H. S. MUSTIN.

GRASS CUTTING MACHINE.

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1,013,209.

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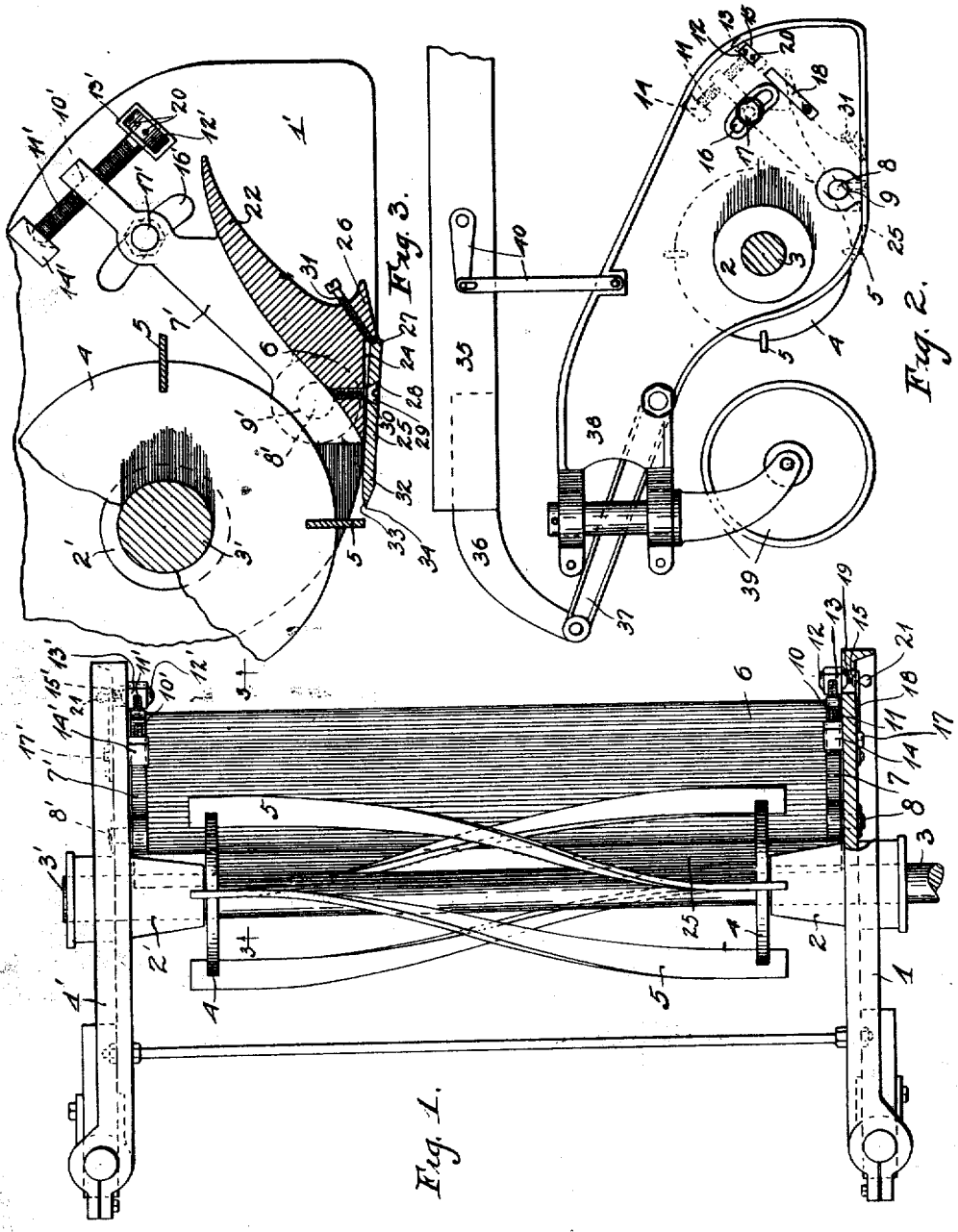

Fig. 1.

Fig. 2.

Fig. 3.

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UNITED STATES PATENT OFFICE

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GRASS-CUTTING MACHINE.

1,013,209. Specification of Letters Patent. Patented Jan. 2, 1912.

Application filed December 9, 1909. Serial No. 532,201.

To all whom it may concern:

Be it known that I, HERBERT S. MUSTIN, a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Grass-Cutting Machines, of which the following is a full, clear, and precise specification.

My invention relates to grass cutting machines, and concerns particularly improved construction and arrangement for bed knife bar and bed knife.

The salient objects of my invention are to provide improved arrangement for adjusting the bed knife bar and for adjusting the bed knife with reference to the bar to thereby enable better and more accurate adjustment of the bed knife edge with respect to the revolving blades coöperating therewith.

In the following specification and accompanying drawings my invention is clearly illustrated.

In the drawings Figure 1 is a plan view showing the bed knife mechanism, the rotary blades and the supporting frame work, Fig. 2 is an end view of the parts shown in Fig. 1, showing also part of a propelling frame for the cutting parts, and Fig. 3 is an enlarged sectional view taken on plane 3—3, Fig. 1.

The supporting structure comprises two similar side frames 1 and 1′ having at a central part the inwardly extending hubs 2 and 2′ for journaling the trunnions 3 and 3′ extending from the blade frame 4 which supports the spiral blades 5. Extending between the side frames below and to one side of the hubs is the bed knife bar 6 secured to end pieces 7 and 7′ from whose lower ends extend trunnions 8 and 8′ journaling in openings 9 and 9′ in the side members 1 and 1′ respectively. The ends of the side pieces 7 and 7′ have transverse threaded openings 10 and 10′ for receiving adjusting screws 11 and 11′ having heads 12 and 12′ respectively. These heads 12 and 12′ are retained in pockets 13 and 13′ respectively and the ends of the screws abut against lugs 14 and 14′ respectively, the pocket frames and lugs extending inwardly from the side frames 1 and 1′. The pockets are accessible from the outside of the side frames through openings 15 and 15′ respectively so that the heads are accessible for turning the screws to thereby swing the side pieces 7 and 7′ with the bed knife bar about the trunnions 8 and 8′. The side frames have also elongated slots 16 and 16′ for receiving locking screws 17 and 17′ having threaded engagement with the side pieces 7 and 7′ at an intermediate point so that the side pieces after adjustment by screws 11 and 11′ can be locked firmly in adjusted position. Secured at one end adjacent each of the openings 15 and 15′ is a spring 18 carrying at its end a pin 19 for engaging in the radial openings 20 in the heads 12 and 12′. Each pin has a head 21 whereby it can be readily withdrawn from said openings. After turning of the heads to adjust the side pieces 7 and 7′ the pins 19 are dropped into one of the openings 20 to lock the heads and screws in adjusted position so that if screws 17 and 17′ should become loosened the knife bar will still be retained in its adjusted position.

In Fig. 3 the cross-section shows the form of the bed knife bar 6. The back 22 of this bar slopes upwardly and laterally away from the blades 5 to deflect the cuttings. The base of the bar is cut away to leave the longitudinal pocket 24 for receiving the bed knife 25, the heel 26 of the bar sloping slightly upwardly. The bed knife is in the form of a plate having its inner upper edge cut away to leave a longitudinal concave abutment surface 27. The bed knife has a series of countersunk tapered openings 28 for receiving the tapered heads 29 of suspending screws 30 which thread into the knife bar, there being sufficient play between the screw heads and the openings 28 to allow tilting of the bed knife. Threading through the heel 26 of the knife bar are adjusting set screws 31 whose ends engage the concave surface 27 of the bed knife. The outer end 32 of the bed knife plate is primarily ground away to approximately a radius equal to the radius of rotation of the cutting blades 5. Upon rotation of the blades the upper surface 33 will be cut away smoothly to form a sharp cutting edge 34 at the outer end of the bed knife for coöperating with the cutting edges of the blades 5. After a period of use of the machine this upper surface 33 will be worn down and elongated thus greatly increasing the area over which the rotating blades must travel and consequently greatly increasing the friction and requiring more power for operating the machine, and the cutting edges of the blades will no longer coöperate

efficiently with the cutting edge of the bed knife. Dirt and grit carried by the blades across this elongated surface will also soon wear this surface down so that there will be a gap between the cutting edges. To restore proper and efficient cutting conditions the screws 29 are loosened and the set screws 31 brought up to lower the inner end of the bed knife to tilt the bed knife about the screw heads and thereby to raise the front end 25 so that a fresh shorter surface 33 can be formed on the bed knife by the cutting blades. After the proper adjustment is obtained the screws are again tightened. Besides adjusting the bed knife on the knife bar the knife bar as a whole can be rotated by first loosening locking bolts 17 and 17′ and withdrawing pins 19 and then turning heads 12 and 12′ to rotate screws 11 and 11′ in openings 10 and 10′ of the side pieces 7 and 7′, and after such adjustment pins 19 are again inserted and the locking nuts 17 and 17′ again tightened. Thus accurate adjustment can be obtained of the cutting end of the bed knife with respect to the blades 5 so that the cutting edges will work together efficiently at all times with the best cutting conditions and with the least friction, the blades 5 cutting and smoothing down the surface 33 after each adjustment of the bed knife or bed knife bar.

The frames 1 and 1′ can be connected to be pushed forwardly as in hand lawn mowers or can be connected to be pulled as in power grass cutting machines. In Fig. 2 I have shown the frames adapted for being pulled. 35 represents the front part of a power driven body which has forwardly extending arms 36 at its sides connected by links 37 with the frames 1 and 1′, the links being pivoted to the frames and to the extensions, as shown. The frames 1 and 1′ have forwardly extending arms 38 journaling at their ends casters 39. Suitable link mechanism 40 connects between the frames 1 and 1′ and the link body, and is operable in any suitable manner from the vehicle to raise and lower the frames to adjust the cutting parts with reference to the ground. The trunnions 3 and 3′ supporting the rotary blade frame 4 can be connected in any suitable manner with the driving source carried by the vehicle. I thus produce cutting mechanism in which the bed knife is readily and accurately adjustable and which is automatically re-sharpened after each adjustment to operate efficiently with little friction. I do not desire to be limited to the precise form and arrangement which I have shown for accomplishing this adjustment, as changes could readily be made which would still come within the scope of my invention.

I claim the following:

1. In cutting mechanism, the combination of rotary blades, a bed knife bar, a bed knife supported on said bar, said bar having pivotal support to be swung to change the distance between the cutting edge of said bed knife and the axis of rotation of said rotary blades, and means for tilting said bed knife on said bar to further adjust the cutting edge of said bed knife with respect to said blades.

2. In cutting mechanism, the combination of rotating spiral blades, a bed knife bar pivoted adjacent said blades, a bed knife tiltably suspended from said bar, means for bodily swinging said pivoted bar to adjust the distance between the cutting edge of said bed knife and the axis of rotation of said blades, and set screws passing through said bar to engage with said bed knife to cause tilting thereof and further adjustment of the cutting edge of said bed knife with respect to said blades.

3. In cutting mechanism, the combination of side frames, a blade frame journaled in said side frames, spiral blades supported on said blade frame, a bed knife bar pivoted at its ends in said side frames, a bed knife tiltably supported from the base of said bar, extensions from the ends of said bar having threaded openings, screws threading through said openings and journaled on said side frames, turning of said screws causing swing of said bar about its pivots to adjust the outer cutting edge of the bed knife with respect to said blades, and set screws passing through said bar for engaging with said bed knife to cause further adjustment of the cutting edge of the bed knife with respect to said blades.

4. In cutting mechanism of the class described, the combination of side frames, a blade frame journaled in said side frames, spiral blades supported on said blade frame, a bed knife bar pivoted at its ends in said side frames, a bed knife supported by said bar to coöperate with said blades, extensions on said knife bar having threaded openings, screws threading through said openings and journaled on said side frames, heads for said screws having openings, springs secured at one end to the side frames, and pins extending from the other ends of said springs to be held by said springs in said openings to thereby lock the screws after turning thereof, turning of said screws causing swinging of the knife bar about its pivots to adjust the bed knife with respect to said blades.

5. In cutting mechanism, the combination of rotating blades, a bed knife bar adjacent said blades, said bed knife bar having in its lower face a longitudinal groove, a bed knife disposed in said groove, screws engaging in said bar for suspending said knife in said groove and to allow tilting of said knife so that its outer cutting edge may be

adjusted with relation to the rotating blades, and adjustment screws extending diagonally through said bed knife bar and through the rear wall of said groove to engage with the knife at its rear upper edge to effect bodily forward thrust of the bed knife and also tilting adjustment thereof and to then rigidly hold said knife against vertical and horizontal displacement to thereby rigidly maintain the cutting edge of the knife in adjusted position with relation to the rotating blades.

In witness whereof, I hereunto subscribe my name this 30th day of November, A. D., 1909.

HERBERT S. MUSTIN.

Witnesses:
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