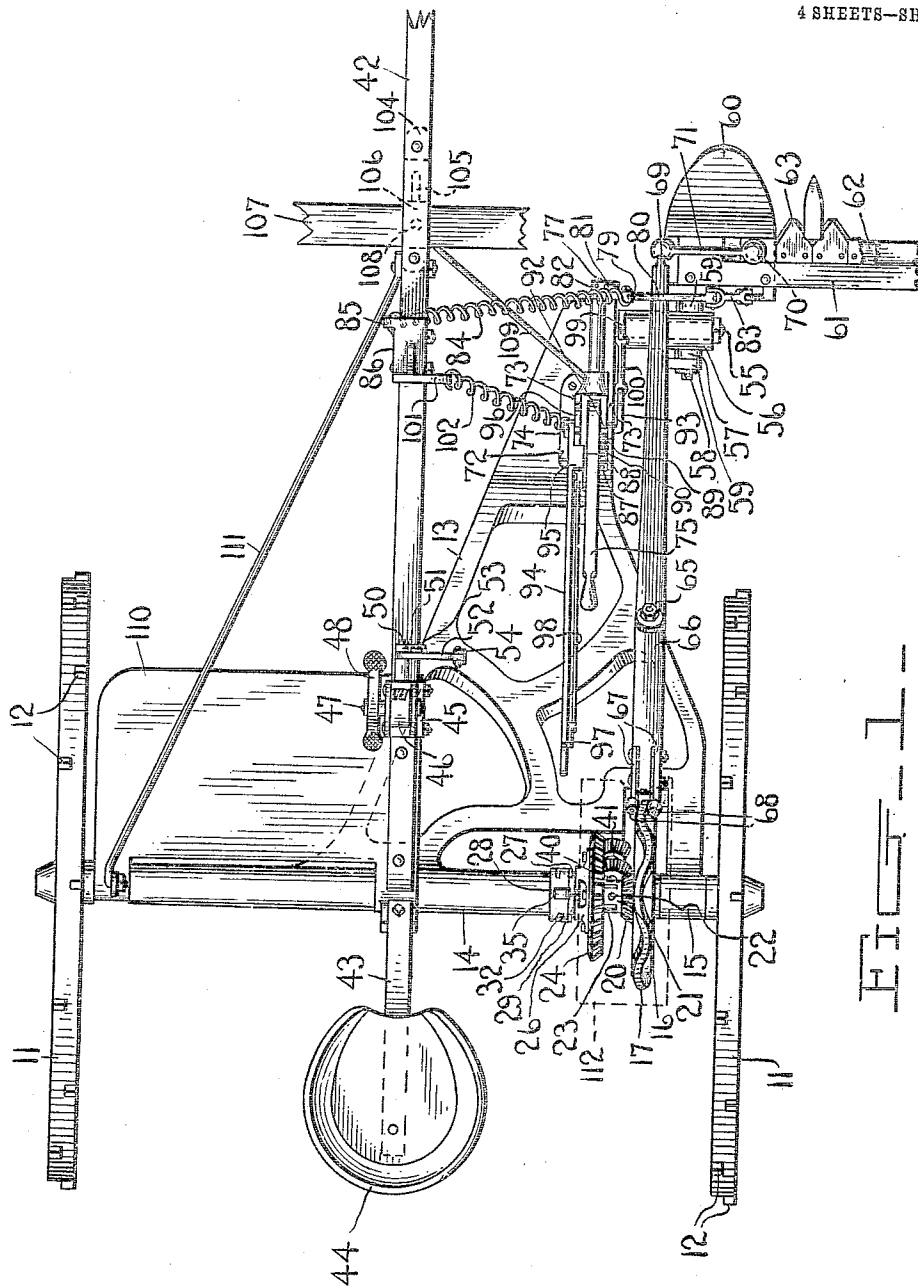


M. G. OTIS.
MOWING MACHINE.
APPLICATION FILED JAN. 18, 1909.

953,757.

Patented Apr. 5, 1910.

4 SHEETS—SHEET 1.



Inventor

Witnesses

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Charles Chandler

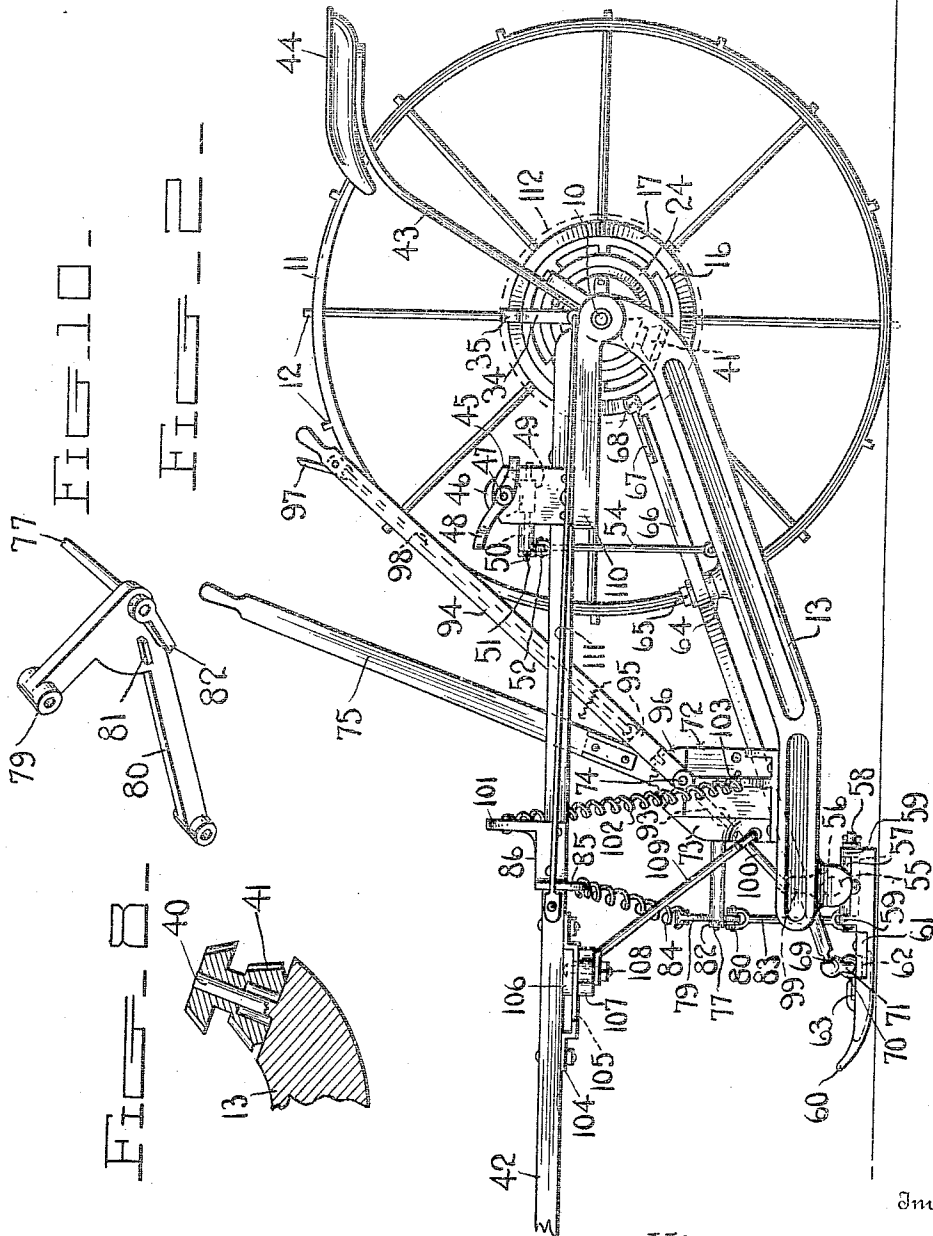
Attorneys

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4 SHEETS—SHEET 2.



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4 SHEETS—SHEET 3.

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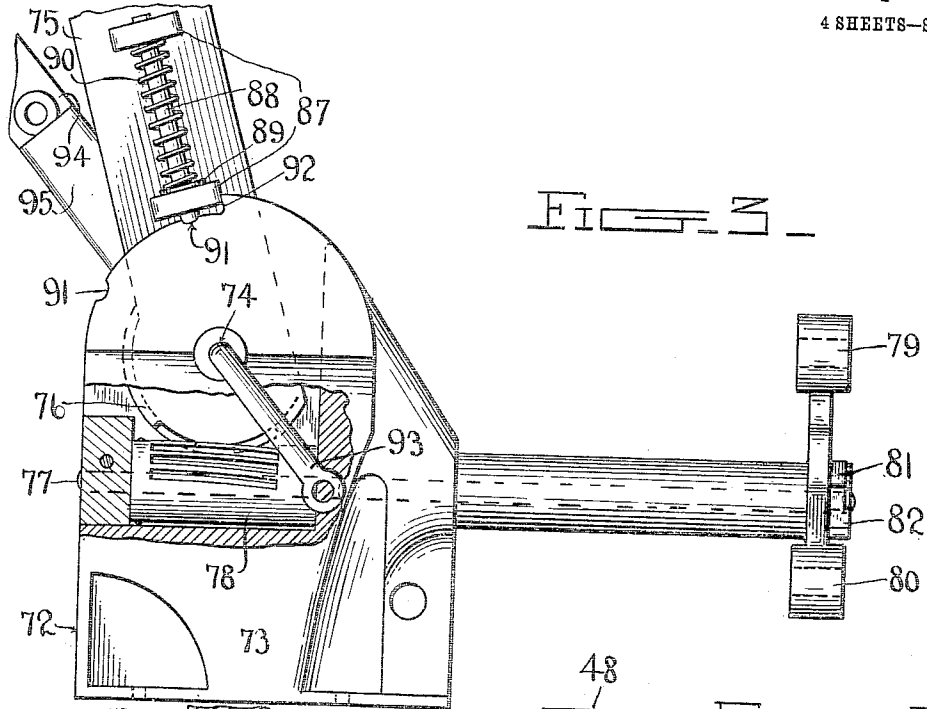


FIG. 3.

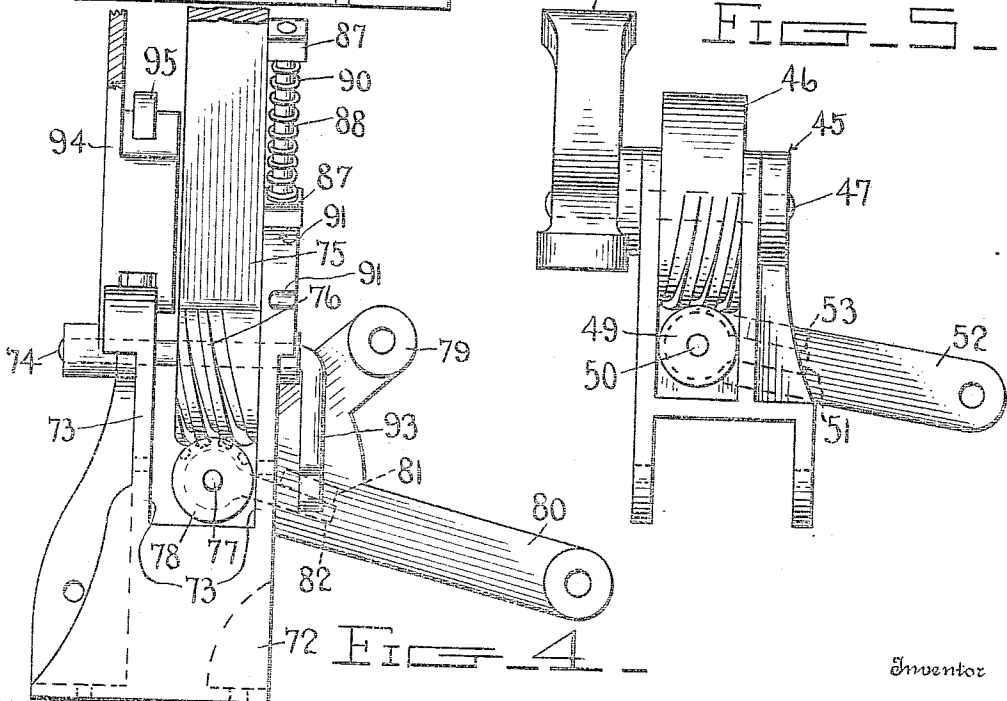


FIG. 4.

FIG. 5.

Witnesses
L. B. James
W. C. Miller

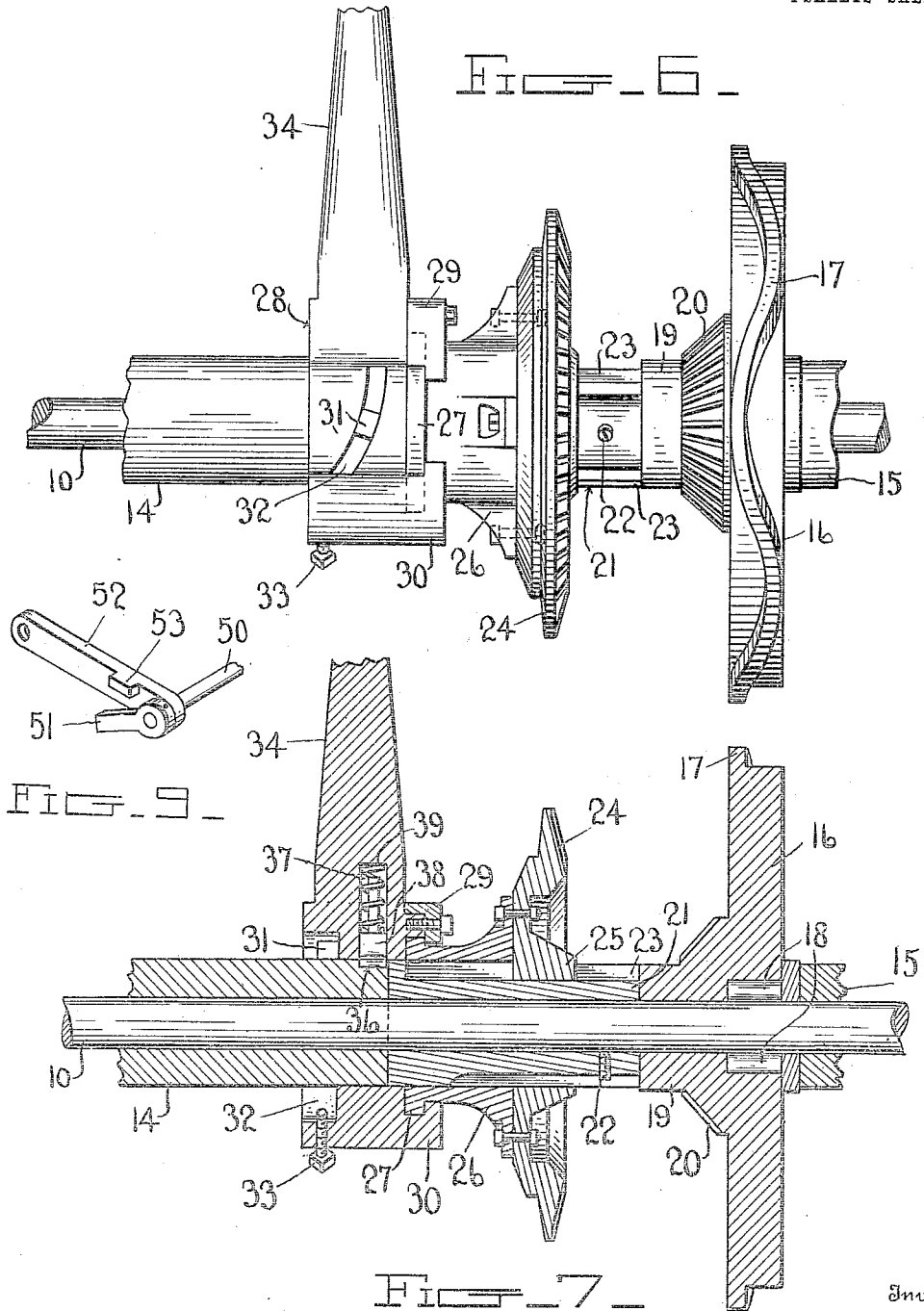
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4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

MILTON G. OTIS, OF ANIWA, WISCONSIN.

MOWING-MACHINE.

953,757.

Specification of Letters Patent.

Patented Apr. 5, 1910.

Application filed January 18, 1909. Serial No. 472,929.

To all whom it may concern:

Be it known that I, MILTON G. OTIS, a citizen of the United States, residing at Aniwa, in the county of Shawano, State of Wisconsin, have invented certain new and useful Improvements in Mowing-Machines; 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.

This invention relates to mowing machines and has special reference to a form of mowing machine in which a reciprocating cutter bar is used.

One object of the invention is to provide an improved general construction of machines of this character.

Another object of the invention is to improve the gearing whereby the cutter bar is actuated.

A third object of the invention is to provide an improved means for elevating or depressing the inner end of the cutter bar.

A fourth object of the invention is to provide an improved means for folding the cutter bar upward upon the body of the machine.

A fifth object of the invention is to provide a novel form of shoe for the cutter bar.

A sixth object of the invention is to provide an improved form of clutch for operating the main driving gear.

A seventh object of the invention is to provide an improved form of actuating lever.

The invention further consists in certain novel details of construction and combinations of parts hereinafter fully described, illustrated in the accompanying drawings, and specifically set forth in the claims.

In the accompanying drawings, like characters of reference indicate like parts in the several views, and:—Figure 1 is a top plan view of a mower constructed in accordance with this invention. Fig. 2 is a side elevation thereof. Fig. 3 is an enlarged detail partly in section showing one side of the cutter bar lifting device. Fig. 4 is a rear elevation of Fig. 3 with the back of the casing removed to show the interior. Fig. 5 is a rear elevation of the foot lift.

Fig. 6 is a rear elevation of the clutch gearing. Fig. 7 is a longitudinal section through this clutch gearing. Fig. 8 is a detail showing a portion of the frame whereon is mounted the double bevel gear. Fig. 9 is a detail of a portion of the main frame lifting mechanism. Fig. 10 is a detail of a portion of the sickle bar lifting mechanism.

The numeral 10 indicates the driving axle and upon this axle is secured a pair of traction wheels 11 provided with the usual tractor blades 12. The wheels 11 are fixedly mounted on the axle 10 so that as the machine is drawn over the ground this axle is caused to revolve.

At 13 is indicated the main frame of the machine and this frame is provided with a sleeve 14 wherethrough the axle passes in such manner that it is free to revolve therein. This sleeve 14 is preferably termed the inner sleeve and a similar sleeve 15 is provided on the main frame which is preferably termed the outer sleeve, the two sleeves being in spaced relation on the axle. Between the sleeves 14 and 15 there is mounted on the axle a drive wheel 16 provided with a driving cam 17 in the form of a sinuous peripheral rib. This wheel is provided with roller bearings as indicated at 18. The wheel 16 is further provided with a hub 19 on which is formed a bevel gear 20.

Secured upon the axle 10 between the hub 19 and the sleeve 14 is a bushing 21 which is held fixed to the axle by means of set screws 22. This bushing is provided with certain grooves 23 and has mounted thereon a gear 24 which is provided with ribs 25 held in the grooves 23 of the bushing.

Secured to the gear 24 and freely slidable on the bushing 21 is a sleeve 26 which is provided at its inner end with an annular rib 27. Mounted upon the sleeve 14 and sleeve 26 is a clutch member 28. In order to hold this clutch member upon the sleeve 26 there is mounted upon said clutch member a lock 29 which fits over a portion of the rib 27, while the clutch member has formed integral thereon a portion 30 which fits over the rib 27 opposite the block 29. Upon the sleeve 14 are provided lugs 31 and the clutch member is provided with grooves 32 of spiral form and engaged with the lugs 31.

Projecting into one of the grooves 32 is a stop screw 33 which is arranged to contact with one of the lugs 31 when the clutch member is revolved and thereby limit its motion. The clutch member 28 is further provided with an operating lever 34 having on its upper end a head 35. In order to hold the clutch member in adjusted position, the sleeve 14 is provided with certain notches 36 and the clutch member contains a recess 37 wherein is held a dog 38 provided with a spring 39 which normally presses the same toward the sleeve and into engagement with one of the notches 36.

Upon the frame 13 is mounted a stub shaft 40 and supported on this stub shaft is a double bevel pinion 41, one of the pinions being arranged to mesh with the gear 24 while the other pinion meshes with the gear 20. This pinion is so positioned as to be constantly in mesh with the gear 20 before the gear 24 is thrown into or out of engagement with the pinion 41 according as the lever 34 is moved forward or backward. By this means the motion of the axle 10 is transmitted to the gear 24 and from there to the drive wheel 16.

Mounted upon the axle 10 is the usual pole 42 and upon this pole is mounted a resilient bar 43 whereon is a seat 44 for the driver. Upon the pole 42 is secured a bracket 45 provided with a pair of spaced sides and between these spaced sides is mounted a worm 46 which is held upon a shaft 47, one end of which projects through one of the sides and has mounted thereon a foot lever 48. Mounted in the bracket 45 is a worm wheel 49 which meshes with the worm 46. Through the worm wheel 49 extends a shaft 50 and upon the outer end of the shaft is fixedly mounted a short lever 51. Loosely mounted on the outer end of the shaft 50 is a lift lever 52 which is provided with a lug 53 adapted to be engaged by the short lever 51. A link 54 connects the lift lever 52 with the main frame 13. By reason of this construction, the main frame is permitted to rise if the machine strikes an obstruction, while it may be raised at will by the operator moving the lever 48, since the movement of this lever will in turn raise the short lever 51 which will contact with the lug 53 and operate the lift lever 52. Further, by reason of the worm and worm wheel, the lifting of the frame will be readily accomplished and the pitch of the worm is such that the frame will be retained in lifted position without its being necessary to lock the lever in any way.

Upon the lower end of the main frame is a pin 55 which projects laterally from the frame and on this pin is mounted a sleeve

56. Rigidly attached to the sleeve 56 and extending transversely across the under side thereof is a similar sleeve 57 wherethrough passes a bolt 58, the bolt 58 also passing through a pair of spaced ears 59 which are formed on a shoe 60. Secured to the shoe 60 is a finger bar 61 and slidably mounted on this finger bar is a cutter bar 62 provided with the usual series of knives 63.

Upon the frame 13 is formed a boss 64 whereon is supported a pin 65 which forms the fulcrum of a lever 66 provided at its upper end with a pair of oppositely disposed jaws 67 upon each of which is mounted a roller 68. This lever 66 is so positioned that the rollers 68 engage upon opposite sides of the cam 17, the lever being thus vibrated as the cam is rotated. Upon the lower end of the lever 66 is a ball 69 and upon the knife bar 62 is a similar ball 70. A link 71 serves to connect the balls 69 and 70, being provided at each end with a socket to receive these balls.

Upon the frame 13 is mounted a bracket 72 and this bracket is provided with a pair of spaced sides 73 wherethrough passes a shaft 74. Upon this shaft 74 and freely revoluble thereon is mounted a lever 75 which has its lower end rounded and formed into a segmental worm 76. Extending transversely of the shaft 74 and located below the worm 76 is a second shaft 77 to which is fixedly secured a worm gear 78 which meshes with the worm 76. Upon the outer end of the shaft 77 and freely revoluble thereon is a lever having an arm 79 arranged in angular relation to a second arm 80. This lever is provided with a lug 81 and fixedly mounted on the shaft 77 is a short lever 82 which is adapted to engage with the lug 81 and rotate the arms 79 and 80 according as the lever 75 is moved. It is to be noted that this arrangement permits the arm 80 to rise freely no matter in what position the arm 82 may be, while at the same time it affords a positive means for raising said arm 80.

The arm 80 is connected to the shoe 60 by means of a link 83 and the arm 79 has secured thereto a spring 84, the other end of which is attached to an arm 85 formed on a bracket 86 which is mounted upon the pole 42. Upon the lever 75 is located a pair of spaced ears 87 through which passes a pin 88 provided with a collar 89. A spring 90 is held on the pin 88 between the collar and one of the ears so that it normally forces the pin downward toward the shaft 74. This pin 88 is held in alinement with one of the sides 73 and that side with which it alines is provided with suitable notches 91 to receive the end of the pin. This side is further provided with an upwardly project-

ing portion 92 which serves as a stop to limit the movement of the lever 75. It will now be plain that by moving the lever 75 the shaft 77 will be caused to rotate and the arm 80 raised. This will pull upon the link 83 and consequently rotate the shoe 60 around the shaft 58, thus lifting the outer ends of the knife and finger bars to a substantially vertical position, the spring 84 greatly assisting this operation. It will be noted that this lifting movement takes place at right angles to the axis of the pole.

In order to fold the knife and finger bars back toward the axle, another mechanism is used which will now be described. Mounted upon the shaft 74 is an arm 93, said arm being rigidly secured to the shaft and arranged to rotate therewith. Upon the other end of the shaft 74 is fixedly secured a lever 94 and upon the side of this lever is provided a latch 95 which engages with a quadrant 96 formed on one of the sides 73 of the bracket 72. This latch 95 is connected to an operating handle 97 by means of a rod 98. The sleeve 56 is provided with an upstanding arm 99 and this arm is connected to the lever 93 by means of a link 100. Now if the lever 94 be moved, the sleeve 56 will be caused to rotate on the pin 55 and will consequently raise or lower the forward end of the shoe 60 according to the direction in which the lever 94 is moved. If, previous to moving the lever 94 in the proper direction to raise the forward end of the shoe 60, the knife and finger bars be raised to the vertical position by means of the lever 75, any movement of the lever 94 which raises the forward end of the shoe will throw the finger and knife bars back toward the axle, and thus fold the same completely.

In order to assist in raising the frame 13 the bracket 86 is further provided with an arm 101 and a spring 102 is connected at one end to this arm and at the other end to a lug 103 formed on the bracket 72. In order to further lighten the work of lifting the main frame with all of its parts, there is mounted on the pole a clip 104 which is provided with a centrally arranged slot 105. Between the clip and the bolt is carried a block 106 to which is connected the usual double-tree or evener 107 by a bolt 108 which passes through the slot 105. Upon the lower end of this bolt is supported one end of a rod 109, the other end of which is attached to the bracket 72. This rod extends downward at an angle so that when the draft animals pull upon the machine the stress is not only transmitted to the axle but also directly to the front of the frame and this stress tends at all times to raise the frame while the weight thereof operates to prevent any movement of the frame. In order to rigidly

brace the pole and axle together, there is provided a supplementary frame 110 and a brace rod 111 extends from the outer end of this frame to the pole 42.

In the operation of this device, the machine is driven to the field with the sickle bar raised and thrown backward. Upon arriving at the place where it is desired to begin mowing, the operator pulls backward upon the lever 94 which depresses the front end of the shoe 60 and consequently raises the sickle bar from the folded back position to one substantially vertical. The operator then pushes forward upon the lever 75 and allows the outer end of the sickle bar to fall to the mowing position, which is of course flat upon the ground or nearly so. By properly regulating the lever 94, the machine is adjusted to cut the grass or grain as short as may be required. The operator then starts his horses and at the same time throws the clutch member 28 by means of the foot lever 34. This causes the gear 24 to engage with the double pinion 41 and rotates the drive wheel 16. The rotation of this drive wheel oscillates the lever 66 and by the connection of this lever with the knife bar 62 causes this knife bar to reciprocate in the usual manner. The foot lever 48 is also used for the purpose of adjusting the proper height of cut and may be utilized at different times to raise the knives over stones or the like, the other levers also assisting in this operation.

The numeral 112 indicates the casing for the gears and this casing is here shown in dotted lines so as not to interfere with the proper illustration of the invention.

It is obvious that minor changes may be made in the form and proportion of the invention without departing from the material principles thereof. It is not therefore desired to confine the invention to the exact form herein shown and described, but it is wished to include all such as properly come within the scope of the appended claims.

Having thus described the invention, what is claimed as new, is:—

1. In a mowing machine, an axle, wheels supporting said axle, a frame mounted on said axle, a pole attached to the axle, a bracket on said pole, a shaft mounted in the bracket, means to rotate said shaft, a lever loosely mounted on said shaft, a second lever fixed on said shaft and adapted to operate the first lever, and a link connecting said first lever and frame.

2. In a mowing machine, an axle, wheels supporting said axle, a frame mounted on said axle, a pole attached to the axle, a bracket on said pole, a shaft mounted in said bracket, means to rotate said shaft, a lever loosely mounted on said shaft, a lug

on said lever, a second lever fixed on said shaft and having its end adapted to contact with said lug, and a link to connect the end of the first lever and said frame.

5 3. In a mowing machine, an axle, wheels supporting said axle, a frame mounted on said axle, a pole attached to the axle, a bracket on said pole, gears carried by said bracket, a lever arranged to actuate said
10 gears, a second lever actuated by said gears, and a link connecting the second lever and frame.

4. In a mowing machine, an axle, wheels supporting said axle, a frame mounted on
15 said axle, a pole attached to the axle, a bracket on said pole, a shaft carried thereby, a worm fixed on said shaft, a lever fixed on said shaft, a second shaft carried by the bracket, a worm wheel fixed on said second
20 shaft and meshing with said worm, a second lever mounted on said second shaft, and a link connecting the second lever and frame.

5. In a mowing machine, an axle, wheels supporting said axle, a frame mounted on
25 said axle, a pole attached to the axle, a bracket on said pole, a shaft carried thereby, a worm fixed on said shaft, a lever fixed on said shaft, a second shaft carried by the bracket, a worm wheel fixed on said second
30 shaft and meshing with said worm, a second lever loosely mounted on said second shaft, means for operatively connecting said second lever and second shaft, and a link connecting the second lever and frame.

35 6. In a mowing machine, an axle, wheels supporting said axle, a frame mounted on said axle, a pole attached to the axle, a bracket on said pole, a shaft carried thereby, a worm fixed on said shaft, a lever fixed
40 on said shaft, a second shaft carried by the bracket, a worm wheel fixed on said second shaft and meshing with said worm, a second lever loosely mounted on said second shaft, a lug on said second lever, a third
45 lever fixed on said second shaft and adapted to engage said lug, and a link connecting the second lever and frame.

7. In a mowing machine, a wheel supported frame, a stub shaft projecting laterally from said frame, a sleeve revolubly
50 mounted on said stub shaft, a second sleeve rigidly attached to and transverse to said first mentioned sleeve, a shoe provided with a pair of spaced ears, a bolt passing through
55 said ears and second sleeve, a bracket on said frame, a shaft supported in said bracket, a lever loosely mounted on said shaft, means to rotate the shaft, other means to operatively connect said shaft to the lever,
60 a link connecting said lever and shoe to rotate the latter in one of said planes, and elements arranged to rotate the shoe in the other plane.

8. In a mowing machine, a wheel supported frame, a shoe supported from said
65 frame and arranged to be rotated in two planes, a bracket on said frame, a shaft supported by the bracket, a lever loosely mounted thereon, means to rotate the shaft, other means to operatively connect said shaft and
70 lever, a link connecting said lever and shoe to rotate the latter in one of said planes, and elements arranged to rotate the shoe in the other plane.

9. In a mowing machine, a wheel supported frame, a shoe supported from said
75 frame and arranged to be rotated in two planes, a bracket on said frame, a shaft supported by the bracket, a lever loosely mounted on said shaft, means to rotate the shaft, a second lever fixedly mounted on said shaft
80 and adapted to engage the first lever and rotate the same, a link connecting the first lever and shoe to rotate the latter in one of said planes, and elements arranged to rotate
85 the shoe in the other plane.

10. In a mowing machine, a wheel supported frame, a shoe supported from said
frame and arranged to be rotated in two planes, a bracket on said frame, a shaft supported
90 by the bracket, a lever loosely mounted on said shaft, means to operatively connect said shaft and lever, a link connecting said lever and shoe to rotate the latter in one of said planes as the lever is rotated, elements
95 arranged to rotate the shoe in the other plane, a second shaft mounted in said bracket, a lever provided at its lower end with a worm face, and a worm wheel on the first mentioned shaft arranged to mesh with
100 said lever end.

11. In a mowing machine, a wheel supported frame, a shoe supported from said
frame and arranged to be rotated in two planes, a bracket on said frame, a shaft
105 mounted in said bracket, a lever loosely mounted on said shaft, means to operatively connect said shaft and lever, a link connecting said lever and shoe to rotate the latter in one of said planes, a worm wheel mounted
110 on said shaft, a second shaft, an operating lever provided with a worm faced end held on the second shaft to rotate thereon, said worm end engaging said worm wheel, a second lever fixedly mounted on the first shaft,
115 a second operating lever fixedly mounted on said second shaft, and a link connecting the second lever with said shoe to rotate the latter in the other plane.

12. In a mowing machine, a wheel supported frame, a stud shaft projecting laterally from said frame, a sleeve revolubly
120 mounted on said stub shaft, a second sleeve rigidly attached to and transverse to the first mentioned sleeve, a shoe provided with a pair of spaced ears, a bolt passing through
125

said ears and second sleeve, a bracket on said
frame, a shaft supported by the bracket, a
lever loosely mounted on said shaft, means
to operatively connect the shaft and lever,
5 a worm wheel fixed on said shaft, a second
shaft, an operating lever provided with a
worm faced end meshing with said worm
wheel and loosely mounted on the second
shaft, a second lever fixedly mounted on the
10 second shaft, a second operating lever fixedly

mounted on said second shaft, and links
connecting the first and second levers with
the shoe to rotate the same in each of said
planes.

In testimony whereof, I affix my signature, 15
in presence of two witnesses.

MILTON G. OTIS.

Witnesses:

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E. R. HANSEN.