H. T. COLDWELL.

STATIONARY KNIFE BAR FOR LAWN MOWERS.

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1,171,593. Patented Feb. 15, 1916.

Fig. 1

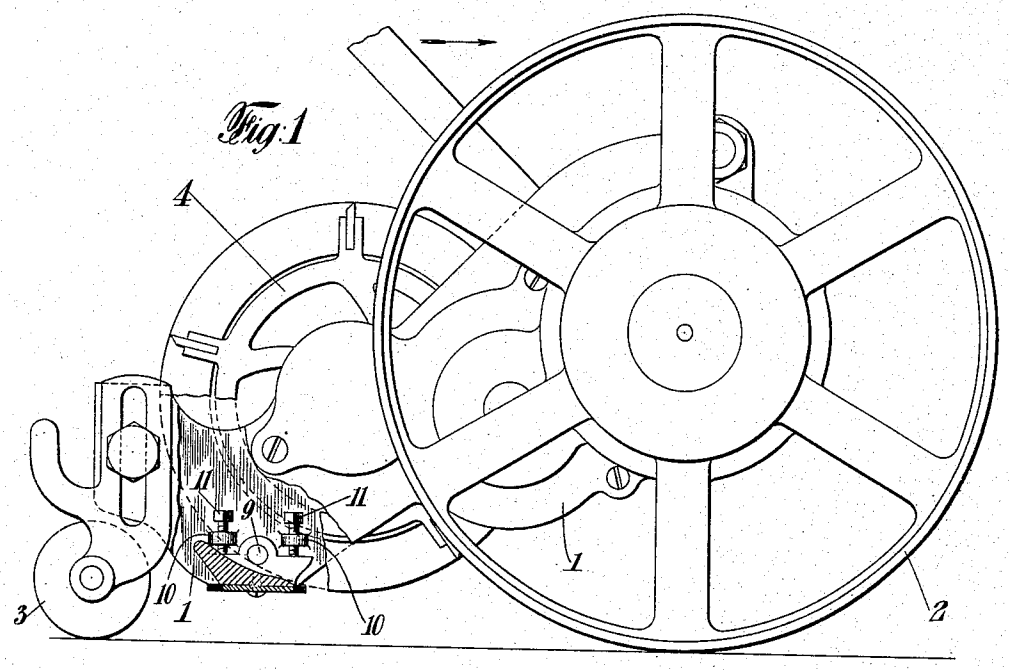


Fig. 5

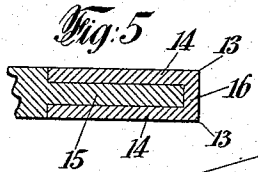


Fig. 2

Fig. 6

Fig. 3

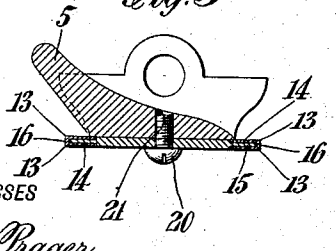
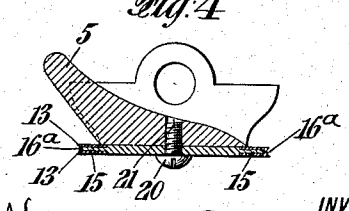


Fig. 4



WITNESSES

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STATIONARY KNIFE-BAR FOR LAWN-MOWERS.

1,171,593. Specification of Letters Patent. Patented Feb. 15, 1916.

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To all whom it may concern:

Be it known that I, HARRY T. COLDWELL, a citizen of the United States, residing at Newburgh, in the county of Orange and State of New York, have invented certain new and useful Improvements in Stationary Knife-Bars for Lawn-Mowers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention consists in the novel features hereinafter set forth, reference being had to the accompanying drawing, which illustrates one embodiment of the invention selected by me for purposes of illustration, and a slight modification thereof, and the said invention is fully disclosed in the following description and claims.

Referring to the said drawing, Figure 1 represents a side elevation of a lawn mower containing an embodiment of my invention, a portion of the machine being broken away and the stationary knife bar and knife being shown in section. Fig. 2 is a perspective view of the stationary knife bar and knife or blade, detached from the machine, the bar and blade being broken through the center and partially illustrated in section. Fig. 3 is an enlarged sectional view of the knife bar and knife or blade. Fig. 4 is a similar view illustrating a slightly modified form of the knife or blade. Fig. 5 is an enlarged sectional view of one of the longitudinal edges of the knife or blade shown in Figs. 1, 2, and 3. Fig. 6 is a similar view of one edge of the blade shown in Fig. 4.

In the manufacture of lawn mowers, it has been customary to provide cutting mechanism comprising a rotary cutter, provided with spiral cutting blades, and a stationary knife which must be rigidly supported in the machine and which presents a straight knife edge in shearing relation with the blades of the rotary cutter. For convenience of construction, it has been customary to form the stationary knife or blade of thin sheet steel having its forward edge beveled upwardly and forwardly so as to present an acute angular edge to meet the cutting edges of the rotary cutter blades, and to support the stationary knife or blade by securing it to a stationary knife bar rigidly secured to the frame of the machine and formed of cast iron or other suitable material of considerable thickness and strength and having a flat bottom face against which the thin steel blade is clamped by screws or rivets or other securing means. The stationary knife and rotary cutter are brought into proper shearing relation and one or the other of said parts is made adjustable so that as the cutting edge of the stationary knife wears, either the stationary blade or the rotary cutter may be adjusted toward the other part to compensate for this wear. The effect of the wear, however, is to increase the width of the portion of the stationary knife which is frictionally engaged by the cutting edges of the spiral rotary cutter blades, and after a certain amount of use, the stationary knife blade must be replaced with a new blade, in order to maintain the efficiency of the machine.

One of the objects of my invention is to provide a stationary knife or blade for a lawn mower having each of its longitudinal edges provided with two longitudinally extending cutting edges making four cutting edges altogether, and to provide means by which the knife may be supported in the lawn mower in four different positions, so that each one of the said cutting edges may be brought successively into shearing relation with the blades of the rotary cutter, and thus prolong the effective life of the blade, reduce the cost or upkeep of the machine, and avoid the necessity of returning the machine to the factory for the application of a new blade which is frequently necessary under present conditions.

Another object of my invention is to provide a blade of flat thin rolled stock of uniform thickness longitudinally and transversely, which is preferably formed of a body portion of low grade wrought metal with its longitudinal edges reduced and inclosed within surrounding portions of high grade steel which may be tempered and will take and retain a very sharp hard cutting edge, the lateral faces of the bar being preferably recessed longitudinally to permit the cutting edges to project beyond other portions of said lateral faces.

In Fig. 1 of the drawing, I have shown a lawn mower of the type in which the rotary cutter is mounted in stationary bearings in the frame of the machine and in which the stationary knife or blade is secured to a stationary knife bar adjustably supported in the lawn mower frame so that

it can be adjusted toward and from the axis of the rotary cutter, but it will be understood that my invention is equally applicable to other forms of the machine, in which, for example, the stationary knife bar is rigidly and permanently secured to the lawn mower frame and the rotary cutter is adjusted with respect to the stationary knife bar and stationary knife.

In the said drawings 1 represents the frame of the lawn mower supported by driving wheels 2 and the usual roller 3, and provided with a rotary cutter 4 mounted in suitable bearings (not shown) stationarily supported in the frame.

5 represents the stationary knife bar which is formed in this instance of cast iron and provided at each end with brackets 6—6 each of which is provided with a pivotal aperture 7 and horizontally disposed shoulders 8—8 on opposite sides thereof. The knife bar 5 is supported between the side plates of the frame 1 by pivot bolts or screws 9 engaging the apertures 7—7 of the brackets 6, thus permitting the knife bar to rock on the axes of said pivots, each of the side plates of the machine frame 1 being provided with lugs 10—10 above the shoulders 8—8 of said brackets, which lugs are provided with threaded apertures to receive adjusting screws 11—11 which bear upon said shoulders in a well known way so that by loosening one of said screws and tightening the other, or vice versa, the knife may be rocked and its forward edge moved toward or from the axis of the rotary cutter. My invention however, has no reference to the particular form of adjusting mechanism herein shown and described, and any other method of supporting and adjusting the stationary knife bar or by supporting the stationary knife bar rigidly, (in case the rotary cutter is adjustable with respect to it,) may be employed in lieu of the specific form of devices herein shown. The bottom of the knife bar is preferably flat or provided with flat faces in a plane tangential to the circular path of the cutting edges of the rotary cutter to receive the stationary knife or blade, indicated at 12. This blade consists preferably of a flat piece of steel having each of its longitudinal edges provided with two cutting edges 13 as clearly shown in Fig. 3, thus forming four longitudinal cutting edges. I prefer to form the central portion of the blade 12 of a low grade of steel and to provide it with edge portions 14—14 at each of its longitudinal edges of high grade steel, welded thereto and forming integral parts thereof. In practice, I prefer to reduce the longitudinal marginal portions of the inferior metal of the blade, as indicated at 15 and to apply thereto the high grade steel portions 14, which are U-shaped in cross sections, the portions 14 being welded or brazed or otherwise secured to the body portion 12 of the blade. The high grade portions 14 are tempered so as to form the two cutting edges 13 on each of the vertically disposed longitudinal edges of the blade 12, as described. I may form these cutting edges by grinding the ends of the upper and lower portions of the blade, as indicated at 16 in Figs. 2, 3, and 5, in which case the cutting edges 13—13 will be practically rectangular, or I may recess the lateral edges of the blades by providing them with longitudinally extending grooved portions, as shown at 16^a in Figs. 4 and 6, in which case the cutting edges 13—13 will be acute angular in cross section.

The stationary knife or blade 12 is detachably supported in operative relation in the machine so that one only of its four cutting edges 13 is in shearing relation with the cutting edges of the rotary cutter blades, so that the said knife or blade may be readily detached and its position changed to bring any one of the other cutting edges 13 into shearing relation with the blades of the rotary cutter. A convenient means for accomplishing this result is illustrated in the accompanying drawing in which the blade 12 is provided with a series of apertures at intervals longitudinally of the blade, said apertures having their axes at equal distances from each of the four cutting edges. These apertures receive securing screws 20 which pass through the same and engage threaded apertures 21 in the knife bar 5 and the apertures in the blade and those in the knife bar are so arranged that they will register when the knife or blade is turned end for end with respect to the knife bar, or in other words, the apertures in the knife bar and in the blade on each side of the center of length are located at corresponding distances from the center. It will thus be seen that the knife or blade may have either of its faces in contact with the bottom face of the knife bar and may also be turned end for end when either of said faces is uppermost, thus giving it four different positions with respect to the knife bar and enabling the operator to place any one of the four cutting edges in shearing relation with the rotary cutter by removing the stationary knife or blade and replacing it in the position desired.

As the rotary cutter is usually provided with from four to six blades, the wear on the stationary knife is greater than on any one of the blades of the rotary cutter, and by my invention the stationary knife will be given a life substantially equal to that of the blades of the rotary cutter and the necessity of replacing the stationary knife with a new knife, will be practically obviated.

What I claim and desire to secure by Letters Patent is:—

1. A reversible stationary knife for lawn mowers provided with plane portions on its upper and lower faces, and having a vertically disposed longitudinal edge connecting said faces, said longitudinal edge being provided with a recess extending longitudinally thereof, portions of the surface of said recess directly intersecting both upper and lower plane faces of the knife, to form acute angular cutting edges.

2. A reversible stationary knife for lawn mowers having plane portions on its upper and lower faces adjacent to each of its longitudinal edges, each of said longitudinal edges being provided with a recess extending longitudinally thereof, portions of the surface of each recess directly intersecting both the upper and lower plane faces of the knife and extending inwardly therefrom whereby four acute angular cutting edges are provided.

3. In a lawn mower the combination with a rotary cutter, of a stationary knife bar, having its entire knife engaging surface in a single plane tangential to the circular path of the cutting edges of the rotary cutter, means for securing said bar rigidly in position with respect to the rotary cutter, a reversible stationary knife consisting of a flat blade of uniform thickness throughout its length and width and of uniform cross section throughout its length and having its upper face engaging the plane knife engaging surface of the knife bar, the longitudinal edges of said knife being provided each with two cutting edges, adapted to be brought into operative relation with the rotary cutter, and means for securing said flat blade detachably to the said knife bar.

4. In a lawn mower the combination with a rotary cutter, of a stationary knife bar, having its entire knife engaging surface in a single plane tangential to the circular path of the cutting edges of the rotary cutter, means for securing said bar rigidly in position with respect to the rotary cutter, a reversible stationary knife consisting of a flat blade of uniform thickness throughout its length and width and having its upper face engaging the plane knife engaging surface of the knife bar, said blade comprising a body portion having its longitudinal edges reduced in thickness, and provided with edge portions of high grade steel applied to and embracing said reduced portions, and having their upper and lower faces flush with the faces of the central part of said body portion, each of the longitudinal edges of said blade being ground to form a cutting edge at both of its intersections with the plane faces of the blade, and means for securing said flat blade detachably to the said knife bar.

5. In a lawn mower the combination with a rotary cutter, of a stationary knife bar, having its entire knife engaging surface in a single plane tangential to the circular path of the cutting edges of the rotary cutter, means for securing said bar rigidly in position with respect to the rotary cutter, a reversible stationary knife consisting of a flat blade of uniform thickness throughout its length and width and having its upper face engaging the plane knife engaging surface of the knife bar, said blade comprising a body portion having its longitudinal edges reduced in thickness, and provided with edge portions of high grade steel applied to and embracing said reduced portions, and having their upper and lower faces flush with the faces of the central part of said body portion, each of the longitudinal edges of said blade being recessed and having portions extending inwardly directly from the intersection of said edge with the upper and lower plane faces of the blade, and means for detachably securing said blade against the bottom face of the knife bar, constructed to permit the blade to be inverted and turned end for end, whereby said blade will in each of its four operative positions, present an acute angular cutting edge in opposition to the cutting edges of the rotary cutter.

In testimony whereof I affix my signature, in the presence of two witnesses.

HARRY T. COLDWELL.

Witnesses:
GRAHAM WIESCHIEF,
HENRY W. MURTFELDT.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."