Feb. 9, 1954 K. J. KLENK 2,668,408

RECIPROCATING POWER MOWER, STEERED BY WALKING ATTENDANT

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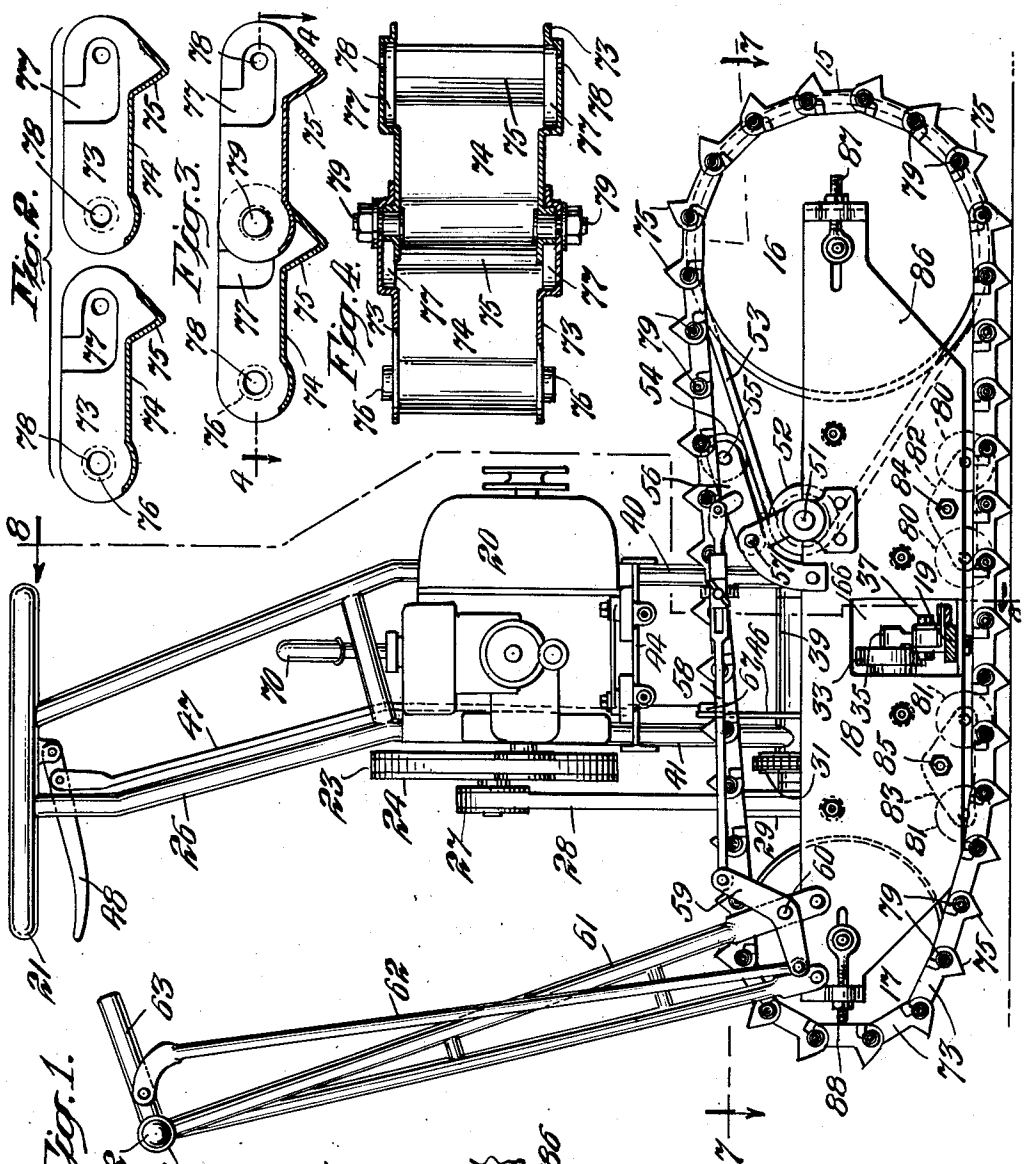


Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

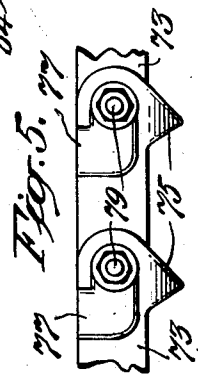


Fig. 5.

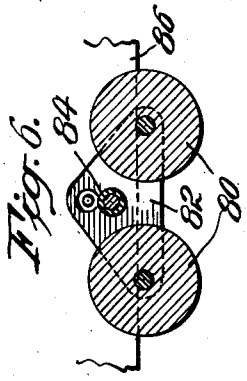


Fig. 6.

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Fig. 1.

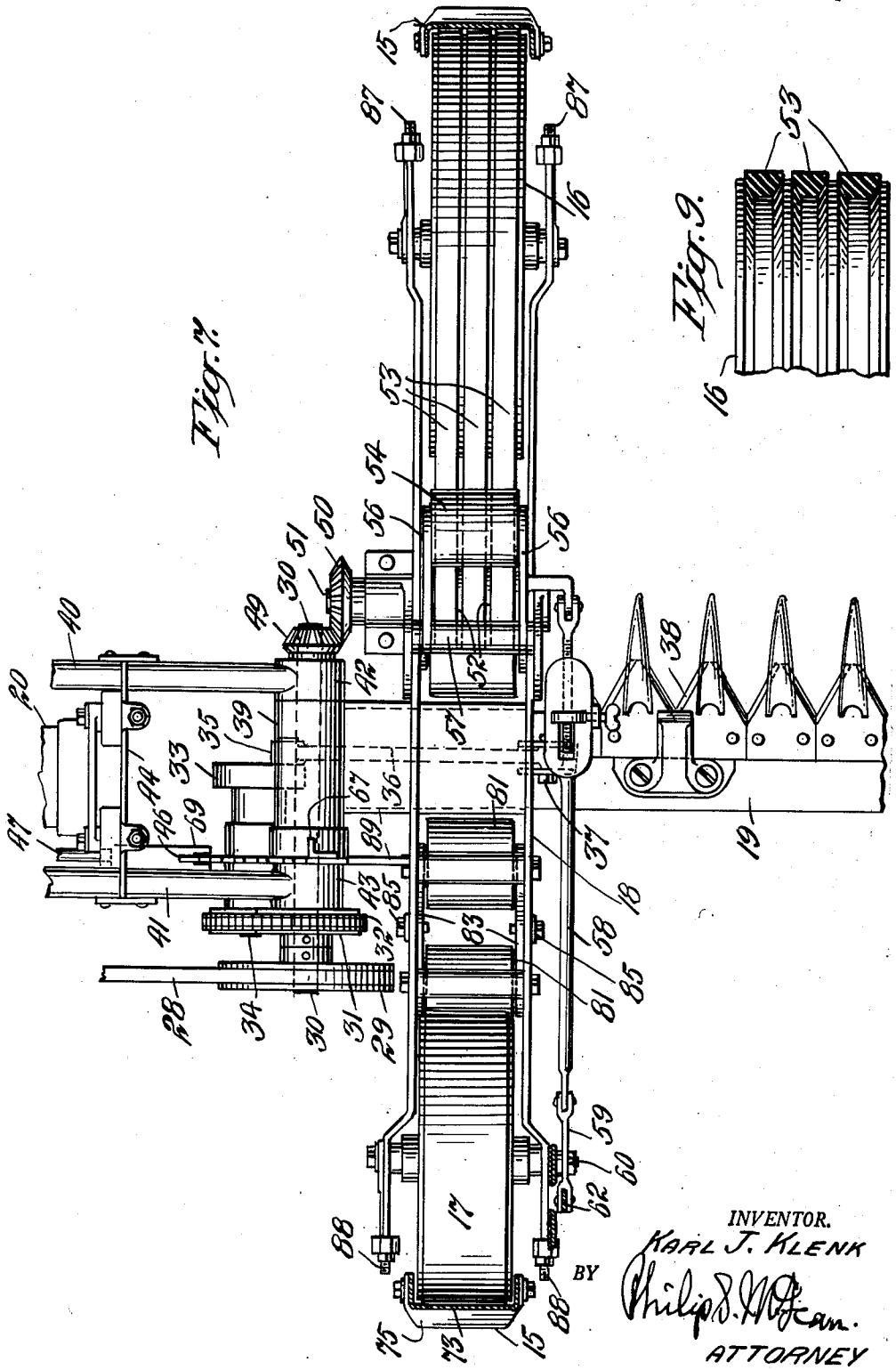


Fig. 2.

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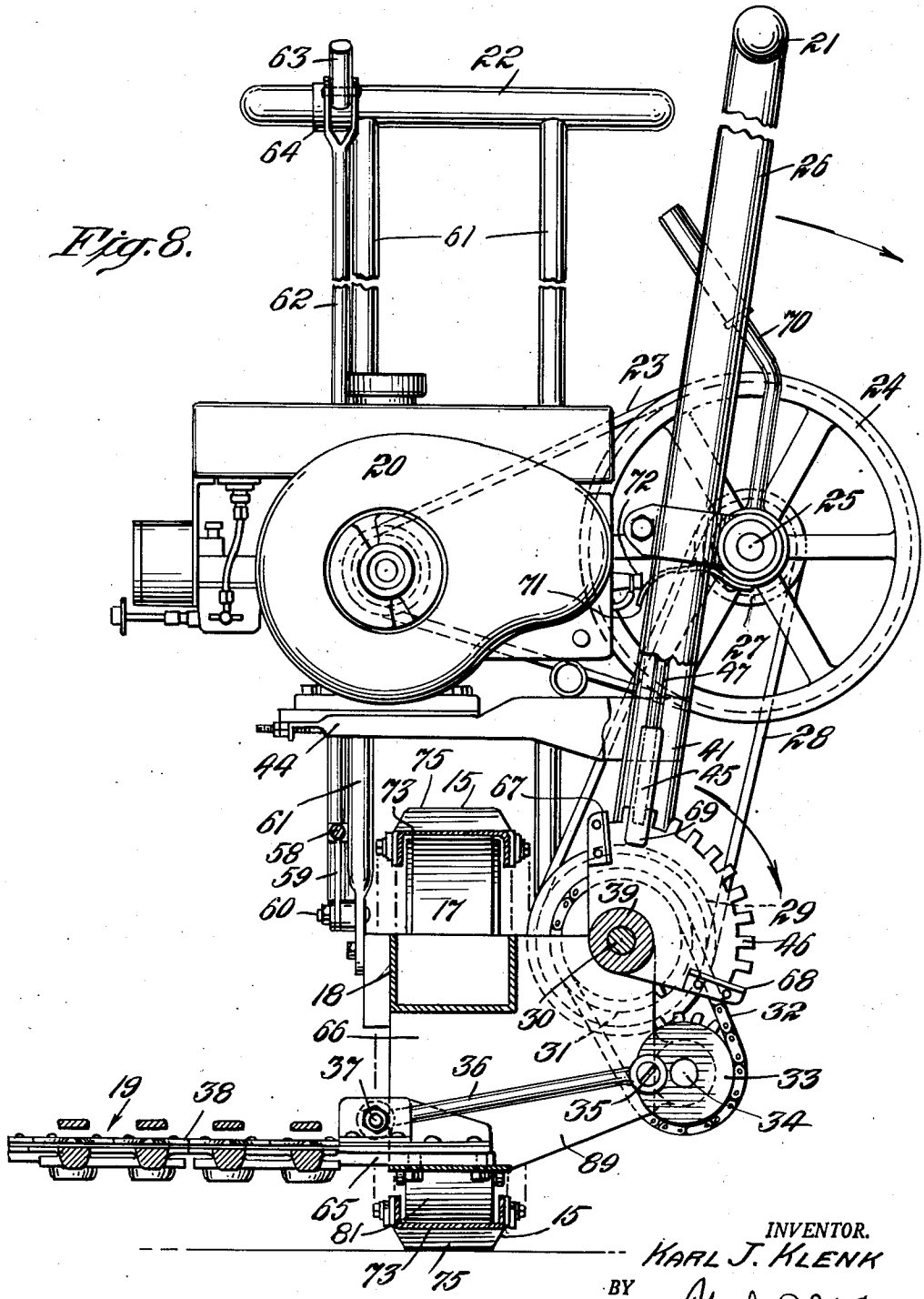
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Fig. 8.



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RECIPROCATING POWER MOWER, STEERED BY WALKING ATTENDANT

Karl J. Klenk, Wilmington, Del.

Application February 10, 1951, Serial No. 210,360

7 Claims. (Cl. 56—26.5)

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The invention herein disclosed relates to a new type of mowing machine embodying a power driven tractor and sickle arranged to be guided and controlled by one walking and following the same.

Special objects of the invention are to provide a practical machine of this character which will be under instant control of the walker at all times and which will adjust itself or be instantly adjustable to varying conditions of vegetation or contour.

Particularly it is a purpose of the invention to enable immediate control for stopping and starting and changing direction of movement and to effect lifting or lowering of the cutter bar to avoid rocks or other obstructions, and which while powerful and sturdy for all intended purposes, will be light enough and flexible in character to accomplish all such results without undue strain on the operator.

Other important objects of the invention are to provide a machine of the type indicated, of relatively simple, inexpensive construction and not liable to get out of order with ordinary use.

Other desirable objects attained by the invention are set forth or will appear in the course of the following specification in which the novel features of the invention are described and broadly claimed.

The drawings accompanying and forming part of the specification illustrate a present commercial embodiment of the invention. Structure and arrangement, however, may be modified and changed, all within the true intent and broad scope of the invention as hereinafter defined and claimed.

Fig. 1 in the drawings is a side elevation of the machine;

Fig. 2 is an enlarged composite view partly in section, showing two of the adjoining hollow metal links of the tractor chain in separated relation;

Fig. 3 is a generally similar view showing the two links hingedly connected;

Fig. 4 is a horizontal sectional view of two of the pivotally connected links as on substantially the plane of line 4—4 of Fig. 3;

Fig. 5 is an enlarged broken side elevation of the connected links;

Fig. 6 is an enlarged broken vertical sectional view showing one pair of the pivotally mounted chain supporting rollers;

Fig. 7 is a broken and part sectional plan view as on substantially the plane of line 7—7 of Fig. 1;

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Fig. 8 is a broken vertical sectional view on substantially the plane of line 8—8 of Fig. 1;

Fig. 9 is an enlarged broken sectional detail of the V-belt drive.

Basically the invention involves a single, forwardly running tractor chain 15 operating over forward and rear rolls 16, 17, journaled in an upright frame 18 carrying a laterally projecting sickle type cutter bar 19, all driven from a motor 20 and controlled by handles 21, 22, in convenient grasp of an individual walking behind the machine.

The motor is shown driving by belt 23, pulley 24 on shaft 25 journaled on the staff or lever 26 of the handle 21.

The shaft 25 is shown in Fig. 8 as carrying a pulley 27 over which a belt 28 passes to a pulley 29 on the lower shaft 30.

This lower shaft 30, as shown in Figs. 7 and 8, carries a sprocket gear 31 over which a chain 32 runs to a sprocket 33 on the shaft 34 carrying a crank 35 for the pitman 36 connected at 37 with the reciprocating cutter bar 38 of the sickle.

The lower, jack shaft 30 is shown disposed longitudinally of the machine at the side of and substantially parallel with the tractor chain and journaled solidly in an elongated fore-and-aft bearing 39 so that it may be utilized as a pivot mounting for the handle lever 26 which, as shown in Figs. 1 and 7, has two spaced branches 40, 41, terminating in bearing hubs 42, 43, pivoted to rock over the shaft 30.

The motor is shown mounted on a shelf or bracket 44 carried by and projecting inwardly from the handle lever 26 over the top of the tractor so that the entire power unit and drive mechanism will rock with the hand lever about the supporting center 30, Fig. 8.

To secure the power and drive unit in any selected angular relation, a holding pawl 45 is provided, engageable with the teeth of a fixed quadrant 46, Fig. 8, this pawl being slidingly mounted on hand lever 26 and connected by rod 47 with a grip lever 48 below the handle 21, Fig. 1, and thus in position to be actuated at any time by the hand gripping the handle.

The drive of the tractor is effected in the illustration through a bevel pinion 49 on the front end of shaft 30, in engagement with a bevel gear 50 on a shaft 51 journaled transversely across the tractor frame 18 and carrying V-belt pulleys 52 for the three V-belts 53 operating in V-grooves in the front drive wheel 16, beneath the tractor chain.

With this arrangement the overriding tractor

chain holds the belts in firmly gripping engagement with the drive wheel 16.

At the other end, however, the belts have a slipping engagement over the pulleys 52 and are gripped to these pulleys only when it is desired to have the machine in motion.

These results are attained by means of an overstanding roll 54 journaled at 55 in the arms of a forked lever 56, Figs. 1 and 7, which lever is pivotally supported on the frame at 57 and is connected by a link 58 with a bell crank 59 pivoted at 60 on the upstanding lever 61 which carries the handle 22, the other arm of the bell crank being connected by rod 62 with a hand lever 63 swiveled at 64 in forwardly projecting relation on the cross handle 22.

It will be observed in Fig. 1 that lifting movement on the hand lever 63 will pull up on rod 62 to cause the bell crank 59 to thrust the link 58 forward with the latter then operating to thrust the roll carrying lever 56 downwardly and the roll 54 in lowering engagement with the V-belts.

Hand lever 63 may thus be used as a clutch control to effect tightening of the V-belts on the driving pulleys 52 to effect drive of the tractor chain.

Lowering movement of handle 63 will effect an unclutching operation, leaving the V-belts free of driving pulleys 52.

Hence by control of lever 63 the machine may be started and stopped at will of the operator.

The parts are preferably so adjusted that some lifting effort on lever 63 is required to keep the machine in operation, so that the machine will instantly stop of itself if this control pressure is released at any time.

The machine is easily steered by means of the two handles 21 and 22 and through the medium of the controls located on these handles, the machine can be instantly stopped or the relative angularity of the two handles varied to suit changing contour or other conditions.

By releasing the latch 45 from quadrant 46, Fig. 8, the handle lever 26 may be inclined laterally one way or the other in respect to the handle lever 61 which is fixed to the tractor frame 18. This adjustment may be effected to keep the motor and its drive gearing relatively level while the tractor may rock one way or the other, as for down hill or up hill operation of the sickle projecting out from the side of the tractor.

Fig. 8 shows how the sickle mechanism is carried by the finger bar 65 projecting rigidly from the bottom of the tractor frame through the transverse opening 66 provided in this frame for the operation of the pitman 36.

Stops 67 and 68 are shown in Fig. 8 at opposite ends of the quadrant to limit the relative rocking adjustment of hand lever 26, these being engageable by the guide 69 on the lever through which the latch pawl 45 slidingly operates.

For motor stopping purposes a hand lever 70 is shown in Fig. 8 pivoted to rock about the center 25 and carrying a short circuiting strip 71 for engagement with the spark plug 72 of the engine.

This handle is within convenient reach of the hand on the motor carrying lever 26 so that at any time the motor can be instantly stopped by simply reaching down with this hand and throwing the handle over into the motor stopping position.

The chain 15 is of special construction to hold the V-belts on the drive wheel and to afford all necessary traction over rough as well as smooth ground.

Figs. 2 to 5 show how this chain is made up

of hollow sheet metal links having parallel sides 73 connected by flat webs 74 which at one end have outwardly projecting transverse V-bends 75.

At one end the sides of the links are outwardly bushed at 76 to provide tubular projections, and at the opposite ends offset outwardly to provide the angular bayonet joint grooves 77 sized to slidingly and pivotally receive the projecting hub portions 76 of adjoining links.

The embossed hubs 76 and the embossed channels 77 receiving the same are both perforated at 78 to accommodate bolts, rivets or like pivotal connections 79.

With this construction, broken or worn links may be quickly and easily replaced.

The V-belts gripped between the drive wheel 16 and surrounding chain provide a yielding clutch connection holding the chain against slipping on the wheel and, when driven by pulleys 52, imparting drive by direct engagement with the overstanding web portions of the links.

The lower run of the chain is shown in Fig. 1 as supported between the front and rear wheels, at opposite sides of the projecting cutter bar, by front and rear pairs of rolls 80 and 81 journaled in rockers 82, 83, pivoted at 84, 85, between the parallel side walls 86 of the tractor frame.

The slack adjusters 87, Fig. 1, for the front wheel enable adjustments required for maintaining the belts 53 loose on the driving pulleys until tensioned by the holddown roller 54, and the take-up adjusters 88 for the rear wheel allow for the first adjustments and then can be set up for proper tensioning of the tractor chain over the two wheels.

By means of the laterally spaced handles the machine may be easily guided and rocked one way or the other to lift or lower the cutter bar. By rocking backward on the handles the front end of the machine may be raised and in such position the machine may be turned and completely reversed in direction of movement.

The motor and drive mechanism mounted on the pivoted handle 26 at one side of the frame, to a large extent balances the sickle mechanism projecting from the opposite side of the frame, making the machine easily maneuverable without much effort on the part of the operator. To offset the weight of the motor, supporting handle and gearing to the side of the tractor opposite that from which the cutter projects, the bearing 39 carrying the handle pivoting shaft 38 is shown in Figs. 7 and 8 as carried by a laterally projecting bracket 89, forming a transverse projection of the main tractor frame 18.

The hollow chain links assembled as indicated form, in effect, a continuous flexible channel hugging the drive wheel and the V-belts passing about the same. The interfitting embossments at the ends of these links are of sufficient size and strength to carry the full load of the belt so that the pivotal connections 79 may be relatively light, serving mainly just to prevent separation of the links.

What is claimed is:

1. A power mower of the character disclosed comprising a single tractor chain, a sickle type cutter projecting from one side of said chain, a motor mounted for driving said tractor chain and cutter, a pair of handles for guiding said mower, control means for the mower adjoining said handles, a supporting frame for the tractor chain and cutter connected with one of said handles, the other handle being pivotally connected with said frame and supporting said motor, and drive connections from said motor to said cutter and

including a shaft carrying a drive gear, the pivotal mounting for said handle being concentric with said shaft and whereby angular adjustments of said handle will not affect the driving connections from said motor to said cutter.

2. A power mower comprising a frame, front and rear wheels journaled in said frame, a tractor chain operating over said wheels, a shaft journaled on said frame at one side, a cutter bar carried by said frame and projecting from the other side of the same, a handle pivoted on said frame concentric with said shaft, a motor carried by said handle, drive gearing from said motor to said cutter bar and including said shaft and a companion handle extended upward from said tractor frame.

3. A power mower comprising a frame, front and rear wheels journaled in said frame, a tractor chain operating over said wheels, a shaft journaled on said frame at one side, a cutter bar carried by said frame and projecting from the other side of the same, a handle pivoted on said frame concentric with said shaft, a motor carried by said handle, drive gearing from said motor to said cutter bar and including said shaft and a companion handle extended upward from said tractor frame and quick releasable means for adjustably securing said motor carrying handle in various angularly adjusted positions.

4. A power mowing machine of the character disclosed comprising a tractor frame having a guiding handle, a tractor chain operating in said frame, a companion handle pivotally mounted on said tractor frame at one side of the same, cutter mechanism projecting from the opposite side of said tractor frame, a motor carried by said pivotally supported handle and drive connections from said motor to said projecting cutter mechanism, including a power driven shaft concentric with the pivotal mounting center of said motor supporting handle.

5. A power mowing machine of the character disclosed comprising a tractor frame having a guiding handle, a tractor chain operating in said frame, a companion handle pivotally mounted on said tractor frame at one side of the same, cutter mechanism projecting from the opposite side of said tractor frame, a motor carried by said pivotally supported handle and drive connections from said motor to said projecting cutter mechanism, including a power driven shaft concentric with the pivotal mounting center of said motor supporting handle and detent mechanism for releasably securing said pivotally supported, motor carrying handle in different selected angular positions relative to said tractor frame handle.

6. A power mowing machine of the character disclosed comprising a tractor frame having a guiding handle, a tractor chain operating in said frame, a companion handle pivotally mounted on said tractor frame at one side of the same, cutter mechanism projecting from the opposite side of said tractor frame, a motor carried by said pivotally supported handle and drive connections from said motor to said projecting cutter mechanism, including a power driven shaft concentric with the pivotal mounting center of said motor supporting handle and drive connections from said motor to said tractor chain including controllable clutch means.

7. A power mower comprising a tractor frame, a motor frame pivotally mounted at one side of said tractor frame, laterally spaced handles on said tractor frame and motor frame usable in the nature of plow handles for guiding and controlling the machine, a tractor chain operating in said tractor frame, a motor carried by said pivotally mounted motor frame, drive connections from said motor to said tractor chain, a reciprocating cutter projecting from the tractor frame at the opposite side of the pivotal mounting of the motor frame and drive connections from the motor to said reciprocating cutter and including a jack shaft common to the drive connections to both the tractor chain and the reciprocating cutter and disposed in concentric relation to the pivotal mounting of the motor frame and whereby said motor frame may be swung by the handle thereon about the center of the pivotal mounting without disturbing the drive from the motor to the tractor chain and reciprocating cutter.

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