Extension Pruning Saw.

To all whom it may concern:

Be it known that I, Leon J. Barrett, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Extension Pruning Saw, of which the following is a specification.

This invention relates to a pruning device of the type in which a saw is movably mounted at the end of a long pole or rod to permit of sawing off limbs from the ground or a vehicle moving about under the trees or from the lower limbs.

The principal objects of the invention are to provide a more effective and convenient mechanical device for reciprocatingly supporting and operating the saw than has been used heretofore; to provide an improved arrangement for clamping the hook to the limb and improvements in the hook itself so that the limb will be securely held within it or, in other words, the pole and the whole apparatus fixed in a definite position with respect to the limb and held there while the operation is being performed; to provide simple means for turning the saw into different positions with respect to the supporting pole so that it can be brought around to make its cut on either side of the limb; to provide the hook for engaging the limb and effectively steadying and supporting the whole device in such form as to be capable of relative movement to the pole to permit the pole with the saw thereon to be moved away from the limb so that the saw can then be turned from one side of the limb to the other, without altering the engagement of the device with the limb, and at the same time the two kerfs thus made will always be in the same plane; to provide an improved means for clamping the flexible connections which operate the saw for sawing purposes and turn it from one side to the other; and to provide improvements in the details of construction of the various parts above mentioned.

Reference is to be had to the accompanying drawings, in which

Fig. 1 is a front view of a pruning device constructed in accordance with this invention and shown in position for normal operation;

Fig. 2 is an edge view of the same;

Fig. 3 is a similar view showing the lower part of the device;

Fig. 4 is a view similar to Fig. 1 on a smaller scale, showing a modification;

Fig. 5 is a view of the upper part of the latter device showing the operation of moving the saw from one side of the limb to the other;

Fig. 6 is a similar view showing the saw on the opposite side of the limb from that illustrated in Fig. 1 and also showing another way of holding the device on the limb;

Fig. 7 is a sectional view on the line 7—7 of Fig. 2;

Fig. 8 is a sectional view on the line 8—8 of Fig. 1;

Fig. 9 is a side view of one of the clamping means for the several flexible connections, and

Fig. 10 is an edge view of the same.

As is common in this class of pruning devices, I provide a long pole 10, preferably of wood, constituting the supporting frame for the whole device and designed to be carried around the orchard or among the trees either by hand or otherwise, and moved up into the trees at its upper end to engage the limbs and support it therefrom. All the mechanism is supported on this pole.

For supporting the pole I have provided a hook 11. This hook instead of being of the usual arc shape is of an angular shape to provide at least one angle 13 into which the limb W can enter and providing two bearing points on the hook at an angle to each other, each consisting of a flat side so that there will be very little tendency to a rolling action. This hook is shown in the form of a forging or the like having a shank 15 which may extend down into the pole, as indicated in Figs. 4 and 5, or may be offset, as shown in the other figures, and held against the side of the pole by brackets 14 which surround the pole and have passages for the shank. One of these brackets is provided with a pointed pin 15 adapted to enter a notch 16 in the shank and hold the shank in fixed position. Behind this pin is a spring 17 and a screw 18 for adjusting its pressure. The other bracket is provided simply with a passage for the shank and the shank is provided with a stud 19 adapted to engage this lower bracket and limit the motion of the shank with respect to the pole. These brackets are fixed to the pole by headed fastenings extending through it or in any convenient way.
The hook in ordinary use is intended to be placed over the limb as shown in Figs. 1, 2, 4 and 5, and the resistance of the spring 17 is sufficient so that the whole device will be supported from the pole with the hook in the position shown in Figs. 1 and 2. In other words, the point 15 holds these two parts together and the weight of the pole is not sufficient to overcome the resistance of the spring. If, however, it is desired to lower the pole for a purpose which will be explained later, the operator pulls on it, which overcomes the resistance of the spring and the pole drops down as shown in Fig. 5. It can be restored easily because there is no other depression in the shank 13. When the hook is clamped to the limb the operator can force the pole up until the pin registers with the depression 16 again.

The end of the hook is provided with a sharpened or wedge-shaped point 20. This is not used in the ordinary pruning but when a limb is to be sawed off which is too large to enter the hook, the operator can move the hook up above it and bring it down into the limb parallel with the grain as shown in Fig. 6 to hold the piece in that way. It will be seen, therefore, that the device can be used for the sawing of large limbs that will not go into the hook.

No matter which way the device is supported on the limb, it is adapted to be clamped to it by means of a lever 21 pivoted on the hook. This clamping lever is provided with a spring 29 for normally holding it away from the limb against a stop 21. When released the lever will move out of the way automatically. The lever is extended beyond the hook and provided with a flexible connection 23, preferably in the form of a cord, that passes over guide rollers 24 on the pole down to a suitable clamping device on the pole near the bottom.

I have shown this clamping device in Figs. 9 and 10. It consists of a bracket 25 fixed to the pole and provided with a passage under it in which is pivoted a clamping jaw 26 having a serrated operating edge surface 27. The cord 23 is pulleyed down in the direction of the arrow in Fig. 9 freely and then the clamping jaw 25 is moved against it by a light pressure on a handle 28 mounted on it. Now any force acting to pull the cord up will simply increase the force with which the cord is clamped. It may be stated at this point that this type of fastening device is used in several places in accordance with this invention preferably.

I also mount on the pole a sawing device, I have shown this in Figs. 1 and 2 as comprising a parallel motion construction formed of two parallel levers 30 and two parallel links 31 connecting their ends. The levers are pivoted at their centers on the pole. Connected with this parallel motion structure at the upper end of one of the links 31 is a saw holding arm 32. This is provided with a number of perforations at 39 and a double-edge pruning saw 34 of any desired kind is fixed to it through the perforations. It is to be noted that the saw supporting arm 32 is pivotally mounted but the saw is rigidly mounted on this arm.

In order to swing the saw on its pivot to move it from the position shown in Fig. 1 to that shown in Fig. 5 and through that to the one shown in Fig. 6, I have mounted on the arm 32 a cross bar 35. This is rigidly fixed to the arm and it is connected with two flexible members, preferably cords, 36 by a pair of springs 37. These cords pass under rollers 38 on the pole down to the bottom of it where they are held on an operating lever 40 by means of a pair of clamps 25, as above described.

The operating lever 40 is pivoted near the bottom of the pole on a screw or stud 41 mounted under a bracket 42 which serves to stiffen the parts and guide the lever. At the opposite ends of the lever it is provided with handles 43 for operating it and with eyes or hooks 44 provided with a pair of flexible connections 45, preferably in the form of wire cables. These cables pass over guide rollers 46 on the pole and I have shown them for convenience as crossing each other under the rollers near the lever 40 and passing upwardly parallel with each other. Then they cross each other again over an upper pair of guide rollers 46 on the pole near the lever 30. These cables are connected to the ends of the lower lever 30 by means of links 47. I have shown turn buckles 49 in the cables for adjusting the tension.

The operation of the device is very simple. The pole is transferred to a position under the tree. The flexible connection 23 is loosened so that the spring 29 will move the clamping lever 21 back out of the way. Then the hook is placed over the limb, either as shown in Fig. 1 or as shown in Fig. 6, and the cord 23 is pulled to force the clamping lever 21 firmly into contact with the limb and then held by the clamp 25 below. If it is a large enough limb so that it is desired to saw on the under side first to avoid splitting of the wood, the operator looses cord 23 and pulls down on the pole. This lowers the pole with respect to the hook to the position shown in Fig. 5. Now, he pulls on the end of the proper connection 36 to swing the cross bar 35 over to the left, as is indicated in Fig. 5, until the end of the saw passes to the left under the limb. It will be understood that the parallel motion connection 31—32 is normally pulled down to the position shown in Fig. 5 or as far as it will move in that direction so that the saw does not normally project far above the limb. Now, the op-
erator pulls on cord 23 and pushes up on the pole and the pin 18 automatically springs into the notch 16 when they come into register to hold these parts in the position shown in Fig. 6 and cord 23 is fastened taut. Now, when the device hanging from the limb, and preferably steadied with one hand the operator oscillates the operating handle 40 with the other. In some cases

one operator can steady the pole and a second one can operate the lever 40. The effect of this is to swing the lever 30 about its pivot and, of course, this takes the parallel connections and the saw with it. The saw is held up against the work by one of the springs 37, the two cords 36 being adjusted so that most of the tension is on the one toward the limb.

After having made a cut in the lower side of the limb in that way, the operator then goes through the above mentioned motions again to bring the saw around to the other side of the limb as shown in Fig. 1, and then complete the operation. The rollers 46 are insulated to protect the operator from electric currents. A stop 33 is shown for preventing the saw swinging too far.

In the form shown in Figs. 4 and 5, instead of the parallel construction is provided a single lever 30 employed by itself the links 47 being connected directly to it. Also the shank of the hook 11 is shown as received inside the end of the pole or in a hollow cylinder mounted upon the end. The operation, however, is the same in both cases.

It will be seen, therefore, that owing to the narrowness of the hook a limb can be taken off very close to the trunk. The device is so constructed that it can be made to hang down from the limb so that the limb will support its weight. This relieves the operator of the necessity of even assisting in holding the limb, and an operating lever pivoted near the bottom of the pole and having its two ends connected with said flexible connections.

3. In a tree pruning device, the combination of a pole having a hook on the end for supporting it on a limb at a distance from the ground, a parallel motion connection comprising two parallel levers and two parallel links connecting the ends of said levers pivoted on said pole near the hook, a pruning saw connected with one end of said parallel connection and extending from it in the general direction of the pole, two cables one connected with each end of the lower lever of the parallel motion connection and located on one side of the pole, two sets of rollers for guiding said cables, one near the upper end and the other near the lower end of the pole, said cables crossing each other near the upper rollers and extending down to the rollers and then crossing each other again near the lower rollers, and a lever piv...
oted near the bottom of said pole, the opposite ends of the lever being connected with the two cables, whereby the oscillation of the lever on its pivot will pull down first one cable and then the other and swing the parallel motion connection at all times parallel with the operating lever and thus reciprocate the saw.

4. In a tree pruning device, the combination of a pole, a lever, an arm projecting upwardly from one end of the lever, a pruning saw fixed to the end of said arm and having saw teeth on its opposite edges and extending from it in the general direction of the pole, two wire cables one connected with each end of the lever and located on one side of the pole, two sets of rollers for guiding said cables, one near the upper end and the other near the lower end of the pole, said cables crossing each other near the upper rollers and extending down to the lower rollers and then crossing each other again near the lower rollers, a lever pivoted near the bottom of said pole, the opposite ends of the lever being connected with the two cables to reciprocate the saw, and means for swinging said arm to move the saw to either side.

5. In a tree pruning device, the combination of a pole, a lever pivoted on said pole, an arm projecting upwardly from one end of the lever, a pruning saw fixed to the end of said arm and having saw teeth on its opposite edges and extending from it in the general direction of the pole, two wire cables one connected with each end of the lever located on one side of the pole and extending down, a lever pivoted near the bottom of said pole, the opposite ends of the lever being connected with the two cables, whereby the oscillation of the lever on its pivot will pull down first one cable and then the other and reciprocate the saw, and means for swinging said arm to move the saw to either side.

6. In a pruning device, the combination of a pole, a hook at the top thereof movable longitudinally on the pole and adapted to support the pole from a limb over which it is engaged, a lever pivoted on the pole, a double-edged pruning saw pivotally connected with one end of the lever, means at the bottom of the pole for swinging the lever to reciprocate said saw, a cross bar connected with the saw, a pair of flexible connections extending from the opposite ends of said cross bar down to the bottom of the pole, and means for adjusting said connections on said operating lever, whereby said flexible connections can be adjusted to swing the saw on its pivot to either side of a limb on which the hook is mounted.

7. In a pruning device, the combination of a pole, a hook on the pole adapted to support the pole from a limb over which it is engaged, a lever pivoted on the pole, a double-edged pruning saw pivotally connected with one end of the lever, a cross bar connected with the saw, a pair of flexible connections extending from the opposite ends of said cross bar down to the bottom of the pole, and means for adjusting said connections on said operating lever, whereby said flexible connections can be adjusted to swing the saw on its pivot.

8. In a pruning device, the combination of a pole, means for supporting the pole on a limb above, means for clamping the pole to the limb, a saw adapted to swing on a pivot, means for reciprocating said saw, and flexible connections from the clamping device and said saw extending down the pole, with means for holding said flexible connections to the bottom of the pole comprising a pivoted latch having a serrated edge for engaging the flexible connection and locating it in a position to clamp the connection more firmly as a force is exerted on it to pull it upward along the pole.

In testimony whereof I have hereunto affixed my signature.

LEON J. BARRETT.