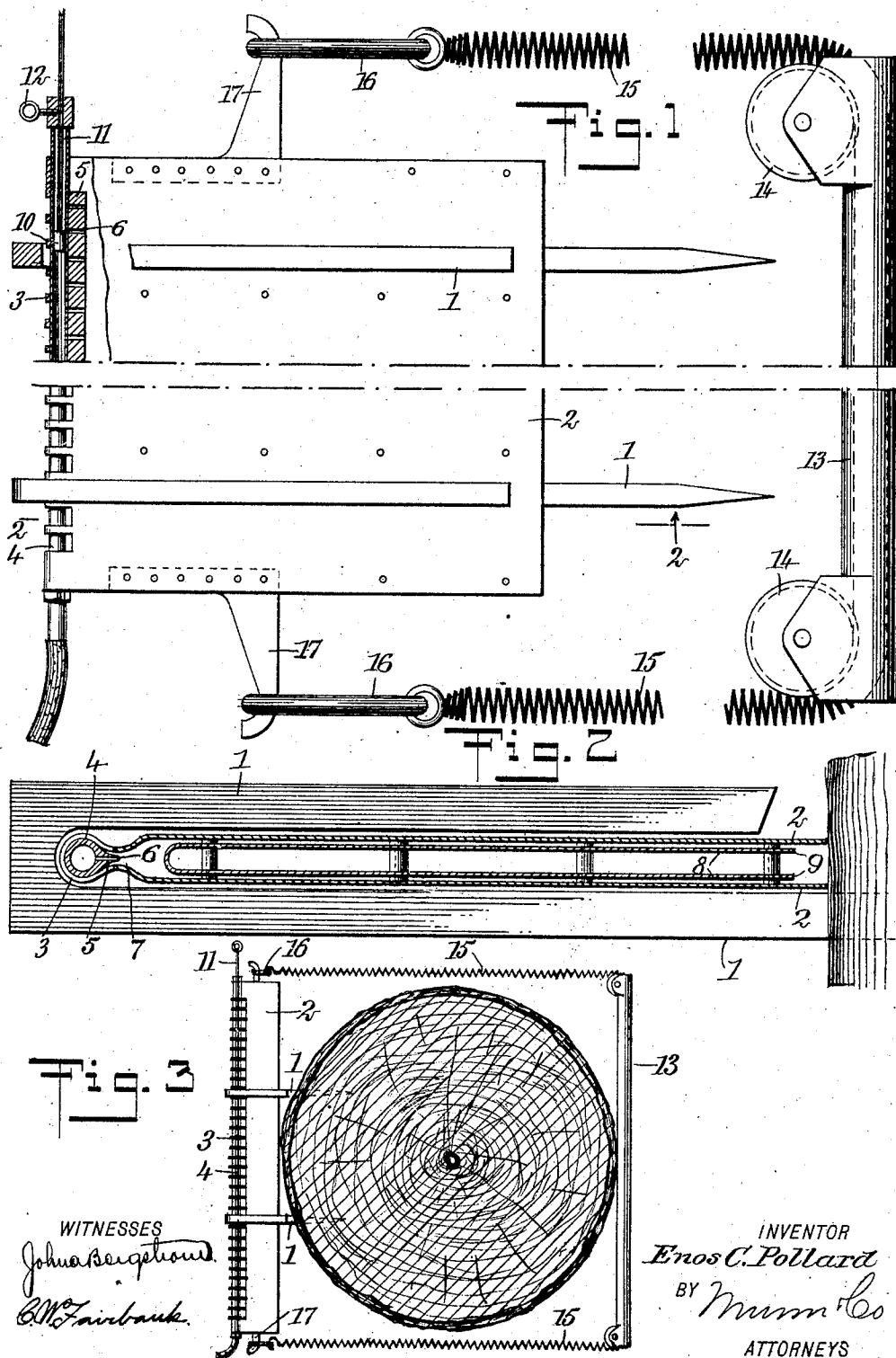


No. 850,848.

PATENTED APR. 16, 1907.

E. C. POLLARD.
TIMBER CUTTING DEVICE.
APPLICATION FILED JULY 26, 1906.



UNITED STATES PATENT OFFICE.

ENOS CAMPBELL POLLARD, OF SEATTLE, WASHINGTON.

TIMBER-CUTTING DEVICE.

No. 850,848.

Specification of Letters Patent.

Patented April 16, 1907.

Application filed July 26, 1906. Serial No. 327,853.

To all whom it may concern:

Be it known that I, ENOS CAMPBELL POLLARD, a citizen of the United States, and a resident of Seattle, in the county of King and State of Washington, have invented a new and Improved Timber-Cutting Device, of which the following is a full, clear, and exact description.

This invention relates to a device for cutting timber by burning a well-defined kerf through the log or tree, and more particularly relates to means for directing a blast of air to promote combustion and for preventing the timber from burning at other points than those required for severing it.

The operation of the apparatus depends upon the well-known fact that wood when once ignited will burn and become consumed so long as sufficient air is supplied to the ignited portion to support combustion. At the present time timber is sometimes felled by burning, holes being bored into the tree in such a manner as to produce a natural draft of air upon igniting; but this process is entirely too costly, as no means are provided for preventing the flames from spreading to other portions of the timber. There is therefore no novelty in the use of fire for the above purpose; but the novelty of this device resides in the employment of means for delivering a blast of air against the portion of the timber which it is desired to remove by burning and in confining the combustion to that particular section, so as to produce a narrow and well-defined groove or kerf.

The improved device may be employed for cutting down trees or may be employed for cutting logs into shorter sections. It is particularly economical in the first case, as the tree may be cut at a point closer to the ground than can be conveniently accomplished when the tree is cut down by sawing or chopping.

The device consists, essentially, of a long thin hollow plate subdivided into two or more compartments, one of which is employed for the exhaust-gases arising from the combustion and the remaining compartments for supplying air to the point at which it is desired to burn the timber.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a plan view of the apparatus,

certain portions thereof being broken away. Fig. 2 is a section on the line 2 2 of Fig. 1; and Fig. 3 is a plan view of the apparatus, showing the method of attaching the same to a standing tree.

For supporting the severing-plate and guiding it until a sufficiently deep kerf is formed there are employed two or more substantially U-shaped supports 1, having one end pointed and adapted to be driven into the tree and the other end extending above the severing-plate and holding it in position. These supporting and guiding pieces are separated from the device and do not constitute a portion of the burning device *per se*.

The hollow member constituting the essential portion of the invention comprises two thin plates 2, united together along one edge by a plurality of straps or bands 3, inclosing an air-delivering-pipe 4. The two plates are preferably bent together at a point adjacent the air-supply pipe to form a narrow passage communicating with the outside air through the spaces between the straps or bands 3. The pipe 4 is provided with a thin sharp blade or edge 5, having a plurality of outlet-passages 6 therethrough, by which the air is delivered under pressure from the pipe to the narrow passage-way 7. The force of the compressed air escaping through the passages 6 causes atmospheric air to enter the spaces between the straps 3 and pass along with the compressed air between the plates 2.

Between the two plates 2 there is provided a second plate, 8 bent double and having its edges 9 terminating a short distance from the edges of the outer plates 2. To hold the inner plate in position and properly space it from the outer plate, a plurality of rivets or bolts are employed, each having sleeves thereon and of the required length to hold the plates at the proper distance apart. The ends of these rivets or bolts are flush with the outer surface of the plates 2, so that they do not interfere with the insertion of the plate within the kerf or groove cut during the operation of the device. As shown, the plates 2 are formed from a single piece of metal, having straps or bands 3 formed by cutting out rectangular portions of the material, although it is evident that the two plates 2 may be formed from separate plates and have separate straps or bands 3 riveted or otherwise secured thereto to hold them in the desired relationship.

The inner plate 8 is preferably of thinner metal than the outer plate and may be corrugated in a direction at right angles to its length, so as to be self-adjusting to any unequal expansion from heat. The ends of the inner plate 8 are left open, so that the products of combustion may readily escape, while the space between the inner plate 8 and the outer plate 2 is preferably thinner than the space between the plates 8 and serves as the air-delivering passage.

To control the escape of air from the air-delivering pipe 4, so that the device may be employed for cutting larger or smaller logs, a piston 10 is provided in the pipe 4, and this piston may be moved to any desired position or held there by means of the rod 11 and set-screw 12.

For keeping the plate continuously in contact with the surface to be burned any suitable spring or weight-controlled device may be employed. In the form illustrated in the drawings there is provided a pipe 13, having pulleys 14 adjacent each end thereof and a coiled spring 15 extending through the pipe and over the pulleys. This pipe 13 is placed on the opposite side of the tree from the severing-plate, and the ends of the coiled spring are provided with rings 16, adapted to be secured to the hooks 17 on the severing-plate. As soon as a portion of the tree or log has been burned away the spring automatically forces the plate farther into the groove or kerf which has been burned, and thus automatically controls its operation.

In the employment of the improved device above described a little oiled waste or other suitable kindling is inserted in the space or chamber between the opposite plates of the blade, and the latter is placed horizontally against the trunk of the tree on the side toward which the tree is to be felled, and the guides 1 are driven into the trunk of the tree to hold the blade in place. The pipe 13 is placed on the opposite of the tree-trunk, and the rings 16 on the ends of the coiled spring are drawn forward and engaged with the lugs or hooks 17, the entire device being in the relative position in respect to the tree-trunk clearly shown in Fig. 3. The oiled waste is then ignited, and compressed air is delivered through the pipe 4 from any suitable source of supply. The air under the desired pressure escapes through the orifices 6 and acts as an injector to draw more air from the atmosphere and force the same through the passage between the inner and outer plates. The air being delivered to the ignited kindling serves to direct the flame against the trunk of the tree and ignite the latter. As soon as the tree becomes ignited the combustion is maintained under the forced draft, and the products of combustion escape through the space between the inner plates 8 and out through the

open ends. As the wood in front of the blade is consumed the blade is drawn forward by the spring 15, thus always directing the air against the face of the kerf and shutting the air off from the top and bottom of the kerf, thereby extinguishing the fire at those points. The cold air coming continuously through the passage between the inner and outer plates serves to keep the outer plate cool and facilitates the extinguishing action. The flame passing outward from the central portions of the blade, where the air is directed against the drier central portion of the tree, serves to heat the wood near the inner surface of the tree, which is usually greener and less readily combustible, and thus facilitates combustion at this greener portion. The flame also serves to heat the blast of incoming air, and thereby intensifies the combustion.

When the kerf has been burned to a depth which will vary somewhat in individual cases, but which in particularly straight or perpendicular trees will be about the center of the trunk, the air is turned off, and the relative positions of the blade and the pipe 13 are reversed. This allows the tree to settle in the direction in which it is to fall by the width of the kerf. The operation is now repeated as before, the blade progressing in the direction in which the tree is to fall, thus avoiding danger of injury to the blade by the falling tree. The pipe 13 may be sunken into a notch cut in the tree-trunk, so that it will not be injured by the tree in falling.

In cutting logs into shorter lengths after the tree has been felled the blade is simply placed with its cutting edge against the top of the log and at right angles to it and held in position by the guides 1, driven into the top of the log. Instead of employing the pipe 13 and spring 15 for forcing the blade into the burned kerf in this case weights may be merely hung upon the lugs 17. The operation is the same as for felling trees, except that the log is cut entirely in two at one operation. In clearing land of stumps the device may be similarly placed on top of a stump and a vertical kerf or groove burned therein. Any number of such kerfs may be then cut in the stump, which upon being fired will burn to the ground, the kerfs furnishing a flue which creates a natural draft. Stumps of resinous trees treated in this manner will burn until entirely consumed, even to a short distance below the surface of the ground.

The advantages of this device are that it substitutes a cheap form of power for high-priced skilled labor in felling timber and that it renders it possible to cut trees close to the ground, thereby saving much valuable timber which is now wasted on account of the tall stumps left standing because of the en-

larged butt and the great amount of resin in this butt, which in sticking to the saw renders its progress too slow to be economical.

The plant needed for the successful operation of this system on a large scale will consist of an air-compressor, either stationary or portable, a pipe of the diameter and strength necessary to transmit the desired quantity of air from the compressor to the work, and any number of the above-described cutting devices. Ordinarily the compressor will be coupled to an oil or gasoline engine on one base, and this base may be bolted onto a plank platform and may be moved from place to place on a suitable truck or sled.

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

1. A device for burning kerfs or grooves into logs, comprising a hollow plate having a plurality of passages therethrough, means for delivering air to one of said passages, and permitting the escape of the products of combustion through another of said passages.

2. A device for burning kerfs or grooves into logs, comprising a hollow plate having a plurality of passages therethrough, a pipe for delivering air to one of said passages, said pipe being provided with a plurality of apertures, and means for shutting off the supply of air to certain of said apertures.

3. A device for burning kerfs or grooves into logs, comprising a hollow plate, open along one edge and having a plurality of apertures along its opposite edge, a pipe within said plate, adjacent its apertured edge, and provided with discharge-passages, and means for conducting compressed air to said pipe.

4. A device for burning kerfs or grooves into logs, comprising a hollow flat plate, means for supplying compressed air to said plate, guides for said plate, adapted to be secured to the log, and a coiled spring extending around the log and having its ends secured to said plate.

5. A device for cutting a kerf into timber by burning, comprising a hollow flat plate, and means for delivering compressed air to the interior of said plate and permitting the escape thereof from said plate against the material to be burned.

6. A device for cutting a kerf into timber by burning, comprising a hollow plate having an elongated delivery-outlet, means for conducting compressed air to the interior of the plate and permitting the escape thereof through said elongated outlet against the material to be burned, and means for automatically feeding the plate into the timber as the latter is burned away.

7. A device for cutting a kerf into timber by burning, consisting of means for delivering a blast of air against the portion to be burned, projections on the sides of said air-delivering means, a tube adapted to be supported parallel to the air-delivering means and upon the opposite side of the timber, friction-rollers adjacent the ends of said tube, and a spiral spring extending through said tube and having the ends thereof secured to said projections, said spring serving to automatically and continuously keep the air-delivering means in contact with the wood as the latter is burned away.

8. A device for cutting a kerf into timber by burning, comprising two parallel plates, means for delivering air between said plates along one edge, means for supporting said plates with the opposite edge in contact with the timber to be burned, and resilient means adapted to encircle the timber and automatically keep the plates in contact with the timber and deliver the blast of air against the portion to be burned.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ENOS CAMPBELL POLLARD.

Witnesses:

W. B. DICKINSON,
E. B. MORELOCK.