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GRASS SHEARS HAVING PUSH MEANS FOR ACTUATING A BLADE THEREOF

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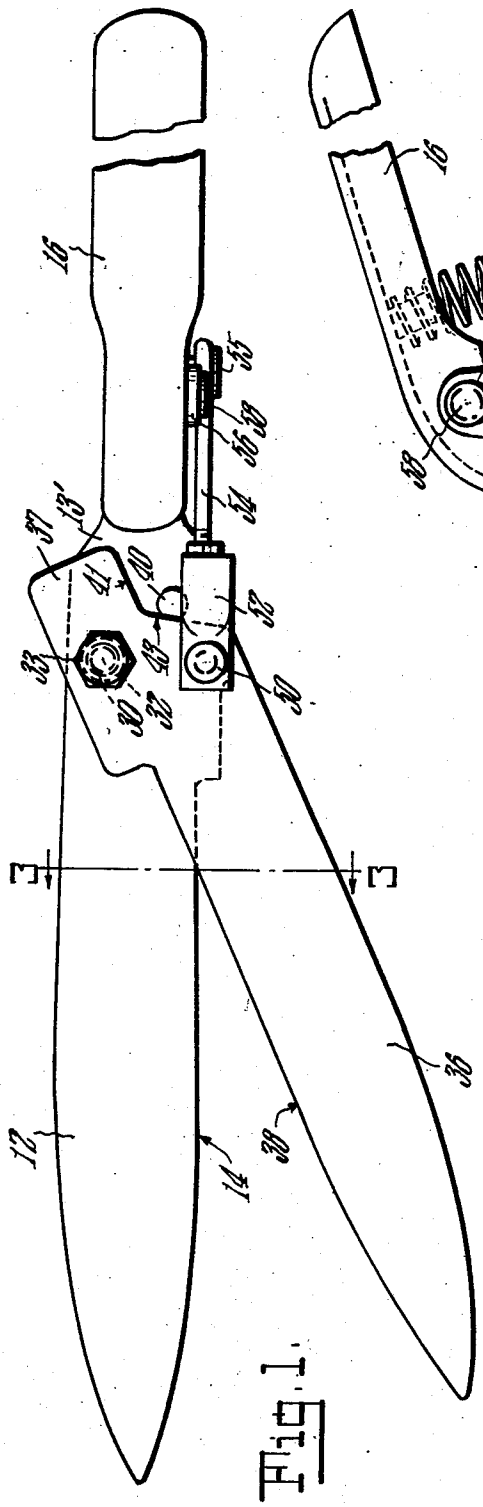


Fig. 1.

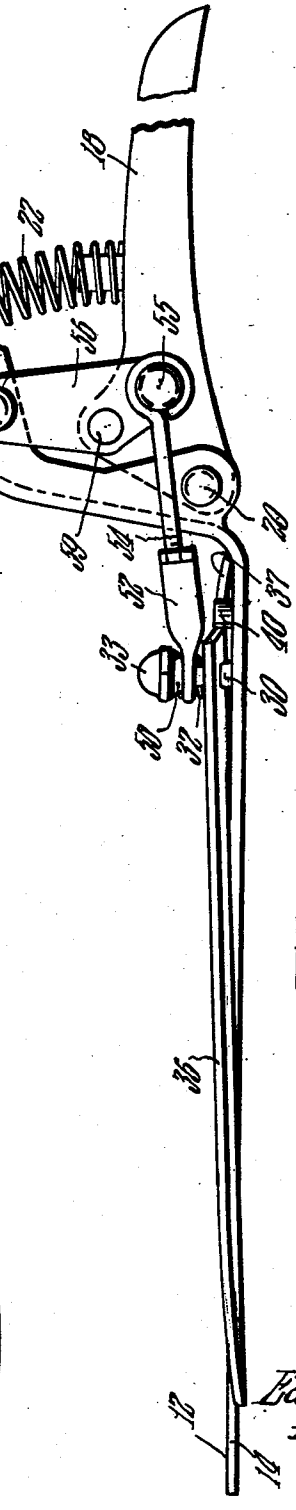


Fig. 2.

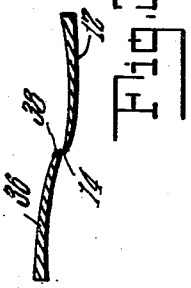


Fig. 3.

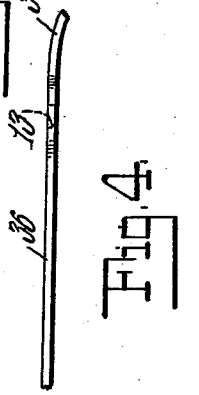


Fig. 4.

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GRASS SHEARS HAVING PUSH MEANS FOR ACTUATING A BLADE THEREOF

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3 Claims. (Cl. 30—248)

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My invention relates to new and useful improvements in shears and is more particularly directed to the provision of an improvement in swingable connections of the components of shears commonly known and referred to as clipper shears.

It is the principal object of my invention to provide non-binding cooperating pressure engagement between the cutting edges of the blades when same are brought together in closing relation.

In prior art devices of this type, one of the cutting blades has been fixed and the other has been rendered movable relative thereto. The construction of my invention constitutes an improvement over known prior art constructions, however, in the important respect that, basically speaking, I employ a propelling or pushing action for the cutting operation whereas the earlier known constructions employ a pulling action. That is to say, by means of my construction, it is only necessary to swing one operating handle member toward the other in order to create a mechanical propelling or pushing wherein the main effort is exerted directly in the form of a pushing action rather than indirectly in the form of a pulling action.

One of the primary purposes of my invention is to provide structural and operational improvements in devices of the class to which reference has been made, which improvements not only simplify the structure as such, but also provide important distinct advantages in operation, strength, durability, life of cutting edges, and the like.

Another important object of the invention is the provision of means to maintain the blades in relatively canted relation for the cutting or shearing action and the same is enhanced as forces are applied for the said cutting or shearing.

A further feature of my invention is the provision of a construction having no side appurtenances extending outwardly therefrom which might interfere with the use of the tool, particularly in confined or restricted areas.

Within the above primary objects in view, it is still another object of my invention to provide a construction of the above described character in which the number of operating parts is reduced and which is compact in accordance with the demands and desires of manufacturers and purchasers alike and which is not only distinctive in its appearance and practical in its value but also reliable in its operation and efficient in its use.

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Other prime objects of my invention include: first, the securement of a higher degree of accuracy and greater degree of variety in the manner of work performed therewith than has heretofore been possible with prior devices known in the art; second, the attainment of a higher speed of construction and assembly of the device due to its simplification of design and its unique composition of parts; and third, the provision of such other improvements in and relating to shears of the type above referred to as are hereinafter described and claimed.

All of the above objects I accomplish by means of such structure and relative arrangements of parts thereof, as will fully appear by a perusal of the description below and by various specific features hereinafter set forth.

To the above cited and other ends and with the foregoing and various other novel features and advantages and other objects of my invention as will become more readily apparent as the description proceeds, my invention consists in certain novel features of construction and in the combination and arrangement of parts as will be hereinafter more particularly pointed out in the claims hereunto annexed and more fully described and referred to in connection with the accompanying drawings wherein:

Fig. 1 is a top plan view of the device of my invention;

Fig. 2 is a side elevational view of the device shown in Fig. 1;

Fig. 3 is a sectional elevational view on the line 3—3 of Fig. 1; and

Fig. 4 is an edge view of the rear portion of the movable blade of the shear shown in Figs. 1 and 2.

In the following description and claims, various details will be identified by specific names for convenience; these names, however, are intended to be as generic in their application as the art will permit.

Referring now to the drawing more in detail and in which similar characters of reference indicate corresponding parts in the several figures and referring more particularly to the preferred form of my invention selected for illustrative purposes, I have shown a fixed or stationary blade construction 12 having a cutting edge 14. The blade 12 has an upwardly extending portion at the rear end thereof and a manually engageable upper handle portion 16 disposed in a plane above the plane of the blade 12.

A lower movable handle member 18 is pivotally

connected at 20 to the first mentioned blade and handle 16 and is biased by spring 22 against closing together movement relative thereto. The handles are relatively swingable between open and closed position in accordance with the swinging of the blades between closed and open positions as will appear.

The fixed blade member 12 carries a pivot stud 30 which extends upwardly therefrom. A movable blade member 36 has a cutting edge 38 and is provided with an opening 13 receiving said stud, see Fig. 4. A spring member 32 surrounds the stud 30 and is held under more or less compression by a cap or nut 33 on the upper end thereof.

As shown, more particularly in Fig. 3, the blades 12 and 36 have inner concave faces.

The rear end or heel 37 of blade 36 inclines downwardly, see Fig. 1. This heel rides on an upper rear portion 13' of the blade 12 as the blades swing relative to one another. The stud 30 is disposed in more or less alignment with the cutting edge 38 of blade 36 or rearwardly thereof and adjacent the back edge of the blade 12. With the heel 37 on the part 13' of blade 36 and by the action of spring 32, the blade 36 is caused to cant or tilt relative to the blade 12 for the desired cutting or shearing action of the cutting edges of the blade.

A stop member 40 is fixed to blade 12 in an upwardly extending manner so as to be engageable by edges 41 and 43 of the blade 36 to limit movements of said blade 36.

The movable blade 36 carries an upwardly extending pivot or pintle 50 which pivotally receives a forward end member 52 which is threadedly and adjustably connected to a rod-like member 54. The opposite extremity of the rod 54 may be shaped as desired so as to be swingably engageable with a pin 55 of the lower end of the link 56.

Said link member 56 is pivotally connected to handle member 16 at its upper end and intermediate its ends it is pivotally connected to the lower handle at 59.

Other forms of pivotal connections may be employed to facilitate relative pivoting or swinging of the components. Such as are shown are for illustrative purposes only. In another form, the blade 36 could be provided with an upturned end portion which could be engageable with the member 52 so as to make possible the elimination of the pivot 50. Likewise, in lieu of the member 50 in its present illustrated form, a yoke arrangement could be substituted therefor.

Member 54 will be referred to as a propeller or pusher as, in the operation of the shear, it functions with the swingable connections to propel or push and exert force rather than function with a pulling action.

As handle member 18 is urged upwardly toward member 16, the lower end of member 56 is urged forwardly to the left whereby the member 54 and member 52 integral therewith is driven in that direction against blade 36 to swing it towards blade 12.

The propeller or pusher acting on the blade with a pushing action results in ease in operation. As the blade 36 swings towards blade 12 the relative cant of the blades is maintained by heel 37 of blade 36 traversing portion 13' of blade 12 in cooperation with the spring 32. The connections propelling the blade 36 are arranged and adapted to assist and enhance the blade cant thereby to obtain the desired cutting and shearing action whereby the contact of the cutting edges moves along the blades outwardly during the cutting operation.

Reverse movement of the blade 36 is provided for by the bias of spring 22 whereby the reverse action involves a pulling of the blade 36 away from the blade 12.

That is to say, the propeller or pusher acts to supplement the downward and canting force of the spring member 32. It will be appreciated that in the operation of the shears, the pushing action of the pusher, acting through member 50, moves blade 36 in a plane substantially horizontal to the plane of blade 12, the blade edges being held in yielding contact by the action of spring 32 in conjunction with the blade heel.

When an object which offers little resistance is to be cut, such as grass or the like, the blades are in light contact an the shears work with a minimum of friction and effort. When an object of considerable resistance is to be cut, the pushing action of the propeller acts to increase the shearing pressure in two important respects. Firstly, the blade 36 is canted with respect to the blade 12. Secondly, the blade 36 is forced downwardly against the blade 12. These two actions promote positive cutting action and resist the tendency of the blades to spring apart and wedge the material to be cut. Thereby the greater the resistance which is met in cutting, the greater will be the tendency of the blade edges to "bite in" and to shear.

Should the resistance offered in the shearing be too great, the blades will separate without taking a damaging permanent set. Further the uncut materials can be easily removed thereby preventing clogging of the shears.

It will be noted that the movements of the handles between open and closed positions thereof correspond to movements of the blades between their open and closed positions and that in all relative positions of the blades they are maintained in the canted relationship while the propelling means acts not only to swing the movable blade but assists in the cant relationship.

Conceivably, the device of the invention may be modified so as to comprise a pair of blades, both of which are of the movable type relative to the handle members with which they are held in pivotal relationship. Conceivably too, a pair of pusher members, heretofore described, may be employed wherein one pusher is connected with one of the handle members and with one of the blades, all to the end that as the handle members are moved toward each other, the pushers push forwardly against their respective blades so as to induce same laterally towards each other.

The invention may be embodied in other specific forms without departing from the essential characteristics thereof. Hence, the present embodiments are therefore to be considered in all respects merely as being illustrative and not as being restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all modifications and variations as fall within the meaning and purview and range of equivalency of the appended claims are therefore intended to be embraced therein.

What it is desired to claim and secure by Letters Patent of the United States is:

1. Shear construction comprising, a stationary blade structure including an elongated blade and a stationary handle extending from the rear end thereof, a movable blade, pivot means connecting the rear portions of the blade of said stationary

blade structure and said movable blade for swinging said movable blade relative to said stationary blade, said pivot means being disposed intermediate forward and rearward ends of said blades, a movable handle pivoted to said stationary handle, a rigid push rod pivotally connected at its forward end to said movable blade, and means on said movable handle cooperating with and acting on said push rod in a forward direction and in a plane angular to the plane of said movable and stationary blades to push said movable blade toward said stationary blade.

2. Shear construction comprising, upper and lower blades having inner shearing edges, pivot means disposed at the rear end portions of and swingably connecting said blades for relative swinging thereof in a horizontal plane between open and closed positions, an upper handle extending upwardly and rearwardly from the rear end portion of said lower blade, a lower handle below said upper handle, pivot means connecting said lower handle to said upper handle for relative swinging of said handles in vertical planes towards and away from one another, a rigid push rod in pivotal engagement with the rearward outer marginal edge of said upper blade, and means on said lower handle cooperating with said push rod to push said upper blade towards said lower blade.

3. Shear construction comprising, elongated lower and upper blades having inner shearing edges and rear end portions, pivot means swingably connecting said blades for relative swinging

thereof in a horizontal plane between open and closed positions disposed at the rear end portions of said blades, an upper handle extending upwardly and rearwardly from the rear end portion of said lower blade, a lower handle below said upper handle, pivot means connecting said lower handle to said upper handle for relative swinging of said handles in vertical planes towards and away from each other, pivots carried by said handles disposed on a vertical axis, a link swingably mounted on said pivots for swinging in a vertical plane and having a free end extending away from said pivots, a rigid push rod, and separate pivot means swingably connecting the opposite ends of said push rod to the rear end portion of said upper blade and to the free end of said link.

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