Feb. 7, 1950 E. H. WORTHINGTON 2,496,973

BED KNIFE FOR LAWN MOWERS

Filed March 16, 1946

Fig. 1.

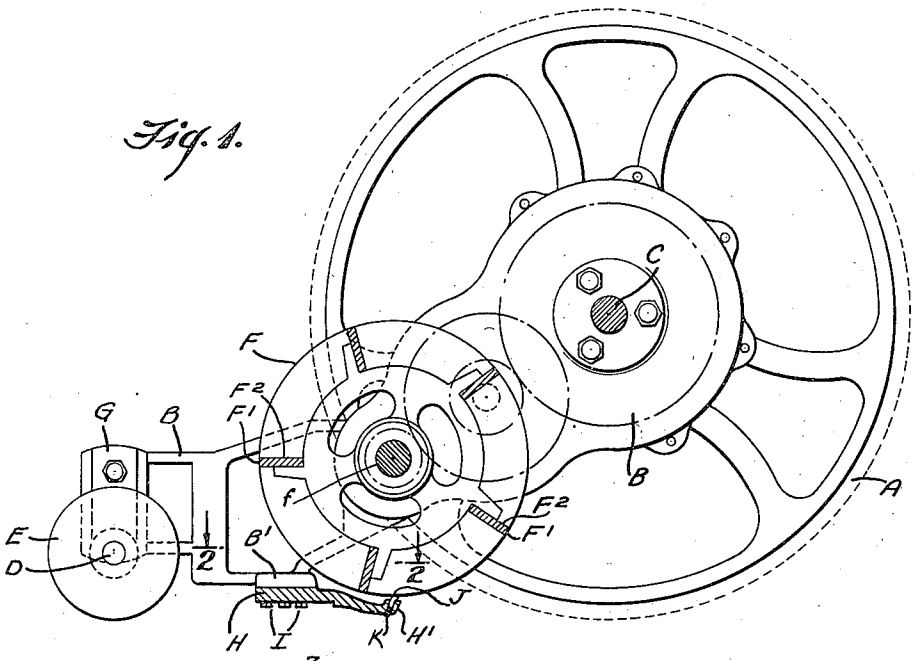


Fig. 2.

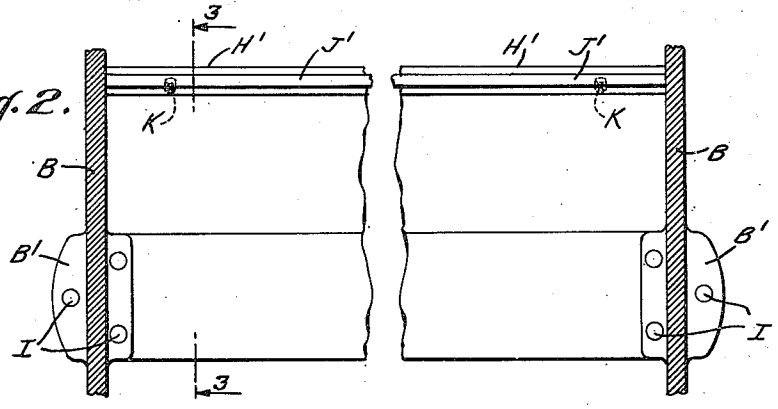


Fig. 4.



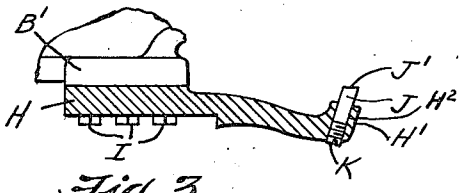


Fig. 3.

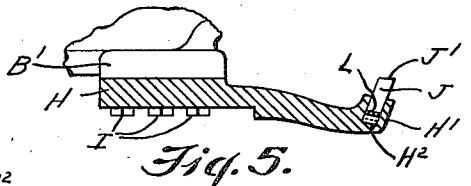


Fig. 5.

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BED KNIFE FOR LAWN MOWERS

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3 Claims. (Cl. 56—294)

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The present invention relates to lawnmowers of the usual type having a rotatable fly knife, or cutting reel and a non-rotatable bed knife wiped by the fly knife, as the latter is rotated in regular operation. In the normal operation of such a lawnmower, the point of contact of each helical fly knife blade with the bed knife moves longitudinally along the latter from one end to the other during a fraction of each revolution of the fly knife. Ordinarily, the length and helical inclination of the fly knife blades are such that at any one time the bed knife is engaged at each of a plurality of distributing points along its length by a different fly knife blade.

The general object of the present invention is to provide improved means for maintaining suitable contact of the bed knife with the cutting blades of the fly knife under the conditions of operation, which include the wearing away of the knives slowly in normal operation and more rapidly in the grinding operations to which they are subjected. The maintenance of such contact presents a serious problem for which many different solutions have been devised. The most usual practice of the art has been to rigidly secure the bed knife in a bed knife support and to mount the fly knife in a separate support and to relatively adjust the two supports as required to keep the two knives in contact to compensate for the wearing away of the cutting parts. The adjustable connection between the bed knife support and the lawnmower framework has taken many forms, though in most lawnmowers in common use the fly knife is journalled in the lawnmower framework to which the bed knife support is pivotally connected to turn about an axis external to the fly knife but parallel to the fly knife axis. The means associated with such angularly adjustable bed knives to effect and maintain their desired angular adjustments, are varied and no one form has been found generally satisfactory, and the more efficient forms are relatively complicated.

A specific and practically important object of the present invention is to provide a simple and effective bed knife construction and arrangement in which the bed knife is mounted in its support for upward movement as required to compensate for knife wear, without requiring any adjustment of the bed knife support relative to the lawnmower framework or fly knife axis.

In the preferred form of the present invention, the bed knife support is rigidly attached at its ends to the main side frame members of the lawnmower and is formed with a slot parallel to

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the fly knife axis and having its upper edge open beneath the fly knife and having uprising parallel side walls. The bed knife has a back portion received in said slot and fitting between the side walls of the latter, and has a cutting edge portion external to the slot and in position to be engaged by the fly knife cutting blades. The bed knife support is provided with means for moving the bed knife toward the fly knife as required to compensate for wear. Such means may take various forms. For example, adjusting screws may be threaded through the back wall of the slot into engagement with the back edge of the bed knife, or a spring or springs may be arranged to act between the bed knife and its support so as to resiliently hold the cutting edge of the bed knife in engagement with the fly knife cutting blades.

The various features of novelty which characterize my invention are pointed out with particularity in the claims annexed to and forming a part of this specification. For a better understanding of the invention, however, its advantages, and specific objects attained by its use, reference should be had to the accompanying drawing and descriptive matter in which I have illustrated and described a preferred embodiment of the invention.

Of the drawings:

Fig. 1 is an elevation in section through a conventional lawnmower, transverse to its fly knife axis;

Fig. 2 is a plan view of the bed knife and bed knife support;

Fig. 3 is an enlarged section taken on the line 3—3 of Fig. 2;

Fig. 4 is an elevation of a bed knife adjusting spring; and

Fig. 5 is a view taken similarly to Fig. 3, illustrating the use of the spring shown in Fig. 4.

In Figs. 1–3 I have illustrated an embodiment of the present invention in a lawnmower of a type which has long been in general use. The lawnmower shown comprises two ground-engaging wheels A, one at each side of the lawnmower and each of which is pivotally connected to an adjacent main side frame member B. The two side frame members B are rigidly connected by a non-rotating bar or shaft C which may or may not be coaxial with the wheels A. The side frame members B are customarily connected also by one or more other cross frame members, one of which may be the non-rotatable shaft D which extends through and serves as an axle for the usual ground roller E. A fly knife F having its shaft *f*

parallel to the shafts C and D is journalled at its ends in the side frames B. The latter are customarily chambered to enclose gearing through which the rotation of the wheels A rotates the fly knife F at a suitable angular velocity of the wheels A. The ends of the ground roller shaft D are shown as supported by members G connected to the side frame members B for adjustment to regulate the grass cutting level of the fly knife.

In the form of the present invention shown in the drawings, a bed knife support H extends between and has its ends rigidly connected to the side frames B. In the particular construction shown, the bed knife support H has each end clamped against the underside of a flange portion B' of the corresponding side frame by stud bolts I. The bed knife support is located between the ground roll E and the fly knife F, and has a depending portion H' at its edge adjacent the fly knife and formed with a slot H^2. The slot H^2 extends alongside the fly knife for substantially the full length of the latter, and has its open upper edge beneath the fly knife and intersecting, or closely adjacent to the vertical plane including the fly knife axis adjacent a lower portion of the fly knife. The slot H^2 has parallel side walls which are approximately vertical.

The slot H^2 receives the back portion of the bed knife J. The latter is in the form of a bar which is rectangular in cross section, except that one edge is bevelled to provide a cutting edge J' shaped and located for engagement by the cutting edges F' of the spiral cutting blades F^2 of the fly knife. As shown in Figs. 1, 2 and 3, the edges of the bed knife J adjacent the bottom wall of the slot H^2 is engaged by adjusting screws K extended through threaded openings in the back wall of the slot. In some cases, the bed knife may be spring pressed into engagement with the fly knife cutting blades, as by means of a distorted metal strip spring L within the slot H^2, and acting against the back edge of the bed knife. The spring L, one form of which is shown in Fig. 4, may act between the bed knife and the back wall of the slot H^2, as shown in Fig. 5, or between the bed knife and screws K extending through the back wall of the slot.

As will be apparent, my novel bed knife and its adjusting means are simple in construction and effective in operation, and may be easily maintained in operative condition. The slotted bed knife support H is also characterized by its simplicity and inherent strength and durability. It forms a rigid strut connection between the two side frames adapted to desirably increase the stiffness and strength of the lawnmower framework. The simple form of the bed knife permits of its relatively inexpensive construction of alloy material difficult to machine.

The side walls of the slot H^2 should be approximately vertical and approximately directly beneath the fly knife axis in the sense that they are so nearly vertical, are displaced so little from the vertical plane including the fly knife axis, that the bed knife will be engaged by the different portions of the fly knife edges as each such portion is moving in an approximately horizontal direction beneath the fly knife axis. In consequence, the wearing away of the fly knife blades will not result in a significant change in the displacement of the bed knife cutting edge from the vertical plane including the fly knife axis. The invention is therefore not adapted for use in a lawnmower in which the bed knife cutting edge is very close to the ground, but is adapted for use in lawnmowers employed in the extensive field in which the bed knife cutting edge is at least a couple of inches or so above the surface of the ground.

While in accordance with the provisions of the statutes, I have illustrated and described the best forms of embodiment of my invention now known to me, it will be apparent to those skilled in the art that changes may be made in the forms of the apparatus disclosed without departing from the spirit of my invention as set forth in the appended claims, and that in some cases certain features of my invention may be used to advantage without a corresponding use of other features.

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

1. In a lawnmower, the combination with a fly knife and a framework comprising side frame members in which the fly knife is journalled for rotation about its axis, of a bed knife support extending between and secured at its ends to said side frames and formed with a guideway approximately directly beneath the fly knife and in the form of a slot elongated in the direction of said axis and open at its upper edge and having parallel, approximately vertical side walls, a bed knife in the form of a bar having its lower portion in said guideway and having parallel, approximately vertical, side walls in sliding engagement with said guideway side walls and having upper and lower edges transverse to its side walls and normally having its upper edge in contact with the fly knife and forming the bed knife cutting edge, and means carried by said support acting between the latter and the lower edge of said bed knife for moving the latter toward the fly knife as required to maintain contact with the fly knife as the knives wear.

2. A lawn mower combination as specified in claim 1, in which the means acting between said support and the lower edge of said bed knife comprises adjusting screws in threaded engagement with said support.

3. A lawn mower combination as specified in claim 1, in which said support comprises a portion forming a back wall for said guideway slot and in which the means acting between said support and the lower edge of said bed knife is a metal strip spring in said slot and elongated in the direction of the latter and acting between said back wall and the lower edge of said bed knife.

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