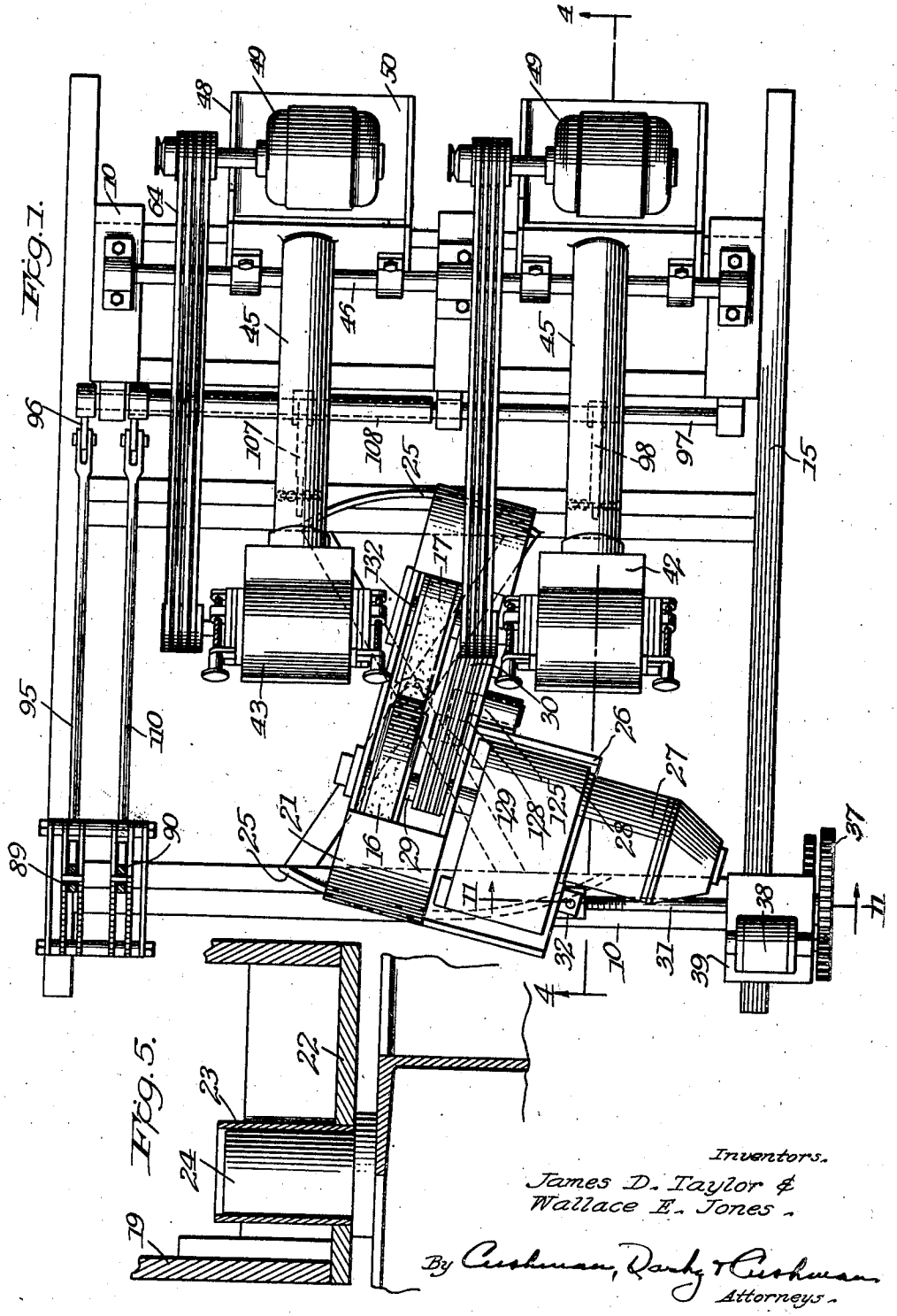
Dec. 15, 1942. J. D. TAYLOR ET AL 2,305,281

ROSSING MACHINE

Original Filed July 7, 1937 5 Sheets-Sheet 1




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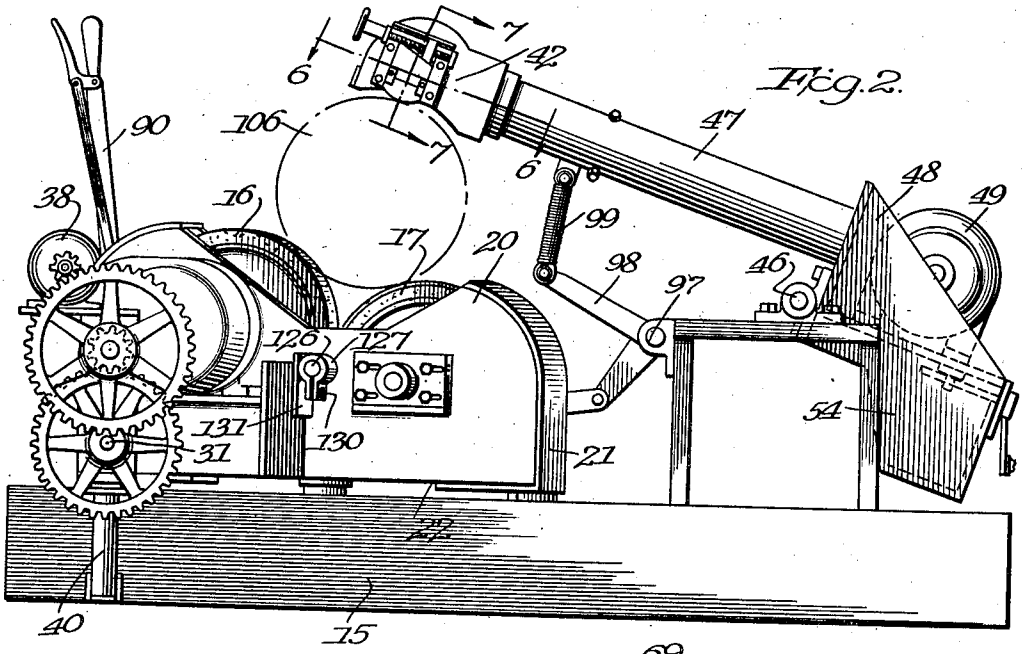
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ROSSING MACHINE

Original Filed July 7, 1937 5 Sheets-Sheet 2

Fig. 2.



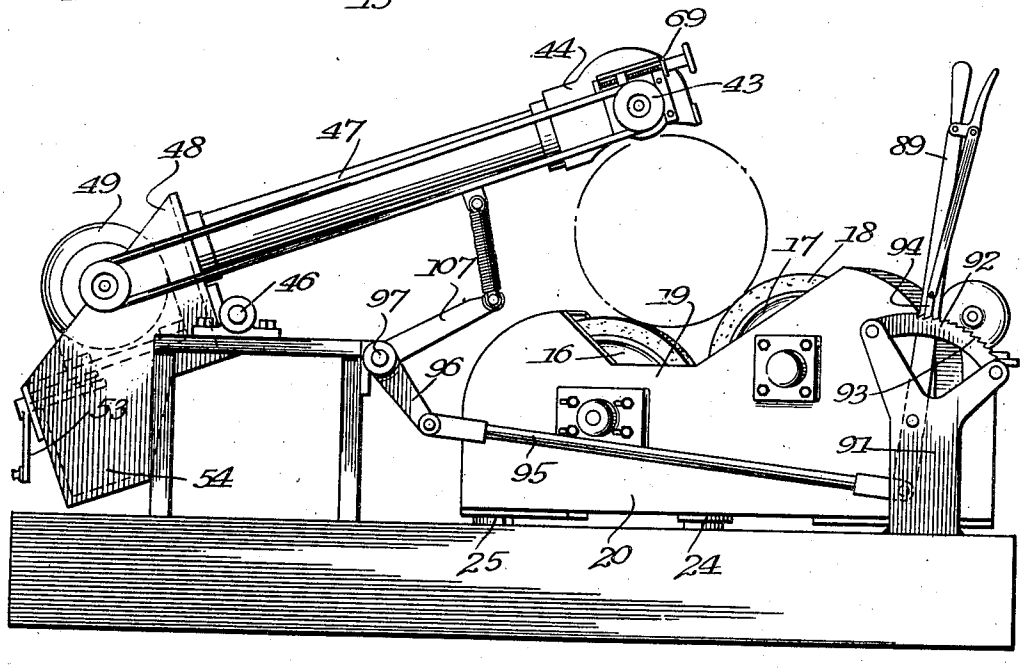




Fig. 3.

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Fig. 4.

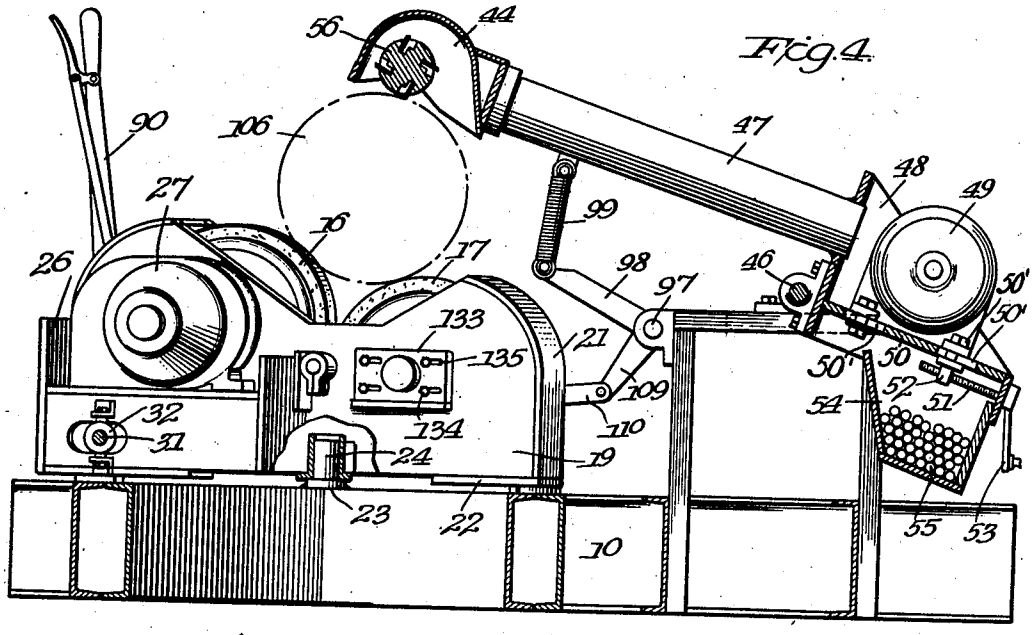



Fig. 8.

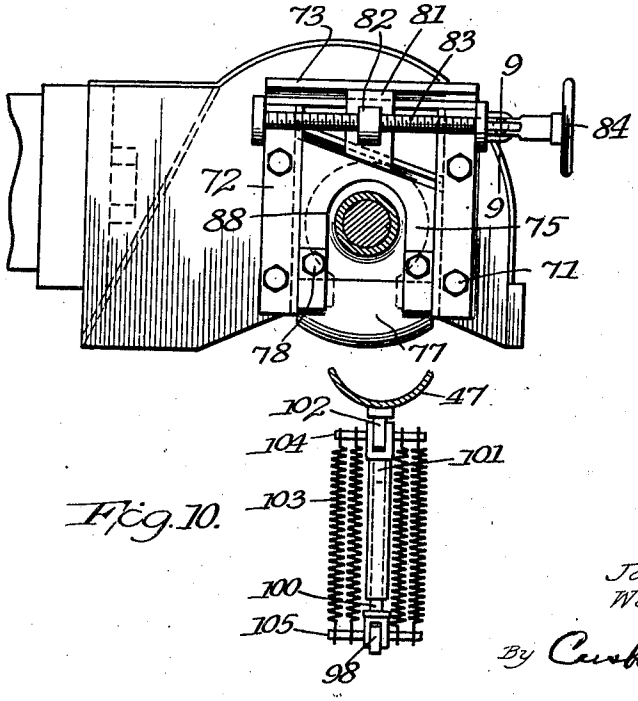
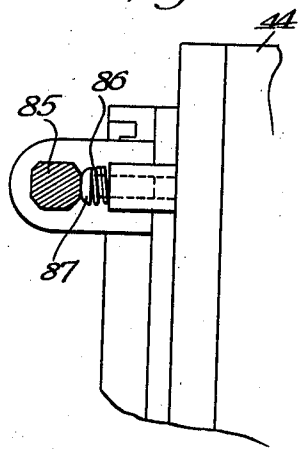



Fig. 10.

Fig. 9.




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ROSSING MACHINE

Original Filed July 7, 1937 5 Sheets-Sheet 4

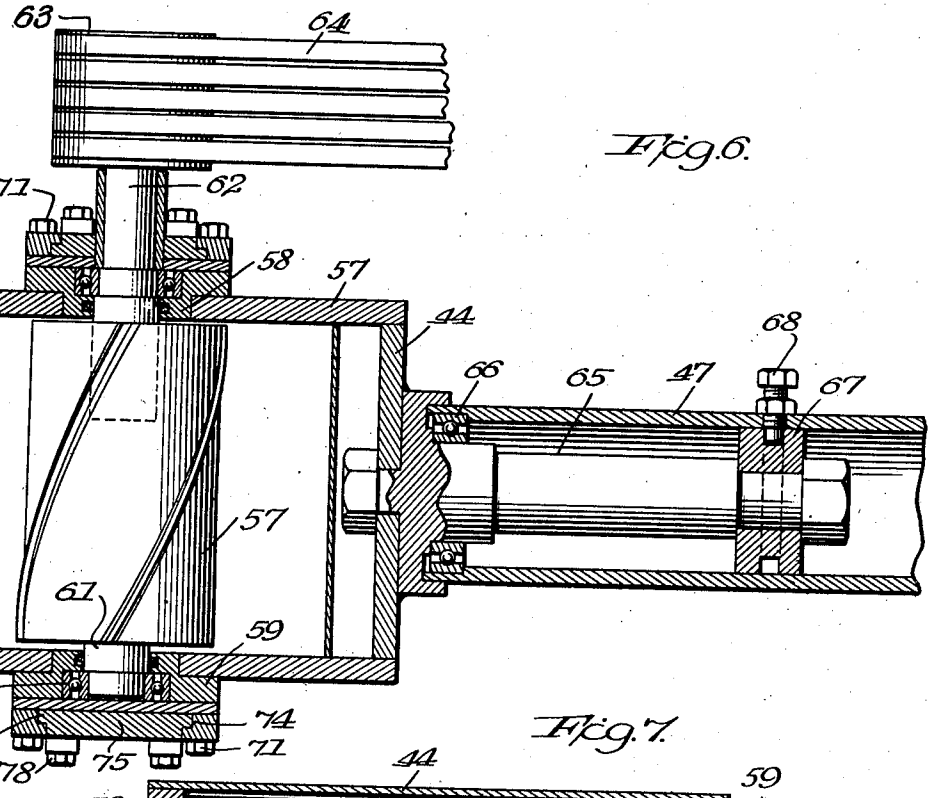
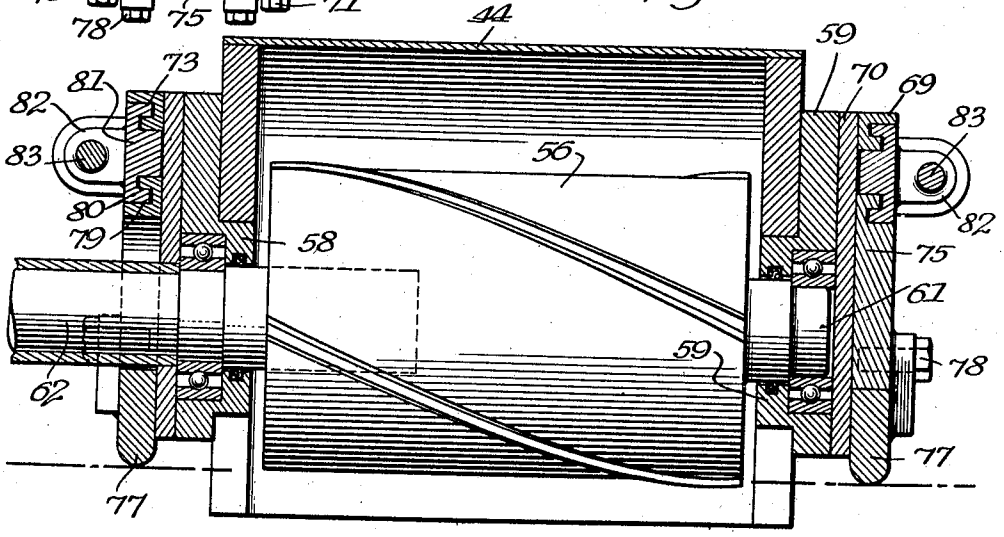



Fig. 6.

Fig. 7.




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ROSSING MACHINE

Original Filed July 7, 1937 5 Sheets-Sheet 5

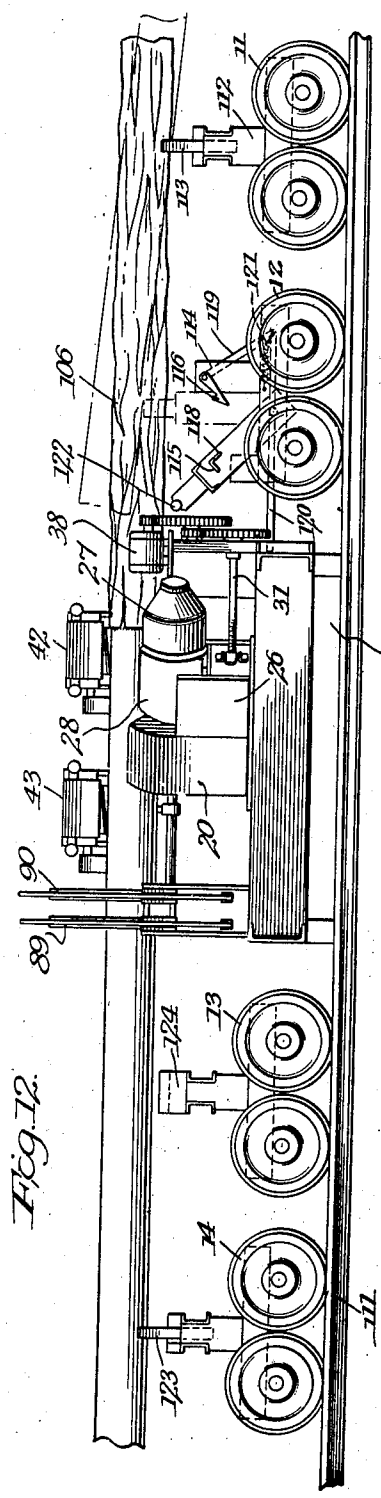


Fig. 12.

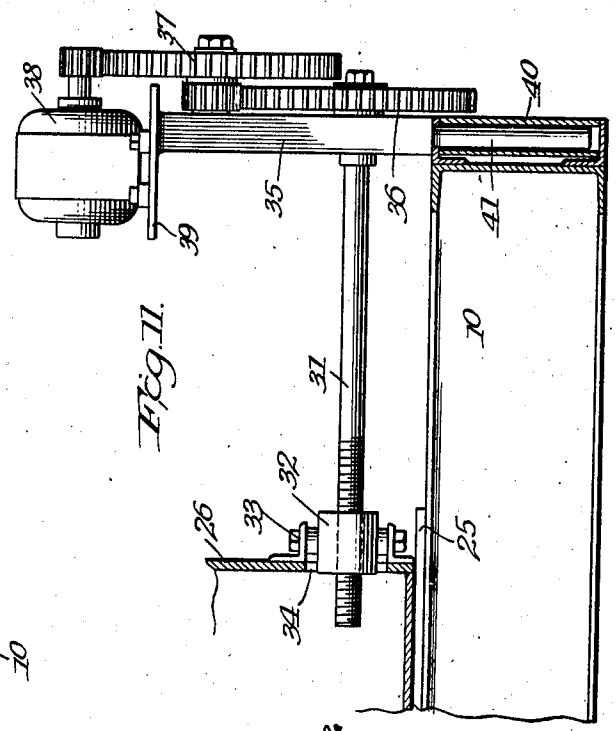


Fig. 11.

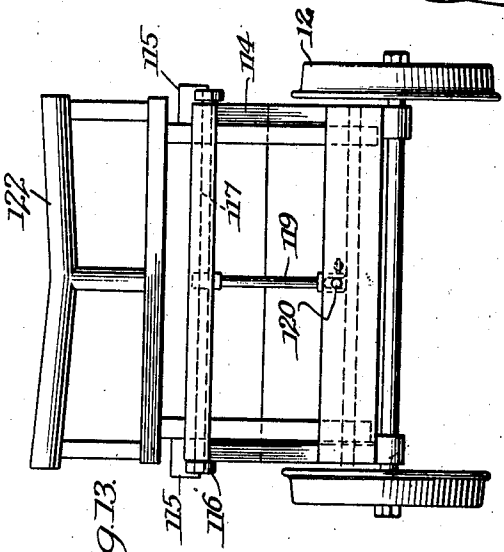


Fig. 13.

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Patented Dec. 15, 1942 2,305,281

# UNITED STATES PATENT OFFICE

2,305,281

## ROSSING MACHINE

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Original application July 7, 1937, Serial No. 152,461, now Patent No. 2,230,336, dated February 4, 1941. Divided and this application November 4, 1940, Serial No. 364,304

3 Claims. (Cl. 144—208)

The present invention relates to pole rossing machines and is a division of our copending application Serial No. 152,461, filed July 7, 1937, for Rossing machine issued as Patent No. 2,230,336 on February 4, 1941.

An object of the invention is the provision of a pivoted and balanced cutter support carrying a cutter head on one side of the pivot and a motor on the other side, these elements being so balanced that the cutter head may be initially moved into operative contact with a pole to be rossed without any cutting pressure being applied to the cutter head. Thereafter, a gradually increasing spring presure is adapted to be applied to the cutter head to hold the latter in operative cutting position against the pole to be rossed.

A further object is the provision of means for adjusting the motor on its support to insure perfect balancing of the cutter head and motor at all times.

Another object is the provision of an adjustable mechanism carried by the cutter head for determining the depth of cut, said mechanism including pole engaging shoes which may be easily and quickly removed when worn and replaced with new shoes.

With the foregoing and other objects in view, the invention will now be more fully described, reference being had to the accompanying drawings, in which:

Figure 1 is a top plan view of the pole rossing machine.

Figure 2 is an elevation showing the end of the machine into which the poles are fed.

Figure 3 is an elevation showing the end of the machine from which the poles are discharged.

Figure 4 is a section taken on line 4—4 of Figure 1.

Figure 5 is an enlarged fragmentary view of the pivot for the wheel support.

Figure 6 is a section taken on line 6—6 of Figure 2.

Figure 7 is a section taken on line 7—7 of Figure 2.

Figure 8 is an enlarged view showing the shoe adjusting means.

Figure 9 is a section taken on line 9—9 of Figure 8.

Figure 10 is a detail of the springs and telescoping member secured to the cutter support.

Figure 11 is a section taken on line 11—11 of Figure 1.

Figure 12 is a front elevation of the machine showing a pole in the process of being rossed and the buggies for supporting the ends of the pole, and

Figure 13 is an end elevation of one of the buggies.

Referring now to the drawings and particularly to Figures 1 and 12, the numeral 10 designates a rossing machine through which logs or poles are adapted to be fed for the purpose of removing bark. Each pole is fed to the machine upon a pair of buggies or trucks 11 and 12 and as the rossing operation progresses, the debarked end of the pole is gradually moved over and finally supported upon a second pair of buggies 13 and 14. The function and use of each of these buggies will be described in more detail further on in the specification.

The rossing machine comprises a base or frame 15 upon which are mounted pole rotating and feeding means and a plurality of cutters for giving first a roughing cut and then a finishing cut to the pole as it passes through the machine. The pole rotating and feeding means comprises a pair of wheels 16 and 17 respectively which may be formed of cast iron or any other suitable material and each wheel is provided with a solid rubber tire 18 for providing maximum traction surface during the pole rotating and feeding operation. The wheels 16 and 17 are journaled in the side walls 19 of a casing 20 and are positioned in alignment with each other with their axes in parallel and non-movable relation with respect to each other.

The casing 20 is provided with end walls 21, which with the side walls partially house the wheels 16 and 17. The base 22 of the casing is provided with a centrally disposed opening in which is fitted a bearing 23 and this bearing cooperates with a king pin 24 mounted on the frame 15 to permit limited rotation of the casing and wheels on the frame. The frame is also provided with spaced rails 25 which support opposite ends of the casing 20 and upon which the casing rides when it is moved about its pivot. One side of the casing 20 is extended to provide a transmission support 26. The transmission comprises an electric motor 27 and reduction gearing 28 through which power is transmitted to the wheel 16 by way of shaft 29. The motor 27 and gearing 28 may be of any desired construction and is merely shown diagrammatically in the drawings. Power is transmitted to the other wheel 17 by a belt or sprocket 30.

With this arrangement, power from the motor 27 will rotate the wheels 16 and 17 and by reason of the belt 30 both wheels will rotate in the

same direction and at the same speed. Moreover, it will be observed that the king pin 24 is positioned directly in alignment with the wheels 16 and 17 and at a point midway between the axes of the wheels. This arrangement is necessary in order to properly adjust the wheels to take care of poles or logs of different diameters. That is, in order to impart a feeding action, as well as a rotating motion to the poles, it is necessary that the wheels be moved about the pivot point 24 out of perpendicular alignment with the poles. With poles of substantially large diameters the wheels need only be adjusted slightly out of their perpendicular position, since a very slow feeding action is required to obtain the desired cut. It will be apparent that poles of relatively small diameter must necessarily be fed through the machine at a greater speed than poles of large diameter, since it requires less time for the cutters to remove bark during on revolution of a pole of small diameter than it does of poles of greater diameter. In the case of poles of small diameter, therefore, the wheels will be adjusted to a greater inclination to the perpendicular in order to speed up the rate of feed of the pole through the machine.

To permit the adjustment of the wheels to be made with relative ease and without considerable loss of time, such as would be necessary with a manual operation, the present machine is provided with a motorized means for the angular setting or adjustment of the wheels 16 and 17. This means comprises a threaded shaft 31 (see Figures 1 and 11), extending substantially horizontally of and slightly above the base of the frame 10. One end of this shaft passes through a threaded opening in a block 32 which is pivotally mounted in brackets 33 secured to a wall of the transmission support 26. These brackets are positioned on opposite sides of an opening 34 through which the nut 32 partially projects. The inner end of the shaft 31 passes through the opening 34 and terminates within the support 26. The outer end of the shaft 31 is journaled in a bracket 35 and has secured to its extreme outer end a gear wheel 36 forming one element of a reduction gearing 37. This gearing connects the shaft 31 with the shaft of an electric motor 38, said motor being suitably supported upon a platform 39 carried at the upper end of the bracket 35.

When it is desired to adjust the angular setting of the wheels 16 and 17 to accommodate different sizes of poles, the motor 38 is started and this imparts power through the reduction gearing 37 to shaft 31 which is slowly rotated. By reason of the threaded engagement between the inner end of the shaft and the nut 32, the latter rides on the shaft and thus moves the support 26 and casing 20 about the pivot of the king pin 24. This in turn adjusts the wheels to the desired angular position to accommodate the pole which is to be fed through the machine. It will be observed that the movement of the support 26 and nut 32 necessarily changes the axis of the shaft 31 and for this reason the shaft cannot be rigidly mounted on the frame, but must be capable of a slight lateral movement. This is taken care of by securing a socket 40 to the frame 10 and providing the bracket 35 with a stub axle 41 fitting into the socket, thereby permitting rotation of the bracket, gearing, and the shaft 31.

Referring to Figures 1 to 4, it will be observed that as the pole is fed and rotated through the machine by the wheels 16 and 17, the bark is removed therefrom first by a cutter 42 which gives a preliminary or roughing cut and then by a cutter 43 which gives a finishing cut. Each cutter is mounted in a cutter head 44 carried at one end of a cutter head support 45 which is pivotally mounted on a horizontal shaft 46 secured at the rear of the frame 15. The support 45 comprises a substantially tubular member 47 to one end of which the cutter head is swivelly mounted, while the other end of the tubular member is rigidly connected to a motor housing 48. A motor 49 for operating the cutter is slidably supported upon a plate 50 fixed to the housing 48. The plate 50 is provided with sets of front and rear aligned slots 50'. Suitable front and rear bolts 50'' are connected to opposite sides of the motor base and extend through the slots 50'. A cross bar 52 connects the front bolts 50'' and is provided with a threaded opening to receive a threaded rod 51. This rod is journalled against longitudinal movement in the front of the casing 48 and is connected to an operating handle 53. By operating the handle 53, the rod 51 is rotated and the cross bar 52 is moved, and in turn slides the motor 49 on the plate 50. With this arrangement the motor may be adjusted with respect to the tubular member 47 and the cutter head 44 so that the whole cutting unit may be perfectly balanced about the pivot 46. As a further means for balancing the cutter support, there is provided a shot bin or ballast box 54 carried by the housing 48 directly below the plate 50 and adapted to contain any suitable ballast 55.

Referring to Figures 6 and 7, the cutter head 44 comprises a casing for housing a rotatable cutter 56 which is adapted to be positioned longitudinally of the pole or log during the cutting operation. This casing is provided with side plates 57 having aligned openings for receiving the shouldered portions 58 of bearing housings 59, each housing being designed to accommodate a bearing 60. The cutter 56 is provided at one end with a stub shaft 61 journaled in one of the bearings, while a stub axle 62 is journaled in the other bearing and has secured to its outer end a pulley 63. Power is transmitted from the shaft of the motor 49 to the cutter 56 by suitable belting 64 engaging the pulley 63.

In order that the cutters may compensate for irregularities in the log or pole being operated on, each cutter head is swivelly mounted on the end of its tubular supporting element 47. This is accomplished by providing a stub shaft 65 rigidly secured to the rear wall of the cutter head and projecting into the tubular member 47. The outer end of the shaft 65 is journaled in a roller bearing 66 housed within the tubular member, while the inner end of the shaft is provided with a grooved collar 67 retained in position within the tubular element by one or more set screws 68. With this arrangement each cutter head and cutter is permitted to rotate on an axis transverse to the axis of the tubular support 47 and thus is capable of compensating for any irregularities in the pole being operated on.

Means are provided to adjust the cutter head and cutter with respect to a pole passing through the machine to determine the depth of cut to be made. This means comprises a pair of spaced adjusting elements 69, each of which is secured to a plate 70 which is in turn secured to and constitutes a part of the bearing housing 58. Any suitable means, such as the threaded bolts 71 may be utilized to secure these members in operative position. Each adjusting element comprises a pair of spaced bars 72 located on opposite sides

of the axis of the cutter 56 and connected at their upper ends by a cross bar 73. Each bar 72 is undercut on its inner surface to provide a guide slot 74 and a shoe supporting plate 75 is slidably mounted within the guides and is provided on each side with longitudinally extending flanges 76 movable in the recessed portions 74. To the lower end of the plate 75 is secured a pole engaging shoe 77 and this is detachably connected to the plate by bolts 78 to permit replacement of the shoe after being worn out.

The upper edge of the plate 75 extends diagonally from side to side and is provided with a transversely extending groove 79 cooperating with a rib or tongue 80 on a block 81 to form an interlocking or interfitting connection between the block and plate. The block 81 is provided with an off-set boss 82 having a threaded opening through which projects the threaded shank of a spindle 83. This spindle is suitably journaled in the upper end of the adjusting element 69 and is provided with a handle 84 projecting outwardly from one side of the cutter head. When it is desired to adjust each set of shoes 77 with respect to its cutter head and cutter to determine the depth of cut, it is merely necessary to actuate the handle 84, thereby rotating the spindle 83. This operation moves the block 81 on the spindle transversely of the adjusting element and by reason of the interfitting engagement between the block and plate, the plate 75 will be moved longitudinally of the cutter and thereby raise or lower the shoe 77 with respect to the cutter and cutter head.

In order that each shoe may be locked in adjusted position, the spindle 83 adjacent the handle 84 is squared as at 85. Mounted on the cutter head at this point is a spring pressed plunger 86 having a head 87 normally urged into contact with one of the squared surfaces 85 of the spindle to lock the latter against rotation. It will be apparent that with the spindle locked in this position there can be no transverse movement of the block 81 and thus each shoe is positively retained in each of its adjusted positions.

It will be observed that on each cutter head the right hand set of plates 70 and 75 (see Figures 6, 7 and 8), are substantially solid in construction due to the fact that the stub shaft 61 terminates interiorly of the plates. With respect to the plates on the left hand side of the cutter head, as viewed in these figures, the plate 70 is provided with an opening surrounding the stub axle 62, while the shoe supporting plate 75 is provided with a cut out portion forming spaced legs 88 which straddle the stub shaft 62 and thus permit the plate 75 to move longitudinally in the adjusting element 69.

Referring now to Figures 1 to 4, it will be observed that the cutter heads 42 and 43 are mounted side by side and by reason of the shaft 46 about which the supports 45 pivot, the cutter heads may be raised and lowered into and out of operative engagement with the poles as they pass through the rossing machine. Because of the balanced arrangement of the supports 45, each head may be moved into engagement with the pole without pressure being applied through the cutter head to the pole. Means are provided to move each head into this initial position of contact with the pole and then to subsequently apply a gradual spring pressure to the head and cutter to hold the latter against the pole during the cutting operation. This means comprises a pair of hand levers 89, 90, respectively, the former for actuating the cutter head 42 and the latter the cutter head 43. The handles are suitably mounted in brackets 91 carried by the frame 15 and each bracket is provided with a quadrant 92 havinging teeth 93 which cooperate with a pawl 94 to maintain its lever in any one of a number of different positions. The lever 89 is pivotally connected to a cross link 95 which in turn is pivotally connected to a depending arm 96 rigidly mounted upon a cross shaft 97 extending across and journaled in suitable bearings in the frame. A second arm 98 also rigidly connected to the shaft 97 is associated with the tubular element 47 of the cutter head 42 by a combination spring and telescoping connection 99. Referring to Figure 10 it will be observed that one of the telescoping elements 100 is pivotally connected to the outer free end of the arm 98, while the other element 101 is pivotally connected to a bracket 102 secured to the underside of the tubular member 47. In this view the element 100 is telescoped within the element 101 and the elements are normally retained in telescoped relation by means of the coil springs 103. These springs are mounted upon upper and lower rods 104 and 105 respectively, the upper one being carried by the bracket 102, while the lower one is mounted in the arm 98. In this view a pair of springs are positioned on opposite sides of the telescoping members 100 and 101 and extend substantially parallel thereto.

The combination of the springs 103 and the telescoping elements 100 and 101 provide a positive operating connection between the cutter support 45 and the arm 98. In the movement of the cutter head 42 to and from its operative position, the springs will maintain the elements 100 and 101 in telescoped position, so that they constitute a solid pivoted link, cooperating to positively move the cutter into and out of engagement with a pole. At the same time, just as soon as the cutter has been moved into contact with a pole, the telescoping members will lose their function as a positive operating connection and permit expansion of the springs to apply a gradually increasing tension upon the pole through the cutter head.

With this arrangement, and assuming that the cutter head 42 is to be moved into operative position, the handle 89 is first moved forwardly. This will move the link 95 rearwardly, and the arm 96 downwardly, rotating the shaft 97. The arm 98 being rigidly mounted on the shaft will move downwardly and by reason of the connection 99, will move the balanced cutter support 45 about its pivot and bring the cutter head 42 and the cutter 56 into contact with the pole 106. Because of the balanced arrangement, no pressure will be applied to the pole upon initial contact therewith of the cutter head and cutter. However, upon further actuation of the handle 89 the springs will be expanded and will apply a gradually increasing tension upon the pole through the cutter head. The handle will be actuated sufficiently to maintain a continued spring tension on the cutter during the cutting operation. It is to be understood that before the handle 89 is actuated, the shoes 77 will have been adjusted to determine the depth of cut desired. The downward movement of the arm 98 is such that the telescoping elements will not become disengaged. That is, the spring pressure required to efficiently hold the cutter head and cutter in contact with the pole will never be

such as to require a movement sufficient to uncouple the elements 100 and 101.

With respect to the cutter 43, the same spring connection 99 is utilized as above described and the lower end of this element is connected to an arm 107 which is rigidly secured to a sleeve 103 mounted on the shaft 97 and capable of rotating relative thereto. A second arm 109 corresponding to the arm 96 is rigidly secured to the sleeve 108 and is connected to the handle 90 by a cross link 110 corresponding to the link 95. With this structure the finishing cutter head 43 may be moved into and out of operative position in a manner similar to that described with respect to the cutter head 42.

Referring to Figure 12, and assuming that it is desired to pass a log or pole through the machine 10 to remove the bark therefrom, the pole 106 is initially supported upon the trucks or buggies 11 and 12 which are movable over the track 111. The buggy 11 is provided with an upright frame 112 within which are amounted a pair of pole supporting wheels 113. The truck 12 is provided with an upright bracket 114 rigidly mounted thereon and a pole supporting arm 115 pivotally mounted on the frame to swing from the dotted line to the full line position. The arm 115 is normally maintained in the dotted line position by means of a pair of latches 116. These latches are rigidly mounted upon opposite ends of a cross shaft 117 pivotally mounted in the bracket 114 with the latches positioned on the outside of the bracket and engaging the angle iron 118 extending across the pole supporting arm 115. A downwardly extending rod 119 has its upper end rigidly connected to the cross shaft 117, while its lower end is pivotally connected to the rear end of a longitudinally extending plunger 120. The free front end of this plunger projects forwardly in advance of the front of the buggy and is normally retained in this position by a spring 121 having one end thereof connected to the frame of the buggy and its other end secured adjacent the pivot point between the plunger and the rod 119. The spring normally urges the plunger to its forward position with the latches 116 in operative engagement with the angle iron 118.

It will be observed that when the arm 115 is in its upright latched position the pole supporting cross bar 122 is at a higher level than the top of the wheels 113. The bar 122 is also higher than the pole receiving portions of the wheels 16 and 17 in order that the pole as it is moved forwardly will initially be supported above the feed wheels. That is, the pole will be placed upon the buggies 11 and 12 with sufficient overhang to overlie the wheels 16 and 17 as the truck 12 moves into close proximity to the frame 10. With the pole in this position, the buggy 12 will move forwardly until the free end of the plunger 120 contacts the frame. This will move the rod 119 rearwardly against the tension of the spring 121 and release the latches 116 from the cross bar 118. The arm 115 will then drop forwardly and downwardly to the full line position away from the pole and permit the pole to come into contact with the feed wheels 16 and 17. As the pole is fed through the machine the front end will eventually move over and come into contact with the wheels 123 of the truck 14. These wheels, as shown in Figure 12, are of greater height than the pole supporting block 124 of the buggy 13 so that the pole will not come into contact with the block 124 until it passes entirely out of engagement with the wheels 16 and 17. At this time the log will be completely debarked. It will be apparent that after the front of the pole comes into engagement with the wheels 123, the buggy 14 will gradually move forwardly with the log so that by the time the end of the pole is engaged by the block 124, the buggy 14 will be a substantial distance from the buggy 13. This action takes place in reverse order as the pole is being fed to the machine. That is, the buggies 12 and 11 support the front and rear end of the log and initially are spaced apart substantially the length of the log or pole, with the buggy 11 gradually moving toward the buggy 12 as the pole is being fed through the machine.

Referring again to Figs. 1 and 2, the numeral 125 designates a belt tightener having a stub 126 clamped in a collar 127, and passing into the casing 20 where it terminates in an eccentric arm 128. A belt engaging pulley 129 is mounted on this arm and is adapted to take up any slack in the belt 30 when necessary. This is accomplished by loosening the screw 130, which permits rotation of the stub and arm 128. The collar 127 is suitably carried by a plate 131 mounted on the support 26. Means are also provided to permit adjustment of the wheel 17 with respect to the wheel 16. This is accomplished by mounting the hub 132 of the wheel in plates 133, each of which is adjustably mounted on the exterior of one of the casing walls 20 by means of bolts 134 engaging in slots 135.

It will be understood that the invention is not limited to the details of construction shown in the drawings and described in the specification, and that the phraseology employed in the specification is for the purpose of description and not of limitation.

We claim:

1. In a pole rossing machine, a frame, a balanced cutter support pivotally mounted intermediate its ends on said frame, a cutter mounted adjacent the front of said support and adapted to be moved into cutting engagement with a pole being fed through the machine, spring means connected to the under side of said cutter support in advance of its connection to the frame, a shaft mounted on said frame and having an arm connected to said spring, and means for rotating said shaft for initially moving the cutter into contact with a pole and then applying spring pressure to said cutter to hold the latter against the pole during the cutting operation.

2. In a pole rossing machine, a frame, a balanced cutter support pivotally mounted intermediate its ends on said frame, a cutter mounted on said support and adapted to be moved into cutting engagement with a pole being fed through the machine, operating means for said cutter support comprising an arm pivotally mounted on said frame below said cutter support and in advance of its point of connection to the frame, a telescoping member having one section pivoted to the under side of the cutter support and its other section pivoted to said arm, a spring extending substantially parallel to and connecting said sections to normally maintain them in telescoped position, and an operating handle associated with said pivoted arm for initially moving the cutter into contact with a pole and then applying spring pressure to said cutter to hold the latter against the pole during the cutting operation.

3. In a pole rossing machine, a frame, a bal-

anced cutter support pivotally mounted intermediate its ends on said frame, a cutter mounted on said support and adapted to be moved into cutting engagement with a pole being fed through the machine, operating means for said cutter support comprising an arm pivotally mounted on said frame below said cutter support and in advance of its point of connection to the frame, a telescoping member having one section pivoted to the under side of the cutter support and its other section pivoted to said arm, the pivotal connections between said telescoping sections and arm and cutter support including a pair of rods, each extending upon opposite sides of its respective section, a pair of coil springs each extending between said rods and located on one side of the member to normally maintain said sections in telescoped position, and an operating handle associated with said pivoted arm for initially moving the cutter into contact with a pole and then applying spring pressure to said cutter to hold the latter against the pole during the cutting operation.

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