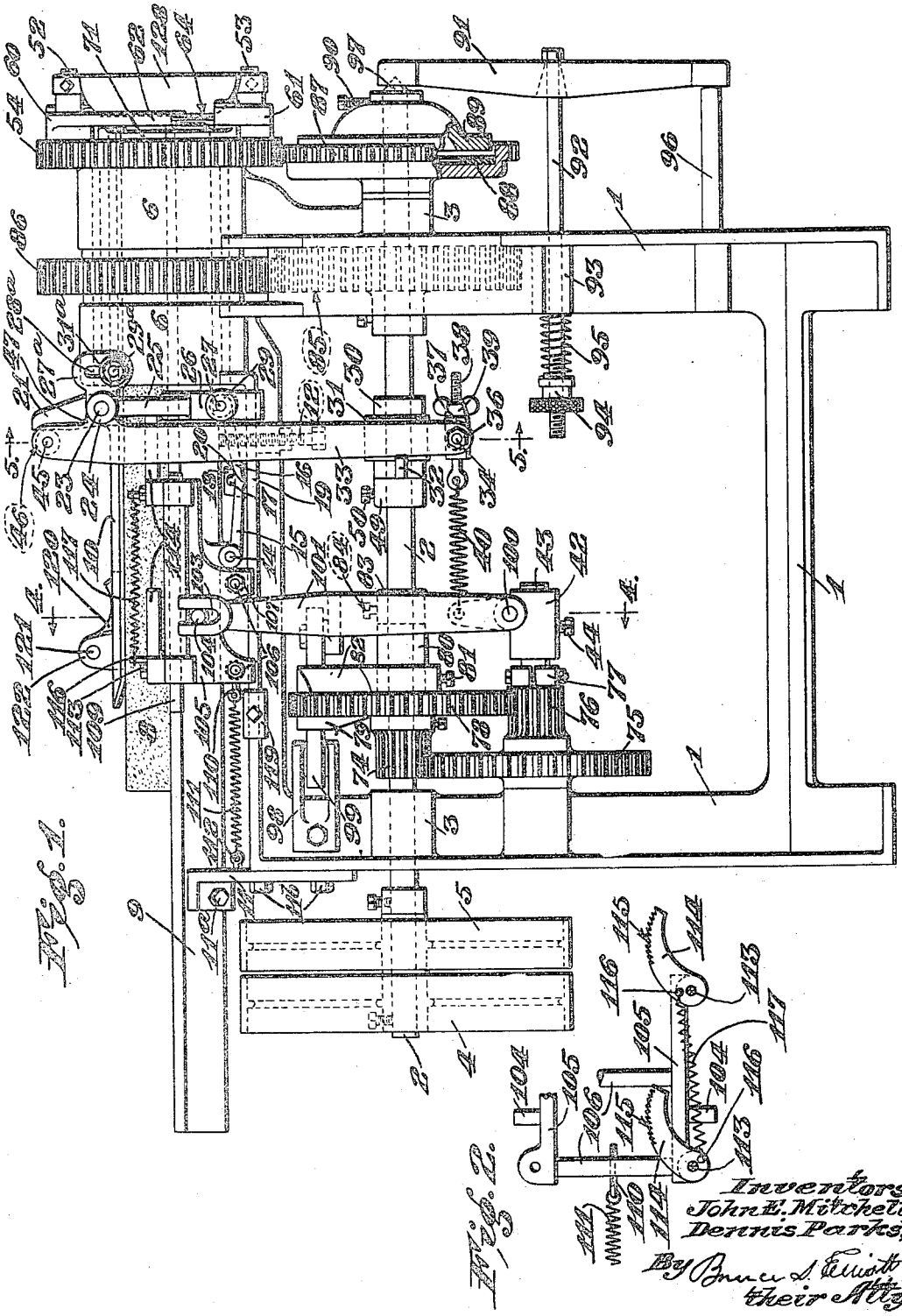


Fig. 1.

Fig. 2.

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6 SHEETS—SHEET 2.

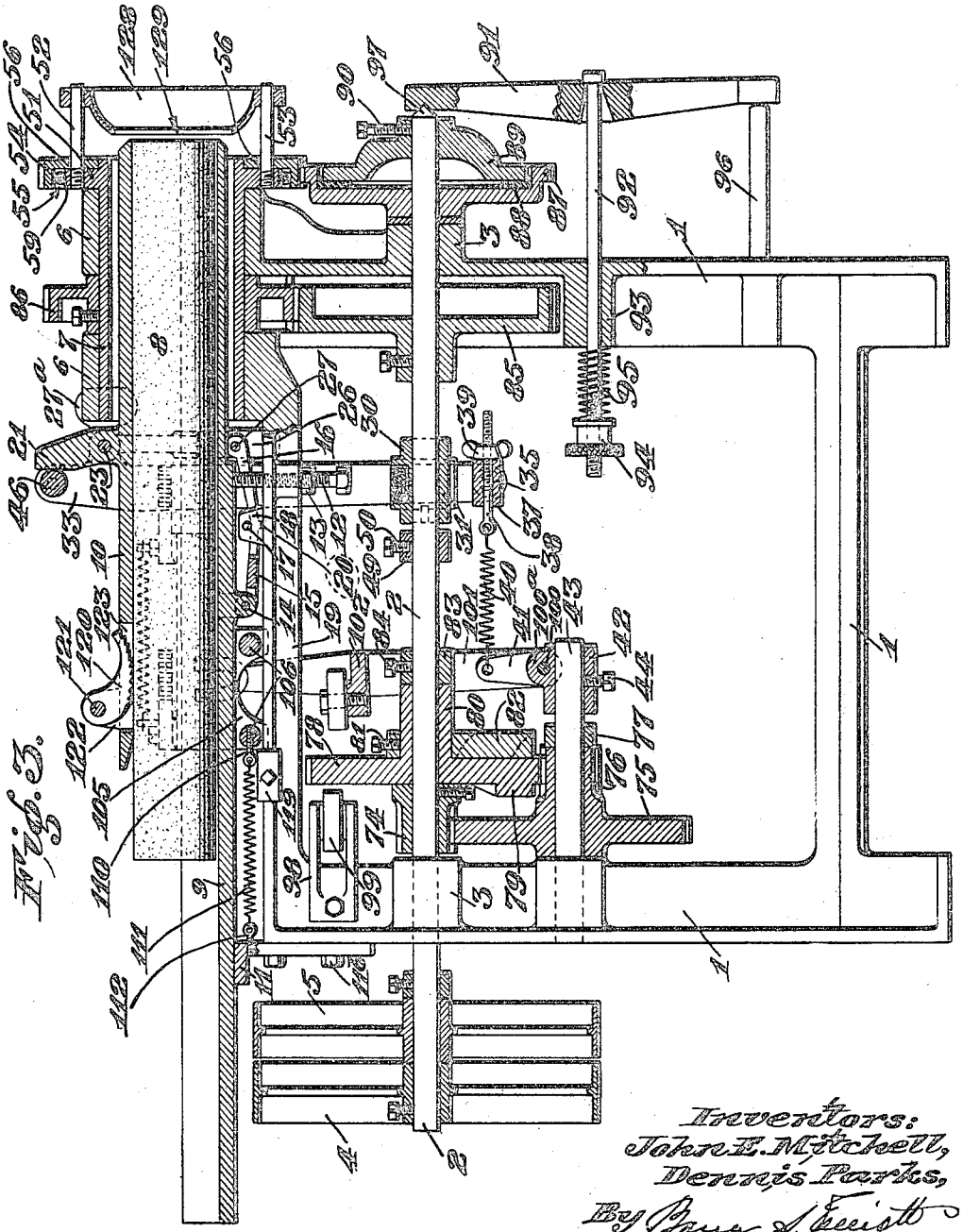


Fig. 3.

Inventors:
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LOG CUTTING MACHINE.

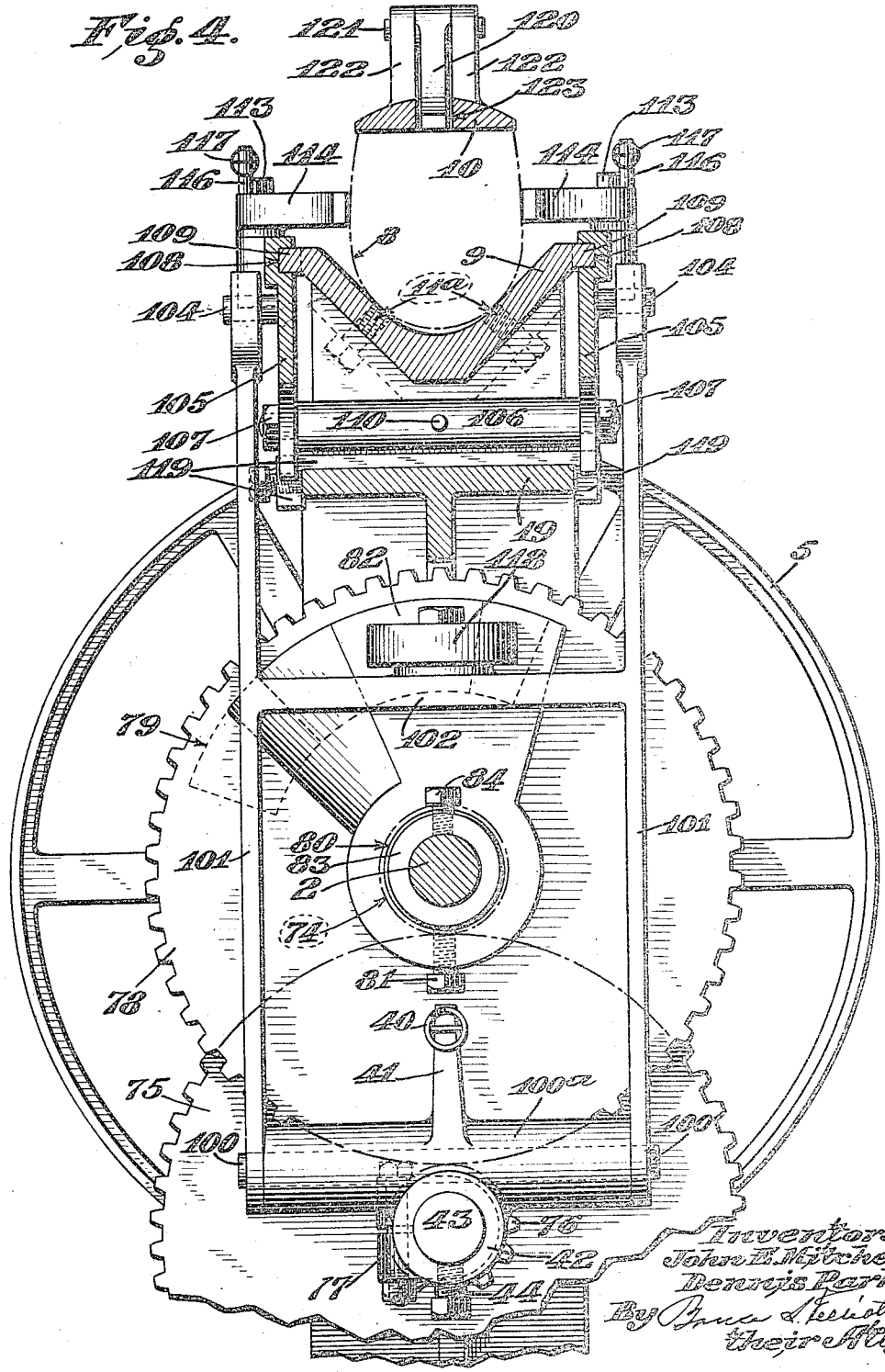
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6 SHEETS—SHEET 3.

Fig. 4.



Inventors:
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LOG CUTTING MACHINE.

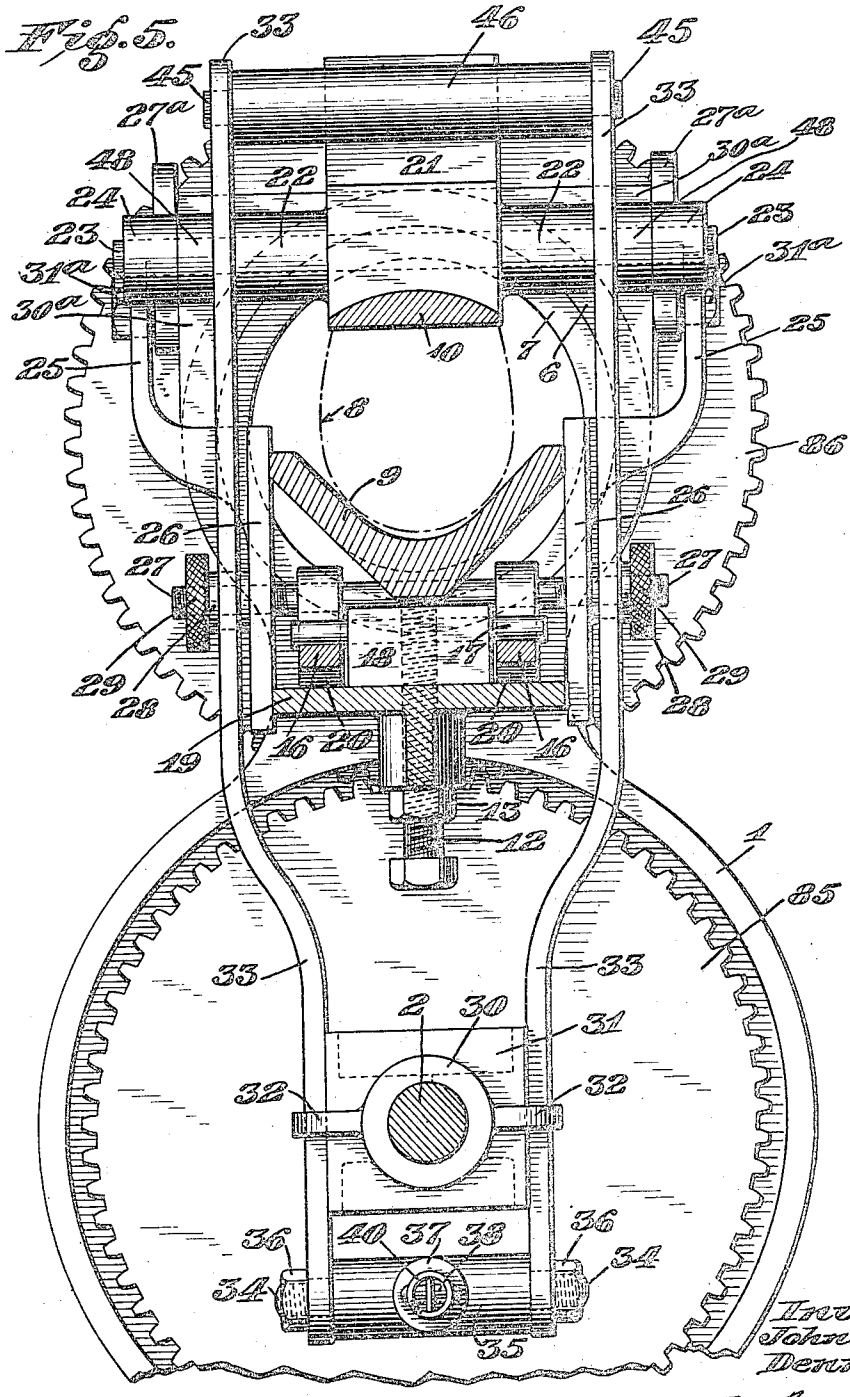
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6 SHEETS—SHEET 4.

Fig. 5.



Inventors:
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LOG CUTTING MACHINE.

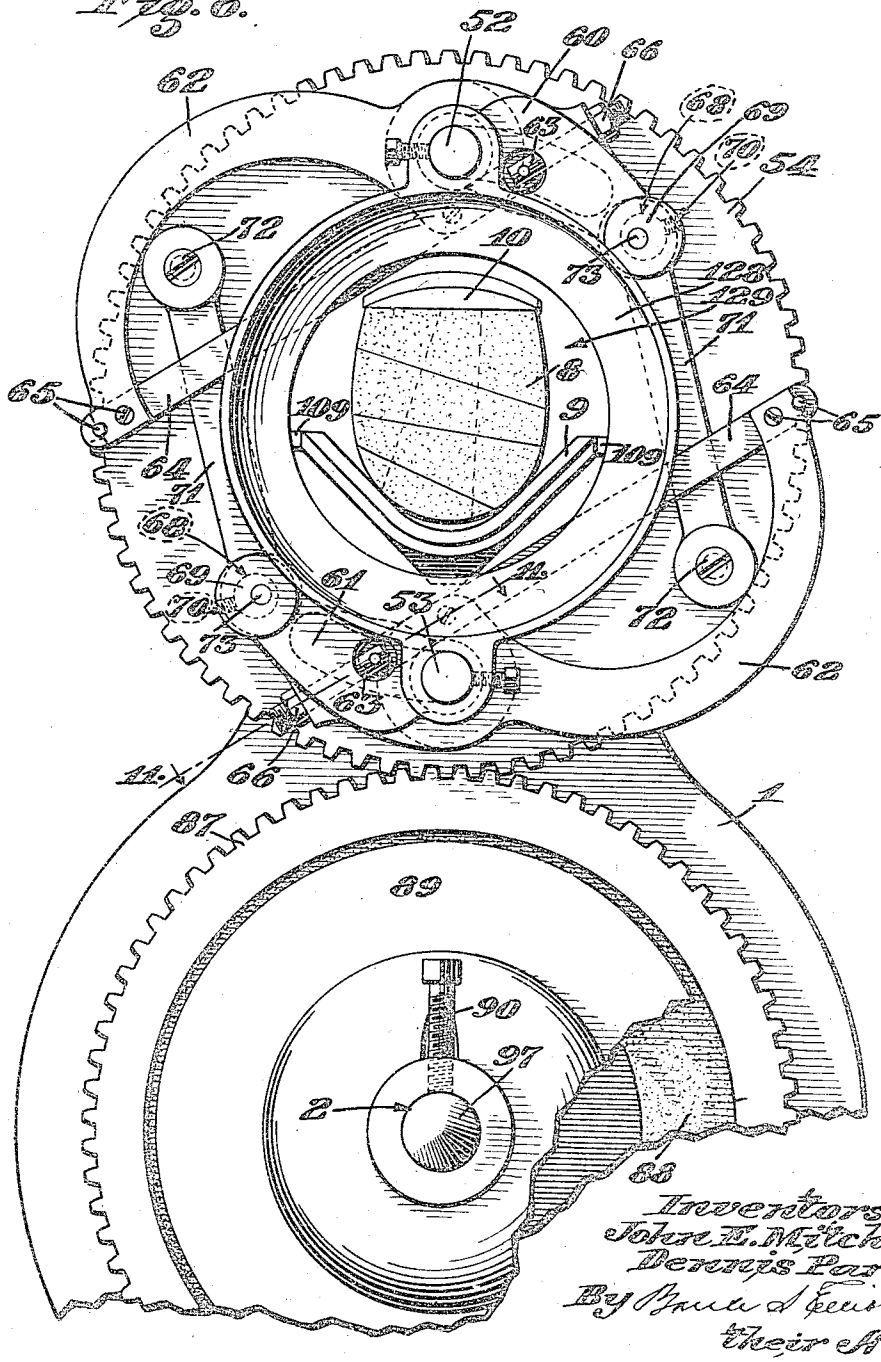
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6 SHEETS—SHEET 5.

Fig. 6.



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LOG CUTTING MACHINE.

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6 SHEETS—SHEET 6.

Fig. 7.

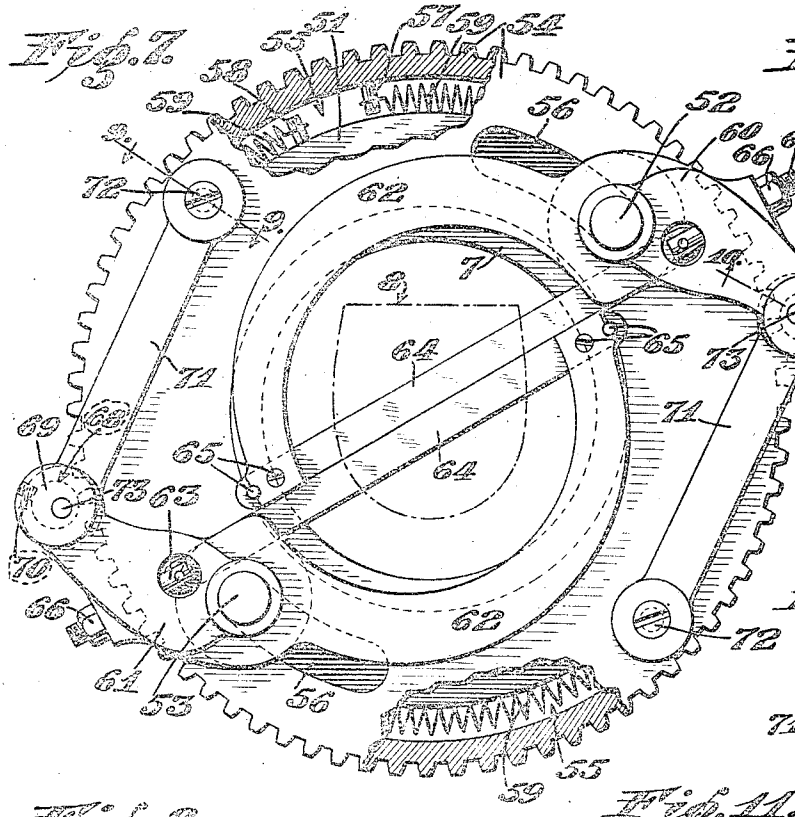


Fig. 9.

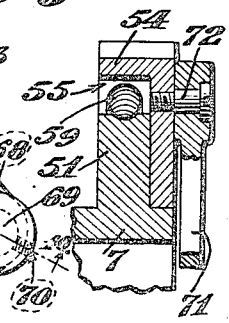


Fig. 10.

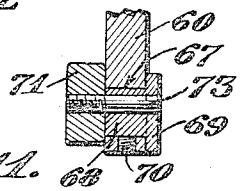


Fig. 8.

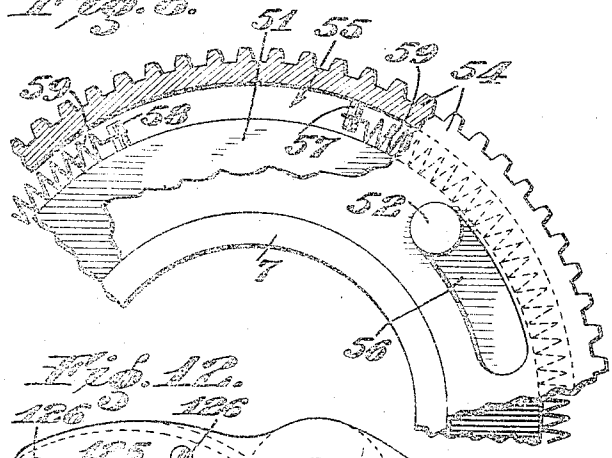


Fig. 11.

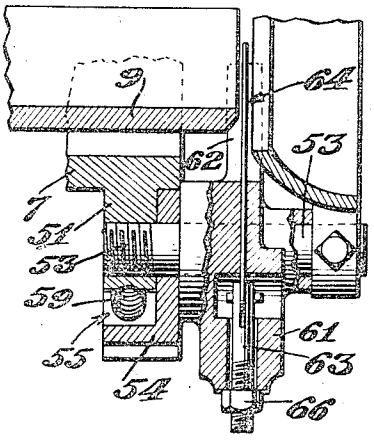
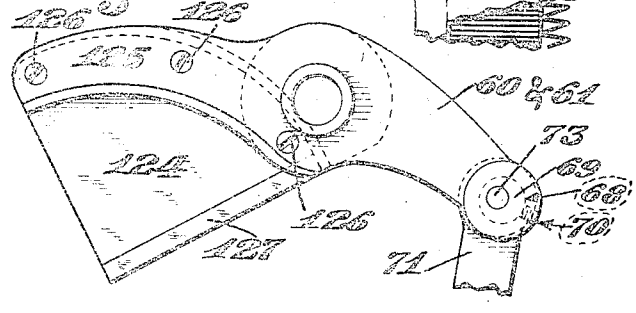


Fig. 12.



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UNITED STATES PATENT OFFICE.

JOHN E. MITCHELL AND DENNIS PARKS, OF ST. LOUIS, MISSOURI.

LOG-CUTTING MACHINE.

1,252,137. Specification of Letters Patent. Patented Jan. 1, 1918.

Application filed October 4, 1916. Serial No. 123,618.

To all whom it may concern:

Be it known that we, JOHN E. MITCHELL and DENNIS PARKS, citizens of the United States, residing in the city of St. Louis and State of Missouri, have invented new and useful Improvements in Log-Cutting Machines, of which the following is a specification.

This invention relates to the art of heel building, and has for its general object to provide a novel machine whereby so-called "logs" may be readily cut into sections of heel-blank size in a rapid manner and without waste of material.

Stated more in detail, the invention has for its salient objects to provide means for circumferentially and progressively cutting sections from a stationary log; to provide means for actuating a cutter whereby it is rotated about a log and simultaneously moved inward toward the axis thereof, and after penetrating the log to the plane of the axis is automatically withdrawn beyond the periphery of the log; to provide novel means for automatically advancing the log a predetermined distance after the cutter has removed a section therefrom and been withdrawn; and to provide novel means for automatically clamping the log while being cut, and to release said log to permit it to be fed forward.

Further objects of the invention relate to novel constructions, combinations and operations of parts whereby the above objects are attained.

Heretofore in separating heel-blank sections from logs, it has been the uniform custom to rotate the log and to advance a rotary saw toward the axis of the log and in a plane at right angles thereto. The use of a saw in severing the sections from the log necessarily entails a considerable waste of material due to the formation of saw dust. Moreover, as the circular saw can only be secured in its central portion, a relatively thick saw disk must be used to prevent bending and insure, as near as may be, a straight cut. To prevent the excessive waste from saw dust which would result from having the saw of uniform thickness throughout, the outer side of the saw is provided with a beveled marginal face to form a thin cutting edge. This results in forming a relatively wide V-shaped kerf in cutting and producing a central elevation on the side of the section cut off adjacent the beveled side of the saw. These objections are overcome in the present invention by the use of a knife-edge cutter, which produces no saw dust whatever; and which, being relatively stationary, *i. e.*, rigid in its holder, can be so mounted as to permit a relatively thin blade being employed without danger of the blade bending in operation. Furthermore, as it is practically impossible to sever sections from a leather log that will be available for use as heel-blanks except by means of a circumferential kerf or cut, the necessity heretofore existing for rotating the log to accomplish this operation has required the employment of a rotary holder for the log. Mechanism for rotating this holder is required in addition to that employed for rotating the saw; and as means are mounted on the log holder for clamping the log, and for automatically releasing it when the log is to be fed forward, requiring the coördination of actuating mechanism with the rotary log holder to accomplish the clamp and release of the log, the net result is a machine quite costly in construction, operation and upkeep as compared with the present machine. This is due to the fact that in this latter no rotation of the log is required; all rotatable parts are mounted on or driven from a single drive-shaft; the transverse movement of the cutter is effected by the mechanism which causes its rotation about the log; and, finally, whereas the rotary saw now in general use in this connection rapidly dulls and must be frequently replaced, the knife-edge cutter employed in the present machine may be used a very long time before becoming dull, and when this occurs, it may be removed and sharpened in a few minutes.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the complete machine, a portion being shown in section;

Fig. 2 is a fragmentary view illustrating part of the feeding mechanism;

Fig. 3 is a vertical longitudinal sectional view, the cutters being omitted;

Fig. 4 is a sectional view, on an enlarged scale, approximately on the line 4—4 of Fig. 1;

Fig. 5 is a similar view on the line 5—5 of Fig. 1;

Fig. 6 is a view in front elevation of the upper portion of the machine, the cutters being shown separated;

Fig. 7 is a detail view, partly in front elevation and partly in section, of the cutter head, the guard being removed and the cutters being shown in their closed relation;

Fig. 8 is a fragmentary sectional view of the cutter head showing the position of the parts corresponding to those illustrated in Fig. 6;

Fig. 9 is a fragmentary section on the line 9—9 of Fig. 7;

Fig. 10 is a similar view on the line 10—10 of Fig. 7;

Fig. 11 is a fragmentary section on the line 11—11 of Fig. 6; and

Fig. 12 is a view illustrating a modification of the cutters.

Referring now to the drawings, the numeral 1 indicates, generally, the frame of the machine, in which a drive shaft 2 is mounted in bearings 3. Mounted on one end of the drive shaft is a fast pulley 4 and a loose pulley 5. The shaft 2 is driven from the pulley 4 by an ordinary drive belt (not shown). On its upper side, and at the right-hand end, as shown in Figs. 1 and 3, the frame 1 is provided with two cylindrical bearings 6, in which is rotatably mounted a sleeve 7. Mounted on the upper side of the frame 1 is a holder for a log, such as indicated at 8. This holder comprises a relatively long back-plate 9 which, as shown particularly in Figs. 5 and 6, is trough-shaped to conform somewhat to the rounded or back side of the log, and what may be termed a breast-plate 10, which is preferably considerably shorter than the back-plate 9, and is flat on its inner side to conform to the shape of the breast side of the log. The back-plate 9 supports the log which is to be operated upon, and is made of sufficient length to accommodate the longest log or log section which would ordinarily be used. The back-plate 9 is secured at the rear end of the frame 1 in a bracket 11 by means of screws 11^a and is raised somewhat above the upper side of the frame at this point. The bracket 11 is adjustable by means of slots (not shown) and screws 11^b. Toward its forward end said back-plate has its bottom resting on and supported by the upper end of an adjusting screw 12 which is secured in adjusted positions by a lock nut 13. Pivotally mounted at 14 in a lug provided on the under side of the back-plate 9, and about centrally of its length, is a bifurcated lever 15, each arm 16 of which passes under the ends of a pivot rod 17 mounted in a lug 18, which in turn is mounted on the upper side of a top frame member 19. On its under side each arm 16 is provided about centrally of its length with a downwardly-projecting lug 20 which rests upon the frame member 19 and upon which said arms are adapted to pivot or rock on said frame member. Extending upward from the breast-plate 10 of the holder is a projection 21. Extending from opposite sides of the projection 21 are bearings 22, see particularly Fig. 5, through which extends a pivot rod 23 (Figs. 1 and 3) on the outer ends of which are pivotally mounted, by means of integral bearings 24, the upper ends of a pair of arms 25, the lower portions of which afford vertically-extending members 26 which intermediate their ends are apertured to loosely receive the opposite ends of a pivot rod 27. This pivot rod also passes through the outer ends of the arms 16 of the bifurcated lever 15 previously referred to, so that said arms 16 with their rocking points 20 resting on the upper frame member 19 constitute, through the pivot rod 27, and the arms 25–26 and rod 23, an adjustable support for the upper or breast-plate 10 of the log holder. A further means of supporting the breast-plate 10 through the medium of the pivot rod 23 is provided by an ear 27^a having a vertically-disposed slot 28^a which receives a screw-threaded stud 29^a mounted on an upward extension 30^a of the machine (Figs. 1 and 5), which extension is integral with the innermost bearing 6 (Fig. 3) previously referred to. The stud 29^a is adapted to receive a binding nut 31^a. The pivot rod 23 is located slightly in advance of the center of the breast-plate 10 so that the rear end portion of the breast-plate tends to slightly overbalance the forward end portion. It will readily be seen, by an inspection of Figs. 3 and 5, that after the screws 11^b have been loosened and the adjusting screw 12 turned upward to elevate the under or back-plate 9 of the holder this action will result through the lever 15 in drawing the arms 25 and hence the breast-plate 10 downward, and, on the other hand, after the adjusting screw 12 is unscrewed to lower the forward portion of the back-plate 9, this operation will result in raising the arms 25 and hence the breast-plate 10. In this manner both plates of the holder may be simultaneously adjusted to accommodate the size of the log from which heel-blanks are to be cut. The vertical portions 26 of the arms 25 engage opposite side edges of the back-plate 9 and frame member 19, as shown by Fig. 5. The outer ends of the pivot rod 27 are screw-threaded, and loosely mounted on either end of this rod is a collar 28 and beyond each collar a thumb-nut 29 has screw-threaded engagement with the rod 27. When the adjusting screw 12 has been turned to adjust the plates 9 and 10 as previously described, the thumb-nuts 29 and binding nut 31^a, which, of course, had been loosened, are then turned to bind the vertical portions 26 of the arms 25 against

the side edges of the back-plate 9 and frame member 19 and the ear 27ª against the flat side of the frame projection 30ª, respectively, and thus firmly secure the said back-plate and the breast-plate 10 in their relative adjusted positions. The breast-plate 10, however, is still free to pivot on the rod 23 for the purpose of permitting the plate to clamp the log 8 from which sections are being cut, and the manner of clamping and releasing the log will now be described.

Slidably mounted on the shaft 2 is a sleeve bearing 30 which carries an integral rectangular block 31 (Fig. 5). On opposite sides of this block lugs 32 are provided in front of which extend lever arms 33. The lower ends of these lever arms are pivotally mounted on the outer reduced portions, or studs, 34 of a cross-bar 35, the said lugs 34 having outer screw-threaded ends for receiving nuts 36 whereby the lower ends of the lever arms are retained in position on said cross-bar. The cross-bar 35 also provides an integral extension 37 at its center, and extending at right angles thereto from the front and rear sides thereof, and in this extension 37 is mounted an eye bolt 38 which passes through the extension 37 and receives on its outer screw-threaded end a thumb-nut 39. Secured in the eye of the bolt 38 is one end of a coil spring 40, the opposite end of which is secured in the upper end of a lug 41 which is formed integral with a sleeve 42 adjustably secured on a stub shaft 43 by means of a binding screw 44. The upper ends of the lever arms 33 are pivotally mounted on the reduced end portions 45 of a cross bar 46 (Fig. 5) which normally engages the rear side of the lug 21. The forward side of each of the lever arms 33 near its upper end is provided with a projection 47 (Fig. 1) carrying a hub 48, said hubs being loosely mounted on the outer end portions of the pivot rod 23. The cross-bar 46 is normally held in engagement with the lug 21 by the spring 40 which normally tends to draw the lower ends of the lever arms 33 inward. In such position the forward portion of the breast-plate 10 will be pressed downward upon the forward portion of the log 8 to clamp said log between the breast-plate and the back-plate 9. Through mechanism to be described later, the main drive shaft 2 is at intervals given a longitudinal movement toward the forward end of the machines. When this occurs a collar 49 adjustably secured on said shaft by a binding screw 50 is brought into contact with the sleeve bearing 30, forcing the lower ends of the lever arms 33 outward or toward the front of the machine, and removing the cross-bar 46 from contact with the lug 21. When this occurs the rear portion of the breast-plate 10, which, as stated above, overbalances the forward portion, will tend to slightly raise the forward portion and release the clamp thereof upon the log and permit its being fed forward as later to be described. The movements of the breast-plate 10 just described are very slight, being scarcely discernible, but they are sufficient both to clamp the log and to release it for the feeding movement. The engagement of the breast-plate with the flat or breast side of the log, also prevents the latter from turning during the operation of cutting the log, hereinafter described.

The holder formed by the plates 9 and 10 projects through and slightly beyond the forward end of the sleeve 7 (Fig. 3) and the method of cutting sections from the log 8 will now be described.

Formed integral with the sleeve 7 (Figs. 3, 7 and 8) and located near the forward end thereof is an annular flange 51 in which are screwed or otherwise fixedly secured two studs 52, 53. Rotatably mounted on the extreme forward end of the sleeve 7 is a gear 54 which is recessed on its inner side to house the annular flange 51 but so as to leave an annular space 55 between the periphery of the flange and the inner circumference of the gear (Figs. 7 and 8). Said gear abuts against the front face of the annular flange 51 and is provided with curved slots 56 which receive and are adapted to work over the studs 52, 53, respectively. Mounted on the inner wall of the recess of the gear 54 is a stud 57, and mounted on the periphery of the flange 51 is a similar stud 58. Secured at its opposite ends to the respective studs 57 and 58 and extending around the flange 51 in the space 55 is a coil spring 59. Pivotally mounted on the studs 52, 53, and located on the outside of the face of the gear 54 are arms 60, 61, each of which is provided with a bow-shaped extension 62 and is apertured to receive a screw-threaded rod 63 in the inner end of which is secured one end of a cutting blade 64, the other end of which is secured in any suitable manner, as indicated at 65, in the outer end of the bow-shaped extension 62. A nut 66 has screw engagement with each of the rods 63, and by screwing up these nuts against the arms 61 and thereby forcing the rods 63 outward the proper tension can be produced on the cutting blades 64. Each of the arms 60, 61, has at its outer end an aperture 67 (Fig. 10) for receiving a cylindrical shank 68 of an adjustable bearing 69. A set screw 70 passing through the end of the arm 60 and engaging the shank 68 holds the bearing 69 in any position to which it may be turned in the aperture 67. The numeral 71 indicates an arm which is pivotally mounted at 72 (Fig. 9) at its outer end on the outer face of the gear 54 and near the periphery thereof, and has fixedly secured in its inner end a pin 73 which is rotatably mounted in the bearing 69 eccentri-

cally thereof. By loosening the screws 70 and turning the bearings 69 the pin 73 may be moved farther from or nearer to the pivot 72 to vary the throw of the arms 60 and 61 produced by the arms 71, as later described. Fixedly secured on the shaft 2 (Fig. 3) is a pinion 74 which is in mesh with a relatively large gear 75 loosely mounted on the stub shaft 43 before referred to. The gear 75 has a hub providing a pinion 76, and a collar 77 secured on the stub shaft and abutting against the end of the pinion 76 holds the gear in position on the stub shaft 43. Loosely mounted on the shaft 2 is a gear 78, the teeth of which are in mesh with the pinion 76. On its inner side the gear 78 is provided with a cam 79. On its opposite side the gear 78 is provided with an elongated hub 80 adjustably secured on which, by a set screw 81, is a cam 82. A collar 83, held by a set screw 84 on the shaft 2 and abutting against the end of the hub 80 maintains the gear wheel 78 in its proper position on the shaft. Fixedly secured on the shaft 2 toward the outer end thereof is a gear 85, the teeth of which are in mesh with the teeth of a gear 86 which is fixed on the sleeve 7. Loosely mounted on the shaft 2 beyond the bearing 3 is a gear 87 which is recessed on its outer face to provide a seat for a friction ring 88. The teeth of the gear 87 are in mesh with the teeth of the gear 54 heretofore described. The numeral 89 indicates a clutch member which is fixedly secured on the outer end of the shaft 2 as by a set screw 90. The numeral 91 indicates a lever which is pivotally mounted centrally of its length on the outer end of a rod 92 which is slidably mounted in a bearing 93 provided on the frame. The inner end of this rod is screw-threaded to receive an adjusting nut 94, and between the inner end of the bearing 3 and the adjusting nut is a coil spring 95. The numeral 96 indicates a stop against which the lower end of the lever 91 engages and which forms a pivot for said lever. The inner end of the shaft 2 is formed conical, as indicated at 97, to be received in a corresponding recess formed in the upper end of the lever 91. As heretofore stated, the shaft 2 is slidably mounted in its bearings 3, and the tension of the spring 95 is such as to force the shaft 92 inward so that the clutch member 89 will frictionally engage the friction ring 88 and thus cause the gear 87 to be rotated with the shaft 2. In order to bring the cutters from the open position shown in Fig. 6 to the closed position shown in Fig. 7 provision is made for a differential movement between the sets of gears 85 and 86 and 54 and 87, and this is accomplished by so proportioning the gears that the gear 54 will be driven at a slightly less rate of speed than the gear 86. This may be accomplished in various ways, but for convenience of illustration the gear 54 is shown to be of slightly larger diameter than the gear 86 and the gear 87 of slightly less diameter than the gear 54 or the gear 85. As a result, the gear 85 will cause the gear 86 and the annular flange 51 to travel at a certain rate of speed, while the gear 88 will cause the gear 54 to travel at a slower rate of speed than the annular flange 51, and thereby cause a lag in its movement. Thus, with the cutters 64 in the open position shown in Fig. 6, and the machine being in operation, the annular disk 51 moving faster than the gear 54 will cause the pins 52 and 53 to gradually move from the position in the end of the slots 56 which they are shown to occupy in Fig. 6, and as shown with respect to the pin 52 in Fig. 9, to the opposite ends of said slots, or to that position they are shown to occupy in Fig. 7. This movement causes the cutters to come together at the axis of the log, or at the center of the holder, due to the leverage effected by the arms 71 which are pivotally mounted on the gear 54, and the arms 60 and 61, which are pivotally mounted on the annular flange 51. In this movement the arms 60 and 71 turn upon each other on the eccentric pin 73 as a pivot. This relative movement between the annular flange 51 and the gear 54 also results in bringing the studs 57 and 58 from the widely-separated position they are shown to occupy in Fig. 8 to the relatively close position they are shown to occupy in Fig. 7, which movement is against the resistance of the spring 59 and results, of course, in its extension. It now remains to describe the manner in which the cutters 64 are again brought to the open position shown in Fig. 6.

Secured on the frame of the machine (Fig. 3) is a bracket arm 98 at the outer end of which is mounted a roller 99. This roller is adapted to be engaged by the cam 79 on the gear 78. When the studs 52 and 53 have reached the ends of the slots 56, or the positions they are shown to occupy in Fig. 7, the gear 54 and the annular disk 51 must necessarily travel at the same rate of speed. This continues, however, for only a short period of time to insure the completion of the cut, and during this period the clutch member 89 will slip slightly over the friction ring 88. The adjustment of the machine, however, is such that at about this time the cam 79 will engage the roller 99, and as the roller rides up on the cam the shaft 2 will be forced by the gear 78 to the right, as shown in Fig. 3, thereby moving the clutch member 89 out of engagement with the friction ring 88 against the resistance of the spring 95. As soon as the clutch member 89 is moved out of frictional engagement with the friction ring 88 the spring 59 is at once free to contract, with the result that it causes the disk 54 to be rotated

rapidly until the opposite ends of the slots from those shown to be engaged by the pins 52 and 53 in Fig. 7 will be moved into engagement with said pins, or to the position shown in Fig. 6 and Fig. 8. It will be noted that there is practically no resistance to this movement as the gear 87 is loosely mounted on the shaft 2, and the gear 54 is loosely mounted on the sleeve 7. The above operation occurs rapidly, and as soon as the cam 79 rides off of the roller 99 the spring 95 draws the lever 91 inward, again forcing the clutch member 89 into frictional engagement with the friction ring 88, and the preceding operations are repeated. Before this latter movement occurs, however, it is necessary to feed the work forward in order to present a fresh portion for the cutters to act upon. This is accomplished by the following mechanism, referring more particularly to Figs. 1, 3 and 4:

Pivotally mounted at its lower end on studs 100 provided at opposite ends of a cross-bar 100ª formed integral with the collar 42 is a yoke-frame comprising side bars 101 connected by a cross-bar 102. The upper end of each of the side bars is U-shaped providing an open end slot 103, and these slots engage over studs 104 mounted on opposite sides of a feeding carriage comprising side members 105 mounted on the reduced end portions of cross-bars 106, said reduced end portions being screw-threaded and receiving nuts 107. The upper ends of the side members 105 are shaped to provide rectangular recesses 108 which slidably engage flanges 109 provided on opposite sides of the lower or back-plate 9. The rear cross-bar 106 has mounted in it an eye bolt 110 to which is secured one end of a coil spring 111 the opposite end of which is secured in an an eye bolt 112 mounted on the bracket 11 which supports the back-plate 9. Pivotally mounted on studs 113 (Fig. 2) at either end of the side members 105 are dogs 114 having curved serrated edge portions 115 which extend over the opposite side edges of the back-plate 9 in a position to engage the opposite sides of the log 8. The dogs 114 have pins 116 projecting upwardly from their hubs above and below the pivot studs 113, respectively, and a spring 117 connects the pins 116 and tends normally to draw the serrated edges 115 inward into engagement with the sides of the log. Mounted on the cross-bar 102 is a roller 118 which is in the path of the cam 82 mounted on the hub 80 of the gear 78 heretofore described. The operation of the parts is so timed that as the cutters 64 are opened in the manner previously described the cam 82 will engage the roller 118 thereby moving the upper ends of the side bars 101 toward the front of the machine, which movement, through the engagement of said bars with the studs 104, moves the feeding carriage in a similar direction, and against the resistance of the spring 111. In this movement the dogs 114 being in engagement with the sides of the log are caused to bite into the same and to move it forward through the holder a distance equal to the length of the section to be severed from the end of the heel log. As soon as this feeding operation is completed the cam 82 rides off of the roller 118 and the spring 111 causes the return of the feeding carriage and yoke-frame to their original positions. A stop bar 119 is adjustably secured on the upper frame member 19 to limit the return movement of the said carriage, and to regulate the distance the side bars 101 shall move in the feeding operation. In order to prevent the dogs 114 from pulling the log back in their return movement a serrated dog 120 (Figs. 3 and 4) pivotally mounted on a rod 121 supported in lugs 122 extending upward from the breast-plate 10 is arranged to bear by gravity upon the log through a recess 123 in said breast-plate and to arrest any tendency to backward movement of said log.

The cutters 64 are mounted to rotate in close proximity to the end of the holder, as shown more clearly in Figs. 1, 6 and 11, and as they are continuously rotated about the log and have a movement toward each other, the result accomplished is that the end of the log projecting beyond the holder is severed by a circumferential and progressive cutting movement, the cut being completed when the edges of the knife are brought together as shown in Fig. 7.

In the modification illustrated in Fig. 12 a blade 124 is employed which is quadrant-shaped, and the arms 60 and 61 are provided with curved extensions 125, each of which is recessed on its under side to receive the curved edge portion of the blade which is provided with apertures and secured in position by means of screws 126. The opposing edge portions of these blades are beveled on their outer sides, as indicated at 127, and sharpened to a knife edge. For many reasons this form of cutter is preferred, as it can be secured in its holder in a very rigid manner, being braced around its entire outer periphery, and hence permits of a relatively thin blade being used. However, with either form of blade shown, it is possible to employ much thinner material than it has been found possible to use with the circular saws heretofore employed. It will furthermore be understood that while it is desirable for the sake of rapidity of operation to employ two opposing cutters as illustrated in the main figures of the drawings, such an arrangement is not essential to the satisfactory operation of the machine, as a single cutter of either type disclosed will sever sections from the log in as entirely satisfactory

a manner as two cutters, but not so rapidly.

It will now be seen that the dominating characteristic of the present invention is the provision of rotary knife-edged cutting members which operate to sever sections from the log by producing a progressive circumferential cut, as distinguished from a sawing action; and that this operation is performed while the log is stationary, thus simplifying the operation by dispensing with the necessity of providing the construction and mechanism necessary to enable the log holder to be rotated. The operation of cutting is very rapid, there is an utter absence of the production of saw dust, thus eliminating all waste, and the thinness of the blades which it is found possible to employ reduces to the minimum the distortion of the section of the log being cut off, such distortion being very considerable in the machine heretofore generally used, due to the production of a relatively wide kerf by the beveled edge of the relatively thick saw employed. The sections cut off by the present machine have practically straight sides and are in better condition for forming heels than where, as heretofore, they are somewhat concaved on one side and have a central projection, or convex surface, on the other.

In order to insure the discharge of the cut-off sections away from the machine, and to prevent the cut-off sections from being thrown laterally outward by centrifugal force, a cup-shaped guard 128 (Figs. 3 and 6) is mounted on the outer ends of the studs 52, 53, its inner end being open, as indicated at 129, and circular. The opening 129 is slightly larger than the diameter of the holder, as shown by Fig. 6, and lies in close proximity thereto so that as the log sections are cut off they will be compelled to fall away from the machine, and be prevented from being thrown outward laterally.

We claim:

1. In a machine of the class described, in combination with a relatively stationary log holder, a pivotally mounted cutter, means for rotating said cutter around a log held against longitudinal movement in said holder and for progressively turning the cutter about its pivot toward the axis of the log, and means for automatically withdrawing said cutter when its cutting edge has crossed the axis of the log.

2. In a machine of the class described, in combination with a log holder, an arm pivotally mounted intermediate its ends and carrying a cutter, driving mechanism for rotating said arm around a log held against longitudinal movement in said holder and simultaneously turning the arm about its pivot to move the cutter inward, or toward the axis of the log, and automatic means cooperating with said driving mechanism to turn the arm outward and withdraw the cutter after its cutting edge has passed the axis of the log.

3. In a machine of the class described, a log holder, a pair of rotatable members movable in a plane at right angles to the axis of said holder, an arm pivotally mounted intermediate its ends on one of said members, actuating mechanism operatively connecting one end of said arm with the other rotatable member, and means for driving said rotatable members at different rates of speed whereby said mechanism will be caused to move the free end portion of said arm inward on arcual lines to carry the cutter toward the axis of said holder.

4. In a machine of the class described, a log holder, a pair of rotatable members movable in a plane at right angles to the axis of said holder, an arm pivotally mounted intermediate its ends on one of said members, lever mechanism pivotally connecting one end of said arm with the other rotatable member, a cutter carried by the free end portion of said arm, and means for driving said rotatable members at different rates of speed whereby said lever mechanism will cause the movement of the free end portion of said arm inward on arcual lines to carry the cutter toward the axis of said holder.

5. In a machine of the class described, a log holder, a pair of rotatable members movable in a plane at right angles to the axis of the holder, a cutter pivotally mounted on one of said members, actuating mechanism operatively connecting said cutter with the other member, means for simultaneously driving said members at different rates of speed whereby said mechanism will be caused to move said cutter toward the axis of said holder, and means for accelerating the movement of the slower moving member to cause said mechanism to restore the cutter to its normal position.

6. In a machine of the class described, a log holder, a pair of rotatable members movable in the same direction in a plane at right angles to the axis of the holder, a cutter pivotally mounted on one of said members, lever mechanism pivotally connecting said cutter with the other member, means for simultaneously driving said members at different rates of speed whereby said lever mechanism will cause the movement of said cutter toward the axis of said holder, and means for accelerating the movement of the slower moving member to cause said lever mechanism to restore the cutter to its normal position.

7. In a machine of the class described, a log holder, a pair of rotatable members movable in the same direction in a plane at right angles to the axis of said holder, a cutter pivotally mounted on one of said members, actuating mechanism operatively

connecting said cutter with the other of said members, means for simultaneously driving said members at different rates of speed whereby said mechanism will cause the movement of said cutter toward the axis of said holder, means for releasing the driving mechanism from engagement with one of said rotatable members, and automatic means for accelerating the movement of the slower moving member to cause said mechanism to restore the cutter to normal position.

8. In a machine of the class described, a log holder, a pair of rotatable members movable in the same direction in a plane at right angles to the axis of said holder, a cutter pivotally mounted on one of said members, lever mechanism pivotally connecting said cutter with the other of said members, means for simultaneously driving said members at different rates of speed whereby said lever mechanism will cause the movement of said cutter toward the axis of said holder, means for releasing the driving mechanism from engagement with one of said rotatable members, and automatic means for accelerating the movement of the slower moving member to cause the lever mechanism to restore the cutter to normal position.

9. In a machine of the class described, a log holder, a pair of rotatable members movable in the same direction in a plane at right angles to the axis of the holder, a cutter pivotally mounted on one of said members, actuating mechanism operatively connecting said cutter with the other of said members, driving mechanism operating to simultaneously rotate said members at different rates of speed, whereby said mechanism will cause the movement of said cutter toward the axis of said holder, means operated by the machine for automatically releasing the driving mechanism from engagement with one of said rotatable members, and automatic means operating, upon the release of said driving mechanism, to accelerate the movement of said slower moving member to cause said mechanism to restore the cutter to normal position.

10. In a machine of the class described, a log holder, a pair of rotatable members movable in a plane at right angles to the axis of said holder, a cutter pivotally mounted on one of said members, actuating mechanism operatively connecting said cutter with the other rotatable member, means for driving said rotatable members at different rates of speed whereby said mechanism will be caused to move said cutter toward the axis of said holder, a tension device resisting the differential movement between said rotatable members, and means for disengaging the driving means from one of said rotatable members whereby said tension device will advance the slower moving member and restore the cutter to normal position.

11. In a machine of the class described, a log holder, a pair of rotatable members movable in the same direction in a plane at right angles to the axis of the holder, a cutter pivotally mounted on one of said members, lever mechanism pivotally connecting said cutter with the other of said members, driving mechanism operating to simultaneously rotate said members at different rates of speed, whereby said lever mechanism will cause the movement of said cutter toward the axis of said holder, means operated by the machine for automatically releasing the driving mechanism from engagement with one of said rotatable members, and automatic means operating, upon the release of said driving mechanism, to accelerate the movement of said slower moving member to cause said lever mechanism to restore the cutter to normal position.

12. In a machine of the class described, a log holder, a pair of rotatable members movable in a plane at right angles to the axis of said holder, a cutter pivotally mounted on one of said members, lever mechanism pivotally connecting said cutter with the other of said members, means for driving said members simultaneously at different rates of speed whereby said lever mechanism will cause the movement of said cutter toward the axis of said holder, a tension device resisting the differential movement between said rotatable members, and means for disengaging the driving means from one of said rotatable members whereby said tension device will advance the slower moving member and restore the cutter to normal position.

13. In a machine of the class described, a log holder, a pair of rotatable members movable in the same direction in a plane at right angles to the axis of said holder, a cutter pivotally mounted on one of said members, actuating mechanism operatively connecting said cutter with the other of said members, means for simultaneously driving said members at different rates of speed whereby said mechanism will cause the movement of said cutter toward the axis of said holder, means for releasing the driving mechanism from engagement with one of said rotatable members, automatic means for accelerating the movement of the slower moving member to cause said mechanism to restore the cutter to normal position, and automatic means for restoring the engagement of the driving mechanism.

14. In a machine of the class described, a log holder, a pair of rotatable members movable in the same direction in a plane at right angles to the axis of said holder, a cutter pivotally mounted on one of said members, lever mechanism pivotally connecting said cutter with the other of said members, driving mechanism for simul-

taneously rotating said members at different rates of speed whereby said lever mechanism will cause the movement of the cutter toward the axis of said holder, a spring opposing the differential movement between said rotatable members, and means for automatically releasing said driving mechanism from engagement with one of said rotatable members when the cutter has crossed the axis of the log being cut, said spring being operable thereupon to accelerate the movement of the slower moving member to cause said lever mechanism to restore the cutter to normal position.

15. In a machine of the class described, a log holder, a cutter movable in a plane at right angles to the axis of the holder, a rotatable member on which said cutter is pivotally mounted, a driven gear movable in the same direction as said rotatable member, lever mechanism connecting said cutter with said gear, driving mechanism, means for rotating said gear and rotatable members from said driving mechanism, the gear being driven at a slower rate of speed than said rotatable member, whereby said lever mechanism will cause the movement of said cutter toward the axis of said holder, and means operating independently of the driving mechanism for restoring said cutter to normal position after its cutting edge has crossed the axis of the log being cut.

16. In a machine of the class described, a log holder, a pair of rotatable members movable in the same direction in a plane at right angles to the axis of said holder, a cutter pivotally mounted on one of said members, lever mechanism pivotally connecting said cutter with the other of said members, means for driving said rotatable members at different rates of speed whereby said lever mechanism will cause the movement of said cutter toward the axis of said holder, and means for adjusting the throw of said lever mechanism.

17. In a machine of the class described, a log holder, a rotatable member movable in a plane at right angles to the axis of said holder, a stud mounted on said member, a gear rotatably mounted on said rotatable member and provided with a slot for receiving said stud, an arm pivotally mounted intermediate its ends on said stud, a cutter mounted in one end portion of said arm, a lever pivotally connecting the other end of said arm with said gear, means for simultaneously rotating said member and said gear, but the gear at a slower rate of speed than said rotatable member whereby said studs will be carried forward in said slots by said rotatable member to cause the lever mechanism to move said cutter toward the axis of the log being cut, a coil spring connected at its opposite ends, respectively, to said gear and said rotatable member, and opposing the differential movement between these parts, and means for automatically releasing the driving mechanism from operable connection with said gear, said spring being thereupon operable to accelerate the movement of said gear to cause said lever to rock said arm upon its pivot and restore the cutter to normal position.

18. In a machine of the class described, a log holder comprising a back-plate and a pivotally-supported breast-plate, and means for simultaneously adjusting said plates bodily toward or from each other, to enable the holder to accommodate logs of varying size.

19. In a machine of the class described, a log holder comprising a pivotally-mounted back-plate, a lever pivotally mounted at one end thereto and having rocking engagement with the frame of the machine intermediate its ends, a breast-plate, arms pivotally connected at their upper ends to said breast-plate and at their lower ends to the outer end of said lever, means for adjusting the elevation of said back-plate whereby through said lever and arms to simultaneously move the breast-plate toward or from the back-plate, and means for locking said plates in their adjusted positions.

20. In a machine of the class described, a log holder comprising a relatively stationary back-plate and a pivotally-supported breast-plate, a member operatively engaging said breast-plate to force the forward portion of the breast-plate into clamping engagement with the log, and means operated by the machine to release at intervals the engagement of said member and the consequent pressure of the breast-plate on said log.

21. In a machine of the class described, a log holder comprising a relatively stationary back-plate and a pivotally-supported breast-plate, a member operatively engaging said breast-plate to force the forward portion of the breast-plate into clamping engagement with the log, means operated by the machine to release at intervals the engagement of said member and the consequent pressure of the breast-plate on said log, and means for advancing the log during the period when the pressure of the breast-plate thereon is released.

22. In a machine of the class described, a log holder comprising a back-plate and a pivotally-mounted breast-plate, an arm on said breast-plate, a spring-pulled pivoted lever normally engaging said arm under the pull of said spring to force the forward portion of the breast-plate into clamping engagement with the log, automatic means for rocking said lever at intervals whereby to release engagement thereof with said arm and thereby release the clamping pressure of the breast-plate on the log, and means for

advancing the log during the period when the pressure of the breast-plate thereon is released.

23. In a machine of the class described, in combination with a log holder, differential driving mechanism, a cutter pivotally mounted at separated points, respectively, to two members of said differential driving mechanism, whereby said cutter may be rotated about the axis of the holder and simultaneously moved toward said axis, a slidably-mounted drive shaft from which said driving mechanism is actuated, a clutch member carried by the driving shaft and frictionally engaging one member of the driving mechanism, means operated by the machine to move said shaft longitudinally to release said clutch member from engagement with its corresponding driven member, and automatic means operating on the release of said clutch to accelerate the movement of the slower of the differential members actuating said cutter whereby to restore the latter to normal position.

24. In a machine of the class described, in combination with a log holder, differential driving mechanism, a cutter pivotally mounted at separated points, respectively, to two members of said differential driving mechanism, whereby said cutter may be rotated about the axis of the holder and simultaneously moved toward said axis, a slidably-mounted drive shaft from which said driving mechanism is actuated, a clutch member carried by the driving shaft and frictionally engaging one member of the driving mechanism, means operated by the machine to move said shaft longitudinally to release said clutch member from engagement with its corresponding driven member, automatic means operating on the release of said clutch to accelerate the movement of the slower of the differential members actuating said cutter whereby to restore the latter to normal position, and automatic means for moving the shaft in the opposite direction and restoring the engagement of the clutch member with its driven member.

25. In a machine of the class described, in combination with a log holder, differential driving mechanism, a cutter pivotally mounted at separated points, respectively, to two members of said differential driving mechanism, whereby said cutter may be rotated about the axis of the holder and simultaneously moved toward said axis, a slidably-mounted drive shaft from which said driving mechanism is actuated, a clutch member carried by said shaft and frictionally engaging one member of the driving mechanism, means operated by the machine to move said shaft longitudinally to release said clutch member from engagement with its corresponding driven member, automatic means operating on the release of said clutch to accelerate the movement of the slower of the differential members actuating said cutter whereby to restore the latter to normal position, means operated from said shaft to advance the log while said clutch member is disengaged, and automatic means for moving the shaft in the opposite direction and restoring the engagement of the clutch member with its driven member.

26. In a machine of the class described, a log holder comprising a back-plate and a pivotally-mounted breast-plate, a pivotally-mounted, spring-pulled lever operatively engaging said breast-plate under the pull of said spring to force it into clamping engagement with a log mounted in the holder, a feed device for engaging said log, a rotatable cutter, a slidably-mounted drive shaft from which said cutter is operated, a contact-member on said drive shaft for engaging said lever, and mechanism operating in the rotation of said drive shaft to move the latter longitudinally and bring said contact device into engagement with said lever whereby to release pressure upon said breast-plate, and mechanism operated thereupon to move said feed device and thereby advance the log.

27. In a machine of the class described, in combination with a log holder, a pair of opposing cutters operatively mounted with respect to said holder and adapted to have arcual movement, and means for simultaneously actuating said cutters to cause them to continuously encircle and progressively move inward toward the axis of a log held in said holder, until their cutting edges are brought in line substantially at the axis of the log.

28. In a machine of the class described, in combination with a log holder, a pair of opposing cutters operatively mounted with respect to said log holder, means for simultaneously rotating said cutters around a log held in said holder and for progressively and continuously moving them inward on arcual lines until their cutting edges are brought in line at the axis of the log, and means for automatically separating said cutters.

29. In a machine of the class described, a log holder, a pair of rotatable members movable in a plane at right angles to the axis of said holder, a pair of cutters pivotally mounted in opposed relation on one of said members, actuating mechanism operatively connecting said cutters with the other rotatable member, and means for driving said rotatable members in the same direction at different rates of speed whereby said mechanism will be caused to move said cutters toward each other until their cutting edges are brought in line at the axis of the log being cut.

30. In a machine of the class described, a log holder, a pair of rotatable members movable in a plane at right angles to the axis

of said holder, a pair of cutters pivotally mounted in opposed relation on one of said members, actuating mechanism operatively connecting said cutters with the other rotatable member, means for driving said rotatable members in the same direction at different rates of speed whereby said mechanism will be caused to move said cutters toward each other until their cutting edges are brought in line at the axis of the log being cut, and means for automatically accelerating the movement of the slower of said driven members whereby said mechanism will be caused to reverse the pivotal movement of said cutters.

In testimony whereof, we have hereunto set our hands.

JOHN E. MITCHELL.
DENNIS PARKS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."