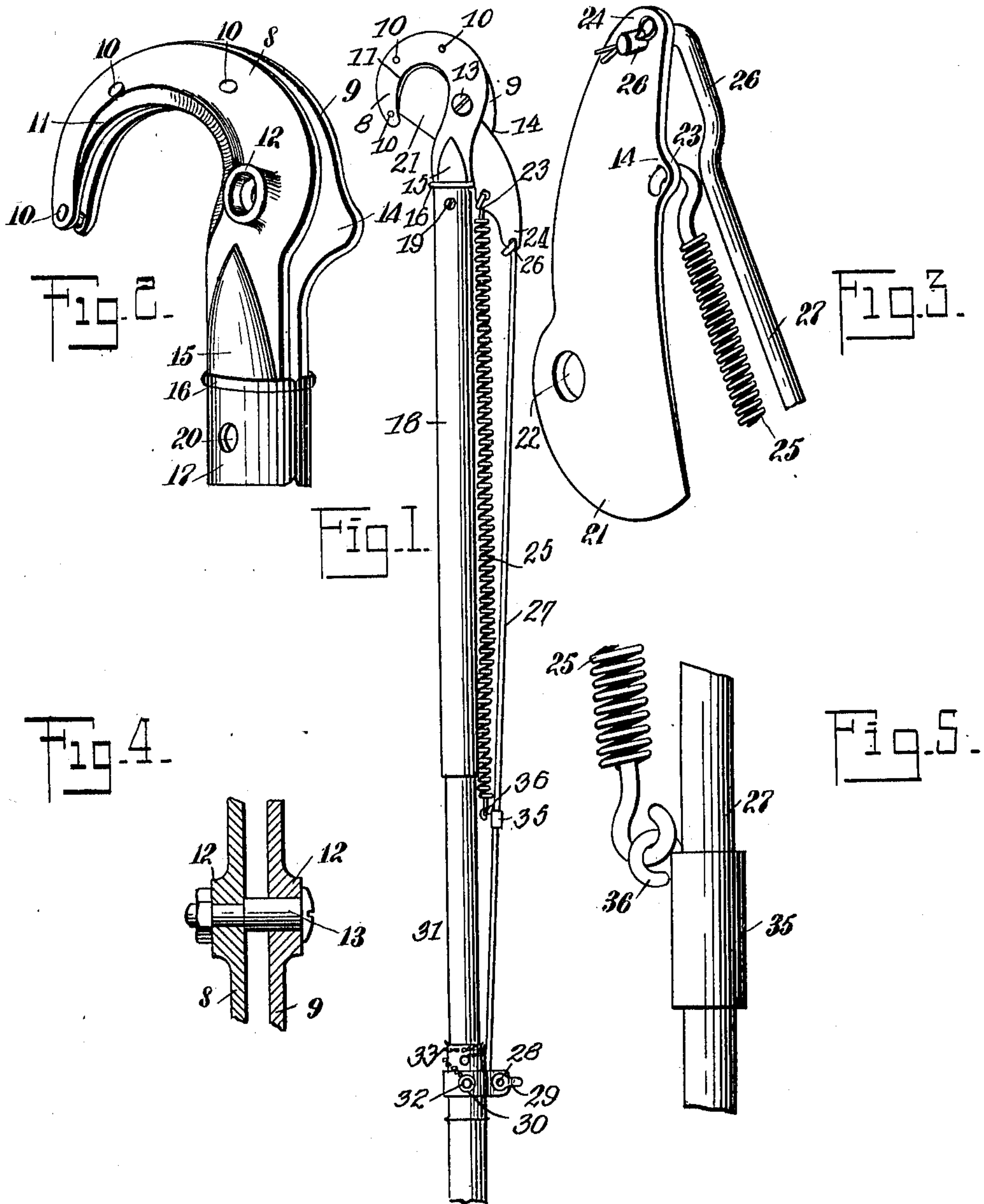


F. A. FRUMVILLER.
PRUNING KNIFE.
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978,574.

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FRANK A. FRUMVILLER, OF DETROIT, MICHIGAN.

PRUNING-KNIFE.

978,574.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, FRANK A. FRUMVILLER, a citizen of the United States, and a resident of Detroit, in the county of Wayne and State of Michigan, have invented a new and Improved Pruning-Knife, of which the following is a full, clear, and exact description.

Among the principal objects which the present invention has in view are: to provide an implement of the character specified wherein the pull on the implement is converted into a cutting force; to provide an implement of the character specified wherein the wear incident to the cutting strain is provided for; to provide a construction wherein the shredding of the bark from limbs being severed is overcome; to provide a construction wherein the cutting strain introduced upon the blade is balanced; and to provide a construction which is light, durable and simple in arrangement and operation.

One embodiment of the present invention is disclosed in the structure illustrated in the accompanying drawings, in which like characters of reference denote corresponding parts in all the views, and in which—

Figure 1 is a side view of a pruning knife constructed and arranged in accordance with the present invention, and shown in its closed position. Fig. 2 is a detail view in perspective of the bill hook of the present pruner; Fig. 3 is a detail view in perspective of the knife; Fig. 4 is a fragmentary detail view in vertical section of the bill hook, the section being taken through the pivot line of the knife and the bill hook; and Fig. 5 is a detail view in perspective of the anchorage for the resetting spring.

Heretofore the ordinary pruning knife, in the majority of instances, consists of a single stationary blade upon which is mounted in wiping contact a pivoted cutting blade, the action being similar to that known as a shearing action. The cutting has principally depended upon the alinement or wipe of the cutting edges and this has been maintained by a suitable pivot. The natural wear has resulted in the loosening of the cutting blade upon the pivot or in the bending of the pivot under operation. In every instance the cutting edges of the two blades flare to a greater or less extent, permitting the shredded end of the limb being cut, or the bark of the same, to extend between the

cutting blades forming a hanging member for the limb being severed. This partial failure to sever the limb has caused a great deal of trouble in that the bark constituting the hanging member is difficult to engage between the cutting members. It is to overcome such an objection that I have provided the present head, consisting of a bill hook which consists of two pieces 8 and 9. The two pieces 8 and 9 of the bill hook are given the ordinary crook shape common to implements of this character and are maintained in their separated relation by rivet bolts 10, 10. The member 8 forming the bill hook is provided with a stationary shear or cutting edge 11 against which the squared side of the knife sweeps. The member 9 of the bill hook is raised slightly above the cutting edge of the member 8 and is provided with a lower edge more square in form, against which the limb or twig rests while being cut. The cutting edge 11 is reinforced by being thickened in cross section, as shown in the drawings, and provided with a beveled sharpened side. Both parts are bossed outwardly to form elongated bearings 12 for pivot bolts 13. The member 9 is extended to the rear to form an offset 14 which operates as a guide for the knife in its initial cutting position. Both members are provided with reinforcing projections 15 and annular half-flanges 16. The half-flanges 16 are set out from half-tubes 17 of which they form an integral part. The half-tubes 17 are adapted to extend within the upper end of the casing 18 and to be therein held by a suitable screw bolt 19 which extends through perforations 20 formed in the said half-tubes 17, forming in such relation a rigid structure.

The blade 21 is secured in the bill hook by being inserted between the members 8 and 9 so that a perforation 22 formed in the said blade alines with the perforations in the bearings 12. In such position the pivot bolt 13 is introduced, passing through both the perforation in the bearings 12 and in the blade 21. The blade 21 differs from the ordinary blade in that it is provided with extensions 23 and 24. The extension 23 is set out from the rear end of said blade and is perforated to receive the upper end of a spring 25. The extension 24 is provided to receive a hook end 26 of a pull rod 27. Both the pull rod 27 and the spring 25 are so disposed with reference to the blade 21

that when the parts are assembled the median line of the said rod and spring coincides with the median line of the blade 21 whereby the pull strain exerted by the said rod 27 and spring 25 is directed evenly upon the pivot bolt 13, producing no canting strain on the said blade.

It is by means of the pull rod 27 that the blade 21 is swung in such manner as to sever the limb or twig for which the pruner is constructed. To accomplish this the lower end of the said rod is hooked about a pin 28 and extended through ears 29 set out from a collar 30. The collar 30 is provided with outwardly turned edges whereby the same slides more freely on a handle 31. The collar 30 is normally held in position by a bolt or cotter pin 32 which is attached to the loose end of a chain 33 provided to prevent the said pin from becoming detached and possibly lost. The chain 33 is sufficiently long to permit the introduction of the pin 32 within perforations 34 extended through the lower end of the casing 18 and the handle 31, in which position certain actions transpire to be hereinafter explained.

When the collar 30 is fixedly mounted in position upon the handle 31 by means of the bolt 32, and the rod 27 is connected thereto, the pruning implement is in condition to operate. This operation is as follows: In its retracted position the casing 18 and bill hook connected therewith rests upon the collar 30. In this position the rod 27 elevates the extension 24 of the blade 21 so that the cutting edge of the blade is retracted within the members 8 and 9, as shown in Fig. 1 of the drawings. The bill hook having been placed through the branch it is desired to sever the handle 31 is pulled downward. The bill hook and casing 18 being held by the branch, the pulling strain is exerted through the medium of the collar 30 and the rod 27 directly upon the blade 21. This pull rotates the said blade about the pivot bolt 13 and closes the blade 21 upon the extended ends of the bill hook and inserts the same between the members 8 and 9 thereof. In this manner the interposed branch or twig is severed.

The spring 25 operates to reset the blade 21 in the open position. It accomplishes this by being attached to the rod 27 by means of a collar 35 secured upon the said rod. The exertion of the spring 25 is such that it compels the rod, spring and blade to assume the position shown in Fig. 1 of the drawings, for the reason that it is in that position that the said spring is extended least. In the positions shown in Figs. 2 and 3 of the drawings the spring is extended, from which position they are drawn from the direction of the spring. The attachment between the spring 25 and the collar 35 is by means of a hook 36.

The cutting operation has been above described. When the spring 25 is incorporated as an element in the implement the blade 21 is reset to the cutting position shown in Fig. 1 of the drawings whenever the strain on the handle 31 is released.

When employing this implement in the operation of cutting small twigs or branches not having resistance sufficient to maintain their position under the pull of the handle when cutting, I prepare the implement by extending the casing 18 sufficiently to align the perforations 34 with the perforations provided in the handle 31, and then inserting the bolt 32 through the perforations 34 and handle 31, holding the said casing and handle as a single rigid member. The pin 32 is withdrawn from engagement with the handle 31, and to it is attached a flexible cord or cable 37, as illustrated in Fig. 3 of the drawings, this being sufficiently stout to give the desired cutting pull on the rod 27 to close the blade 21 upon the interposed twig or branch. In this latter operation the method differs only in that when the bill hook 8, 9 is placed over a branch or twig instead of pulling upon the handle 31 this is maintained in fixed position while the pull is exerted upon the cord or cable 37, thus operating to swing the blade 21 upon its pivot bolt 13 and close the cutting edge of said blade against the members 8, 9. In this operation, the double membered bill book, it will be observed, supports or holds in preferred position for cutting the interposed twig or branch, the member 9 supporting the free or to be severed portion of the said branch or twig, while the member 8 serves as a stationary member for the operation of the cutting blade 21.

It will be observed that throughout the operations above described the pull of both the rods 27 and spring 25 in their respective actions upon the blade 21 have been central to the pivot bearing of the said blade. This produces an even wear upon the said bearing. It also produces a construction where, in the event of a wear, the blade would still be rotated in a central manner.

The collar 35 may be secured upon the rod 27 in any suitable manner, that preferred by me consisting in locating the same in preferred position and then contracting the section or point thereof to take positive hold upon the said rod. One method of doing this would be to strike the collar with a prick punch or common nail set. At any time, by driving lightly the collar 35 may be placed lengthwise of the rod 27 to increase or diminish the expansion strain of the spring 25.

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

A pruning knife, comprising a bill hook having a plurality of parallel separated

hook-like members each provided with a laterally extended boss, said bosses being perforated in line to form bearings, one of said hook-like members having formed on the inner curved edge thereof a cutting edge, the
5 other of said members having a squared inner curved edge; a guide extension formed on the member having the said squared edge, said guide extension projected at the side of
10 said extended bosses opposite to the extension of the said hook-like member; a pivot member extended through said perforations formed in said bosses; a guiding blade pivotally mounted on said pivot member and

having a wide rearward extension disposed in line with the said guide extension, said
15 blade passing between the said hook-like members; and means connected with said rearward extension for rotating the said
20 blade into cutting relation with the said hook-like members.

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

FRANK A. FRUMVILLER.

Witnesses:

LOUIS F. LINSEL,
MARY E. KLOSTER.