March 16, 1937. W. RUSH 2,074,239

HAND TOOL

Filed April 4, 1936

Fig. 1.

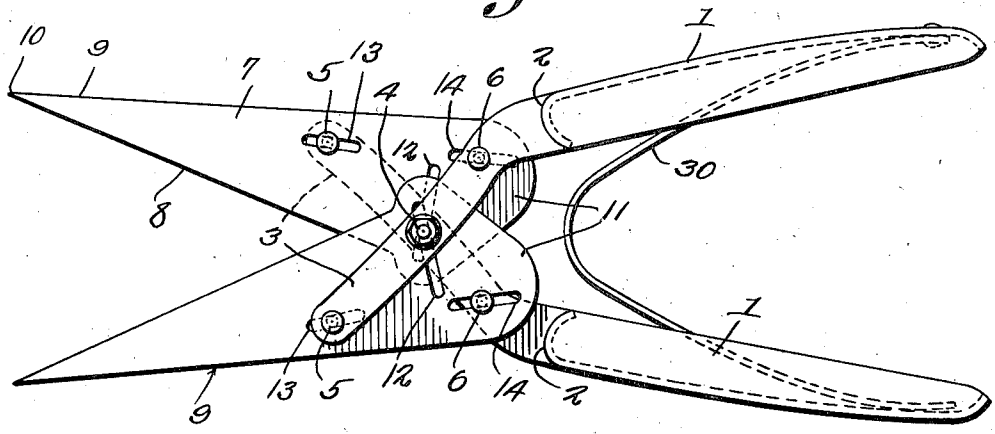


Fig. 2.

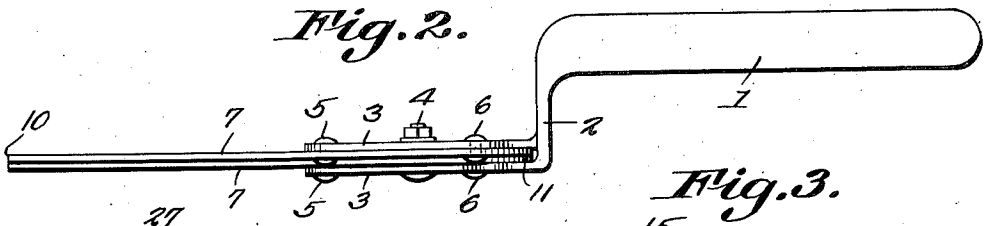


Fig. 3.

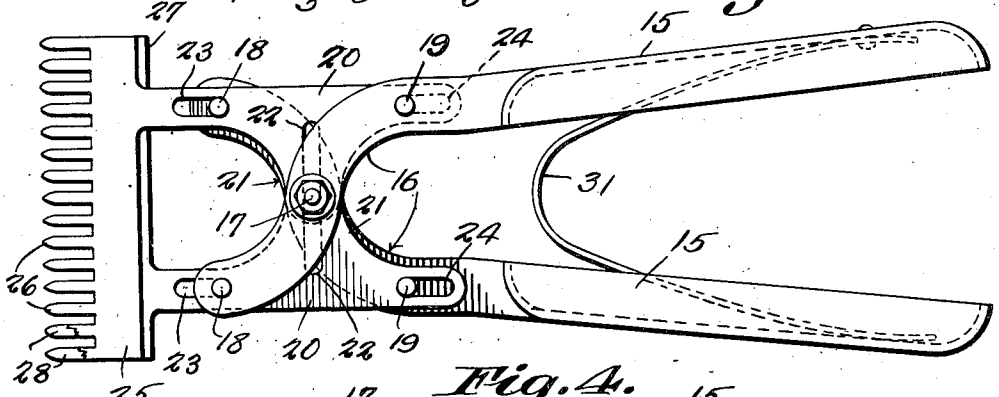


Fig. 4.

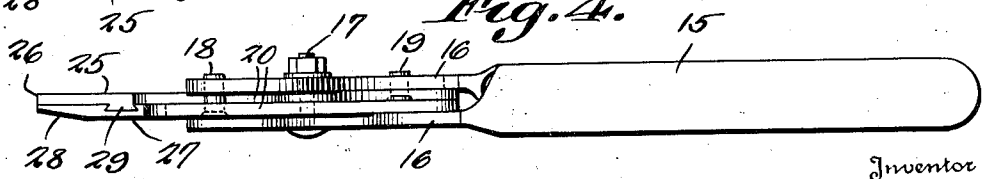
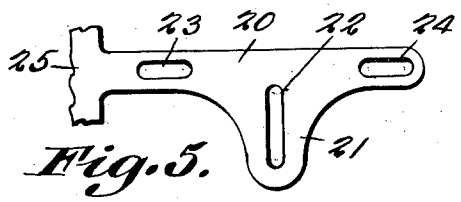


Fig. 5.



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HAND TOOL

William Rush, Washington, D. C.

Application April 4, 1936, Serial No. 72,818

4 Claims. (Cl. 30—11)

This invention relates to hand tools and while the present improvements are designed more particularly for use in connection with pruning shears, it is to be understood that they are adaptable also to scissors, tailors' shears, clippers, etc.

An object of the invention is to provide an implement of this character utilizing floating blades which, although actuated by the usual crossed handles, are free to slide relative to each other and to the handles when the pivotally connected handles are actuated.

Another object is to provide an article of this character which does not require the use of links but, on the contrary, is of simplified construction and can be produced at low cost.

With the foregoing and other objects in view which will appear as the description proceeds, the invention consists of certain novel details of construction and combinations of parts hereinafter more fully described and pointed out in the claims, it being understood that changes may be made in the construction and arrangement of parts without departing from the spirit of the invention as claimed.

In the accompanying drawing the preferred forms of the invention have been shown.

In said drawing

Figure 1 is a plan view of one type of shears having the present improvements.

Figure 2 is a side elevation.

Figure 3 is a plan view of another form of the invention.

Figure 4 is a side elevation thereof.

Figure 5 is a detail view of one of the floating elements of the modified structure.

Referring to the figures by characters of reference 1 designates opposed handles which can be of any desired construction and design. In the present case, as illustrated in Figures 1 and 2, the handles are offset at one end, as shown at 2, these offset portions merging into flat arms 3 which cross adjacent to their centers and are pivotally connected at their point of crossing by a bolt 4 or the like.

Extending downwardly from the upper arm 3 are studs 5 and 6, the stud 5, which is adjacent to the free end of the arm, being farther removed from the pivot 4 than is the stud 6. The other or lower arm 3 is also provided with studs 5 and 6 extending upwardly therefrom and similarly positioned.

The cutting elements comprise two opposed blades 7 which are duplicates but oppositely arranged. Each of these blades has its cutting edge 8 converging at an acute angle toward the outer side edge 9 forming a point 10 at one end while the other end of the blade is broad as shown at 11. The broad base portions 11 of the two blades lap at their inner sides and each of them has a transverse slot 12. These slots in the two blades are crossed and pivot 4 extends through them at the point of crossing, it being understood that the blades have their lapping portions interposed between the arms 3.

Formed in each blade adjacent to its outer side edge 9 are spaced slots 13 and 14. Studs 5 extend into the slots 13 while studs 6 extend into the slots 14.

It will be noted that each slot 12 is positioned substantially at right angles to the slots 13 and 14 in the same blade. It will be noted further that the slots 14 are closer to the slots 12 than are the slots 13. This arrangement of slots together with the location of the studs 6 nearer pivot 4 than the studs 5 produces a peculiar swinging and sliding movement of the blades or floating members 7 when the handles 1 are swung relative to each other. For example when the handles 1 are drawn together the studs 5 will move toward each other at one speed while the studs 6 will move toward each other at a slower speed. This will result in rotating the blades relative to each other while at the same time the studs will thrust against the inner sides of their slots and cause the blades to slide relative to each other. Thus the cutting edges will press into and draw along the object being sheared and the result will be a quick and clean cut. As the blades are simultaneously slid and swung toward each other by the peculiar lever and slot arrangement shown, less power is required to sever an object than should the blades be made a part of or fixedly joined to the respective handles as in ordinary shear constructions.

While it is generally desirable to use blades capable of rotating relative to each other, the present improvements can, nevertheless, be adapted to reciprocating cutting elements. Such a structure has been shown in Figures 3, 4 and 5. In this form of device the opposed handles 15 have crossed arms 16 joined at their point of crossing by a pivot bolt 17 or the like. Extending downwardly from the upper arm 16 are studs 18 and 19 which, in the present instance, are equidistant from the pivot 17. Other studs 18 and 19 similarly positioned are extended upwardly from the lower arm 16.

The floating elements in this modified construction are in the form of plates 20 located

between the arms 16 and oppositely disposed. Each of these plates has a laterally extended portion 21 provided with a slot 22 extended transversely of the plate. The portions 21 lap and the slots 22 therein both receive the pivot member 17.

Formed in each plate 20 are longitudinal alining slots 23 and 24 equidistant from the slot 22 in said plates. Slots 23 receive the studs 18 while slots 24 receive the studs 19.

Formed with or suitably connected to one of the floating members 20 is a laterally extended shearing element in the form of a slide 25 having a series of forwardly extended cutting teeth 26. Another shearing element in the form of a slide 27 is extended laterally from the other floating member 20 and is formed with teeth 28 designed to cooperate with teeth 26, it being understood that the two slides 25 and 27 overlie and extend in opposite directions respectively from their plates 20. They can also be guided one upon the other by a tongue and groove connection as indicated at 29.

In the structure shown in Figures 3, 4 and 5 the arms 16 will rotate on pivot 17 when the handles 15 are moved toward or from each other. As the studs 18 and 19 are equidistant from pivot 17, this swinging action will result in moving the floating members or plates 20 toward or from each other without rotating. Consequently the cutting elements or slides 25 and 26 will have a right line movement and be reciprocated so that any objects entering between the teeth on the two slides will be severed.

It will be noted that in both of the illustrated forms springs 30 and 31 respectively have been interposed between the handles to cause them to move apart when released from the grip of the user. In some forms of the invention, however, these springs may be eliminated. It will also be understood that the shapes of the handles can be changed and in the smaller articles, such as scissors, the handles can be formed with the usual finger-receiving eyes.

Another feature of importance is found in the fact that in both illustrated forms some of the parts are duplicates so that it is not necessary to make "rights" and "lefts". For example the blades 7 shown in Figure 1 are duplicates while the handles 15 and their arms shown in Figure 3 are also duplicates. By eliminating the guide 29, the floating elements 20 with their slides 25 and 27 can also be duplicates. Thus the cost of producing this article is materially reduced.

What is claimed is:

1. An article of the class described including opposed floating elements having cooperating work engaging portions, portions of said elements being disposed in lapped relation and transversely slotted, there being a pair of longitudinal slots in each of said elements, opposed handles having crossed arms, said elements being extended between the arms, a pivot device connecting the arms at their point of crossing and extending through the transverse slots, and separate means on each arm for sliding engagement within one of the slots of each of the respective pairs of longitudinal slots in the floating elements.

2. An article of the class described including opposed duplicate floating elements having cooperating work engaging portions, said elements being disposed in lapped relation and having transverse slots in their lapping portions, there being a pair of longitudinal slots in each element, handles having crossed arms, said elements being positioned between the arms, a pivot device connecting the arms and extending through the transverse slots, and means on the arms engaging the longitudinally slotted portions of the elements and positioned equidistant from the pivot device to slide said elements relative to each other along straight lines during the relative pivotal movement of the handles.

3. An article of the class described including opposed duplicate floating elements having cooperating work engaging portions, said elements being disposed in lapped relation and having transverse slots in their lapping portions, there being a pair of longitudinal slots in each element, handles having crossed arms, said elements being positioned between the arms, a pivot device connecting the arms and extending through both of the transverse slots, and separate means on the arms engaging the longitudinally slotted portions of the elements and positioned relative to the pivot device to slide said elements bodily toward each other and backwardly toward the pivot device during the relative movement of the handles.

4. An article of the class described including crossed members pivotally connected, a work engaging element carried by one of the members, and a floating work engaging element carried by the other member, said floating element having a transverse slot, a pivot device connecting the members and extending through the slot, there being a pair of longitudinal slots in said floating element, and separate means on the members and engaging in the respective longitudinal slots of the floating element, said separate means being so positioned relative to the pivot device as to slide said floating element bodily toward the opposed element and backwardly toward the pivot device during the relative movement of the members.

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