

No. 751,223.

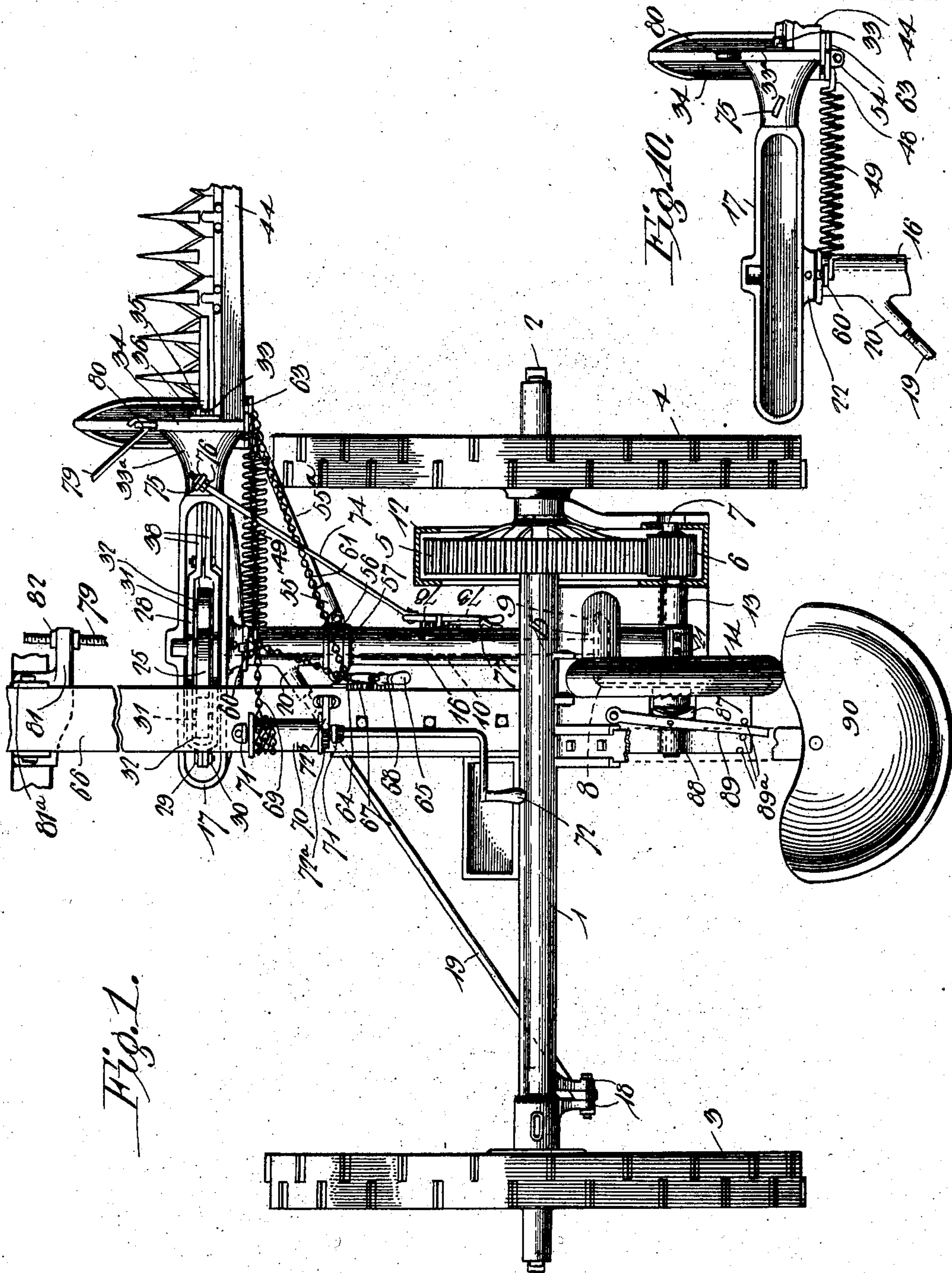
PATENTED FEB. 2, 1904.

A. M. THREEWITS.
MOWING MACHINE.

APPLICATION FILED SEPT. 26, 1901.

NO MODEL.

3 SHEETS—SHEET 1.



Witnesses:

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No. 751,223.

PATENTED FEB. 2, 1904.

A. M. THREEWITS.
MOWING MACHINE.

APPLICATION FILED SEPT. 25, 1901.

NO MODEL.

3 SHEETS—SHEET 2.

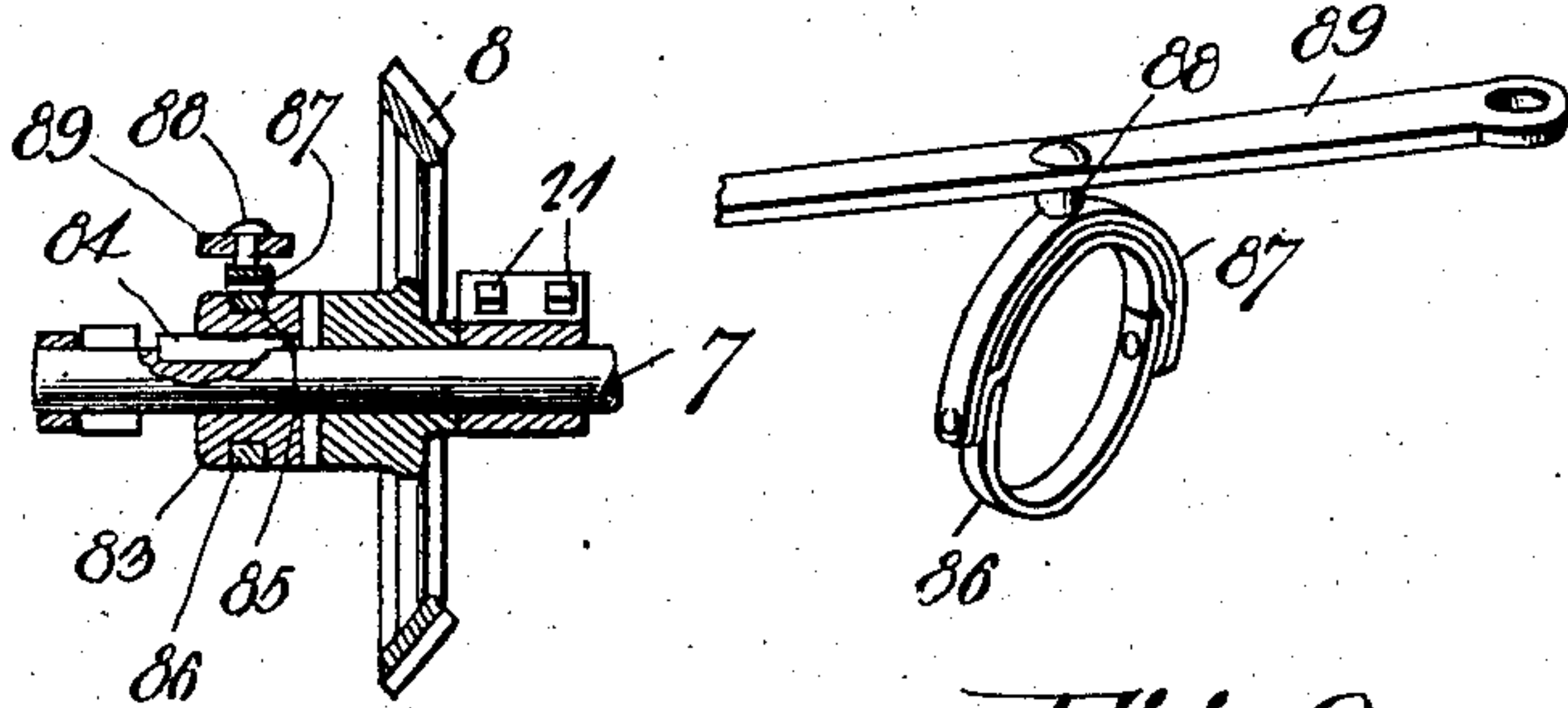
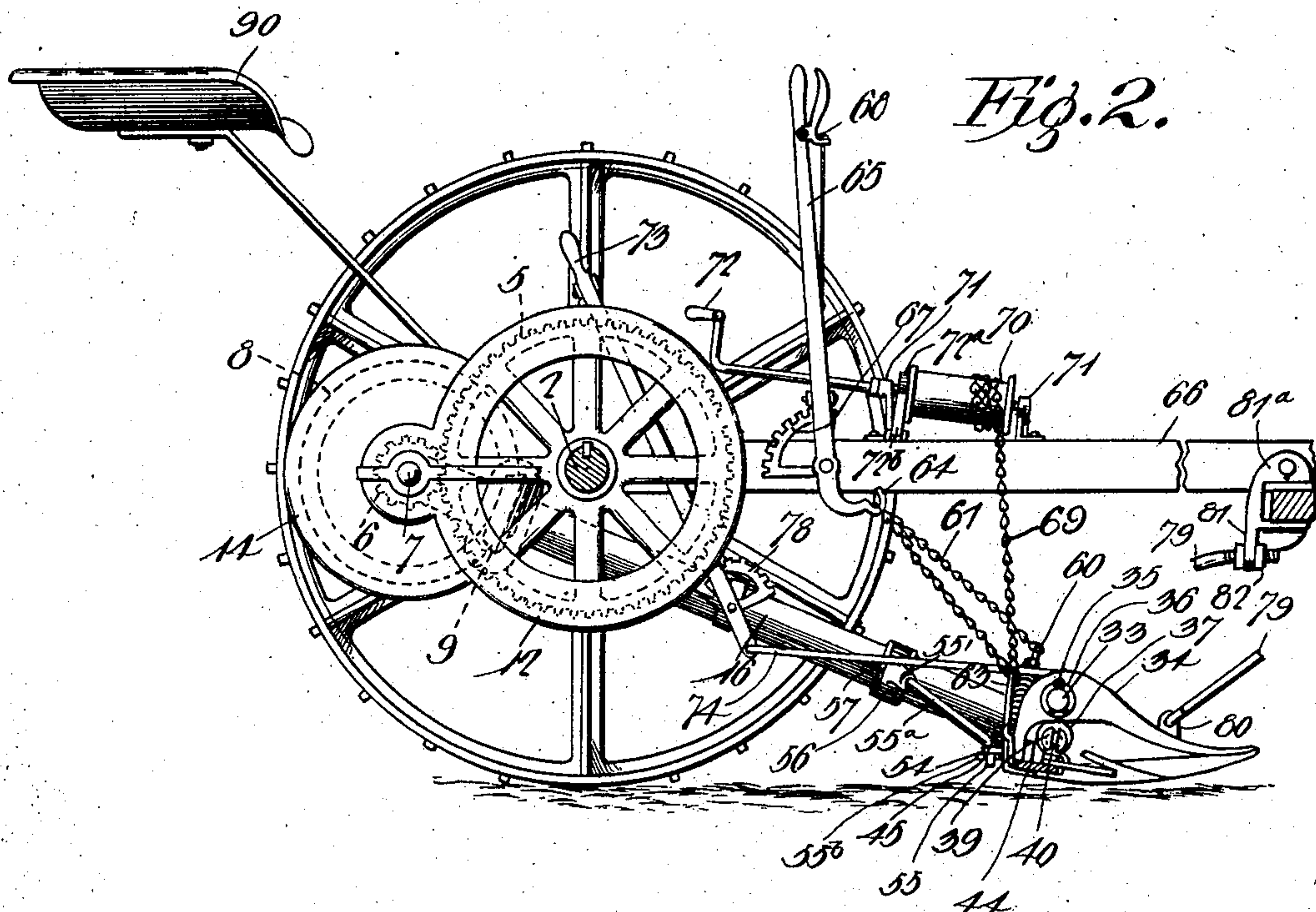


Fig. 8.

Fig. 9.

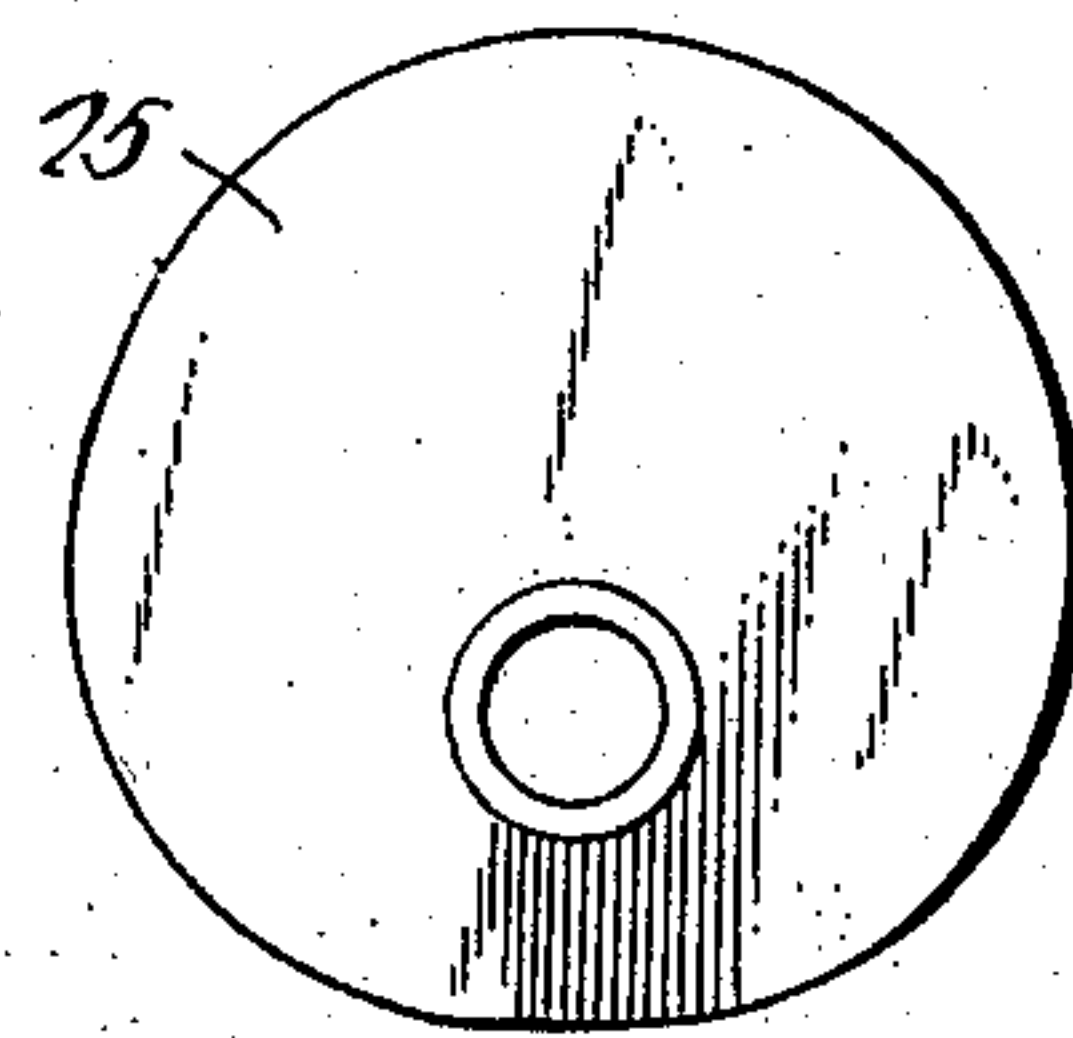


Fig. 11.

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UNITED STATES PATENT OFFICE.

ALVIN M. THREEWITS, OF CENTERVILLE, INDIANA.

MOWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 751,223, dated February 2, 1904.

Application filed September 25, 1901. Serial No. 76,482. (No model.)

To all whom it may concern:

Be it known that I, ALVIN M. THREEWITS, a citizen of the United States, residing at Centerville, in the county of Wayne and State of Indiana, have invented a new and useful Mowing-Machine, of which the following is a specification.

This invention relates to mowing-machines, and has for its object to present a cheaply-constructed, highly-durable, and thoroughly-efficient machine which in use will be effective for long-continued use without danger of the parts becoming broken or injured under ordinary usage.

A further object is to present a novel form of cutter-bar-actuating mechanism which in operation shall be positive in its action and will prevent any clattering or banging resulting from lost motion, the construction of the mechanism being such that all lost motion is absorbed.

A further object is to present a novel form of attachment between the casing or boxing of the cutter-bar-actuating mechanism and the shoe, the connection being such as to permit of the finger-bar being tilted or rocked without changing the position of the boxing of the cutter-bar-actuating mechanism.

A further object is to provide a novel form of balancing-spring for the finger-bar, said spring to operate to hold the said bar yieldingly the required distance above the ground, thereby to permit such vibratory motion of the bar, as may be requisite, without any violent whipping or jumping action under the operation of the machine.

With these and various other objects in view, as will appear as the nature of the invention is better understood, the same consists in the novel construction and combination of parts of a mowing-machine, as will be hereinafter fully described, and specifically pointed out in the claims.

In the accompanying drawings, forming a part of this specification, and in which like numerals of reference indicate corresponding parts, there is illustrated a form of embodiment of the invention capable of carrying the same into practical operation, it being understood that the elements herein exhibited may

be varied or changed as to shape, proportion, and exact manner of assemblage without departing from the scope of the invention, and in the drawings—

Figure 1 is a view in plan of the mowing-machine. Fig. 2 is a view in side elevation, partly in section. Fig. 3 is a view in plan, partly in section, of the cutter-bar-actuating mechanism. Fig. 4 is a view in side elevation, partly in section, of the said mechanism. Fig. 5 is a view in elevation, partly in section, showing the cutter-bar drive-shaft and the sleeve or casing in which it is housed. Fig. 6 is a view in perspective of a bracket to which certain of the operating mechanisms of the apparatus are connected. Fig. 7 is a detached detail view in section, showing the collar on the sleeve of the cutter-bar drive-shaft and a portion of the brace-rod that connects with the collar and with the bracket shown in Fig. 6. Fig. 8 is a detached detail view in section, showing a part of the clutch mechanism for controlling the operation of the cutter-bar. Fig. 9 is a detached detail view in perspective, showing the collar or ring that is associated with the movable member of the clutch. Fig. 10 is a view in plan, showing more particularly the manner of connecting the balancing-spring with the sleeve of the cutter-bar drive-shaft and with the bracket on the heel of the shoe. Fig. 11 is a detached detail view of the actuating-cam that effects reciprocation of the cutter-bar. Fig. 12 is a fragmentary detail view of a part of the adjustable shoe-runner, showing the manner in which it is connected with the shoe.

Referring to the drawings, 1 designates a tubular frame-bar, through which passes an axle 2, carrying the ordinary peripherally-toothed supporting and drive wheels 3 and 4, respectively, and mounted upon the shaft 2 is a driving-gear 5, meshing with a pinion 6, carried by a shaft 7, arranged parallel with the shaft 2, the shaft 7 carrying a bevel-gear 8, which meshes with a similar gear 9, carried by the cutter-bar-actuating shaft 10, through which motion through the medium of interposed mechanism is imparted to the cutter-bar. To shield the gear 5, pinion 6, shaft 7, and bevel-gears 8 and 9, these parts are in-

closed or housed within casings 12, 13, 14, and 15, respectively, the shaft 10 being also housed in a sleeve or casing 16, the latter carrying near one end the housing 15 of the bevel-gear 9 and at its opposite end a boxing or housing 17 for the cutter-bar-actuating mechanism. The tubular frame-bar 1 is provided at one side adjacent to the wheel 3 with two lugs or projections 18, between which is bolted one end of a brace-rod 19, the other end of which has a threaded connection with an angular offset 20, carried by the lower portion of the sleeve 16, this brace-rod 19 serving to give rigidity to the sleeve 16 to enable it to remain firm under the vibratory motion imparted to it from the operation of the cutter-bar, the upper end of the sleeve 16 having a swiveled connection with the shaft 7, in this instance by providing the said end of the sleeve with a two-part bearing, the members of which are held assembled by bolts 21. As will be observed by reference to Fig. 1, the lugs 18 project downward from the frame-bar 1, and by this arrangement the sleeve 16 and its co-acting mechanism may be raised or depressed thereby to regulate the distance at which the cutter-bar shall be held above the ground.

The boxing 17 has a tubular hollow portion 22, that is connected with the lower end of the sleeve 16, preferably by a screw-threaded connection, and the outer end of the shaft 10 works in a bearing 23, formed in the outer wall of the said boxing, the upper portion of the shaft 10 engaging a bearing 24, carried by the sleeve 16, adjacent to the boxing 15, and by thus providing bearings as near the extremities of the shaft 10 as is permissible the shaft will be caused to operate without any end shake, which would be objectionable, for well-known reasons. Upon the shaft 10 and working within the boxing 17 is mounted a cutter-bar-actuating cam 25, the same in this instance being shown as approximately heart-shaped, although it may be of other contours and still be within the scope of the invention. On the shaft 10 on each side of the cam 25 is mounted a bearing-block 26, which are shown in this instance as rectangular, and these blocks engage rectangular openings 27, formed in the two sides of a frame 28, constituting the cutter-bar driver, the frame by preference being made in two parts, held assembled by a bolt 29 and a nut 30 at each end thereof, as clearly shown in Figs. 3 and 4. Passing through the frame are two stud-shafts 31, each carrying a thrust-bearing wheel 32 to bear against opposite sides of the cam 25, whereby when the cam 25 is driven through the shaft 10 reciprocatory motion will be imparted to the frame 28 and from this to the cutter-bar, as will presently appear. The boxing 17 is provided with a stud or arm 33, which extends through the yoke of the shoe 34 and is held in position thereagainst by a pin 35, between

which and the shoe is interposed a collar 36, thereby to insure easy rotation of the cutter-bar frame on the projection when the frame is tilted to adjust the cutting mechanism thereof with relation to the ground. Below the projection 33 and in the end of the boxing 17 is an orifice 37, through which projects a two-part arm 38, the members of which constitute the terminals of one end of the frame 28, the extremities of the arms 38 being each provided with a socket-bearing 39 to engage with a ball-head 40 on the inner end of the cutter-bar. Passing through the members of the arm 38 is a bolt 41, carrying a nut 42, the outer face of which latter is serrated or toothed, the serrations to be engaged by a cotter-pin 43, seated in an opening in the end of the bolt, thereby to hold the nut from turning on the bolt when the bearing 39 has been properly adjusted with relation to the ball-head 40. The finger-bar 44 and shoe 34 may be of any usual or preferred construction; but from a standpoint of simplicity of construction and material increase in strength the shoe is by preference cast of a single piece of metal, as clearly shown in Figs. 1 and 2.

Carried by the yoke of the shoe 34 is a bracket 45, (shown in detail in Fig. 6,) the bracket being secured to the yoke by bolts or other equivalent form of fastening device passed through openings 46 at the base of the bracket. This bracket is provided with a series of horizontally-disposed openings 47, to be engaged by the intumed end 48 of the balancing-spring 49, and with openings 50, to be engaged by bolts 50^a, passed through the up-turned end of the runner 50^b of the shoe, as shown in Fig. 12. The bracket is also provided with an offset 51, by which to permit insertion through one of the series of openings 47 of the end of the balancing-spring, the said end being provided with an orifice 52, through which is passed a cotter-pin 53 to hold the spring properly secured to the bracket.

The balancing-spring holds the cutter-bar at the proper operative plane and will be so adjusted, as to tension, as to prevent the said bar from swinging below that plane, whereby objectionable frictional contact between the shoe and the ground will be obviated. This spring also aids in lifting the finger-bar and its associated mechanism and connections when the parts are to be brought to a vertical position, as by the action of the spring the weight of the bar and its parts is transmitted to the lower end of the shaft-casing 16, the upper end of which, as before stated, is swiveled to the shaft 7.

The bevel-gear 8 in operation also tends to lift the lower end of the casing 16, thereby still further reducing the frictional contact between the shoe and the ground, causing thereby an increase in the traction and power

of the machine, thereby rendering unnecessary the employment of the carrying-springs usually employed.

The bracket is further provided with an outward-extending orificed lug 54 to be engaged by a downturned toe or projection 55 at one end of a brace-rod 55^a, the projection being held against separation from the lug by a cotter-pin 55^b, the other end of the rod having a threaded connection with a tubular offset 55', carried by a two-part collar 56, working in a bearing 57 on the sleeve 16, the two members of the bearing being held assembled by bolts 58 and nuts 59, as clearly shown in Fig. 7. The brace-rod 55^a serves effectively to brace the finger-bar against rearward yield under the operation of the machine, while by reason of the collar 56 the finger-bar and the cutter-bar-actuating mechanism may be raised to throw the finger-bar at right angles to its normal position, as is usual with machines of this character. The sleeve 16, adjacent to the offset 20, is provided with an upward-extending arm 60, which is engaged by the free end of the balancing-spring 49, and this arm is also engaged by one end of a lifting-chain 61, the other end of which is secured to an orificed arm 63, carried by the bracket 45, the intermediate portion of the lifting-chain 61 being hooked into engagement with a hook 64, carried by the lower end of a lifting-lever 65, pivoted upon the tongue 66, a rack-plate 67, secured to the tongue and engaged by a latch mechanism 68 on the lever 65, serving to hold the finger-bar and its co-acting mechanism elevated at the desired distance above the ground. To effect the lifting of the finger-bar at right angles to its normal position, a chain 69 is provided, one end of which is secured to the arm 63 of the bracket 45 and the other end is wound around a drum 70, supported in bearings 71 on the top of the tongue, the rear one of the bearings being taller than the forward one in order to tilt the operating-handle 72 of the drum a proper distance above the tongue to admit of the shaft being operated to turn the drum. To hold the drum at any desired adjustment, the same is provided with a ratchet-wheel 72^a, to be engaged by a pawl 72^b, pivoted to the tongue 66, as shown in Fig. 2, the ratchet to be readily movable to release the drum.

As a means for tilting the cutter-bar a lever 73 is provided which is pivoted to the side of the sleeve-casting 16 and has its lower end projected below the same and connected to one end of the rod 74, the other end of which projects through a lug or boss 75 on an extension 33^a of the shoe 34, this latter end of the rod being provided with two nuts 76, by which to effect proper adjustment of the rod for the work to be done. The lever 73 carries latch mechanism 77 to engage a rack-plate 78, secured to the sleeve-casting, thus to hold the finger-bar in its tilted posi-

tion. To brace the shoe against rearward movement under the operation of the machine, a draw-rod 79 is employed, one end of which is hooked or otherwise secured to a projection 80 on the shoe. The other end of the rod is bent at an angle to its length and passes through a lug 81, carried by a clevis 81^a, to which the doubletree is secured, two nuts 82, carried by the last-named end of the rod, serving to hold it adjustably connected with the clevis. The connection between the rod 79 and the clevis 81^a is such as to permit the finger-bar and its attached mechanism being thrown up at the desired angle above the ground, as will be readily understood by reference to Fig. 1.

The clutch mechanism by which the gear 8 is locked upon the shaft 7 comprises an ordinary ratchet-toothed collar 83, engaging corresponding teeth in the hub portion of the gear 8, the collar 83 being held against turning on the shaft 7 by a key 84, half-seated in the shaft-opening of the collar and in the shaft. The collar 83 is provided with a peripheral groove 85, that is engaged by a collar 86, and to the collar 86 is secured a yoke 87, having a pintle 88, by which it is secured to the intermediate portion of a spring-lever 89, one end of which is pivotally connected with the tongue, as shown in Fig. 1, and the other end extends rearward and in proximity to the operator's seat 90, whereby the operator may readily shift the lever, thus to effect clutching and unclutching when desired, pins 89^a being provided on the tongue between which the lever will spring, and thus hold it in its shifted position.

From the foregoing description it is thought that the operation of the device will be readily understood; but a general description of its operation will be given to render perfectly clear how the device operates. The machine being driven over the ground and the bevel-gear 8 being locked in mesh with the gear 9, motion is imparted to the shaft 10, thence to the cam 25, imparting by its movement rapid reciprocatory movement to the driver-frame 28 and the latter to the cutter-bar. By reason of the fact that the cam 25 is borne upon equally throughout its entire periphery by the thrust-bearing wheels 32 positive motion will be imparted to the cutter-bar without any lost motion. Should the angle of the cutter-bar with relation to the ground not be correct, this defect may readily be remedied by operating the tilting lever 73, even while the machine is in operation, and under the same provision should it be desired to lift the finger-bar above the ground it will only be necessary to operate the lever 65 for this purpose by swinging the same backward and downward parallel with the tongue. When the machine is to be driven from the field, the finger-bar is to be elevated at right angles to its normal position by turning the crank-shaft 72 to

wind the chain 69 upon the drum, as will be understood by reference to Figs. 1 and 2, the boxing moving upon the sleeve 16 as an axis when the finger-bar is thus moved.

5 Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a mowing-machine, a driven shaft, a sleeve surrounding the same, a boxing having
10 swivel connection with said sleeve and provided with a pintle extending laterally at right angles to said sleeve, and a shoe swiveled upon said pintle.

2. In a mowing-machine, a driven shaft, a
15 sleeve surrounding the same, a boxing having swivel connection with said sleeve, a reciprocatory frame within said boxing, a cam upon the driven shaft, imparting motion to said reciprocatory frame, a pintle extending
20 laterally from the boxing at right angles to the driven shaft, a shoe swiveled upon said pintle, cutting apparatus supported upon said shoe, and a flexible connection between the cutting apparatus and the reciprocatory
25 frame.

3. In a mowing-machine, the combination with the shoe having a yoke, of a boxing having a swivel connection with the yoke, a frame disposed within the boxing and provided at
30 one end with means for engagement with the cutter-bar, thrust-bearing wheels carried by the frame, and a positively-driven cam engaging the said wheels.

4. In a mowing-machine, a driven shaft, a
35 sleeve surrounding the same, a boxing having swivel connection with said sleeve, said boxing being provided with a laterally-extending pintle and with a slot below said pintle, a reciprocatory frame within the boxing having
40 one end extended through the slot in the same, a cam arranged upon the driven shaft engaging and transmitting motion to the reciprocatory frame, a shoe having swivel connection with the laterally-extending pintle of
45 the boxing, cutting apparatus supported by the shoe and connected flexibly with the extended end of the reciprocatory frame.

5. In a mowing-machine, a driven shaft, a sleeve surrounding the same, a boxing having
50 swivel connection with said sleeve and provided with a slot in one end thereof, a pintle extending laterally from said boxing above said slot, a shoe having swivel connection with said pintle, a cam, a reciprocatory frame
55 operated by said cam and mounted in the boxing, said frame being composed of side members having ends extended through said slot and terminating in semispherical cups, a cutter-bar supported by the shoe and having
60 an arm terminating in a ball, and means for tightening the semispherical cups of the driver upon said ball.

6. In a mowing-machine, a wheel-supported axle, a driven shaft, a cam upon the same, a

sleeve surrounding the said shaft and having
65 hinge connection with the axle, a boxing provided with a slot and having swivel connection with the outer end of the sleeve, a pintle extending laterally from said boxing at right
70 angles to the driven shaft, a shoe having swivel connection with said pintle, cutting apparatus supported by the shoe, a cam-driven reciprocatory frame within the boxing having arms extending through the slot in the
75 same, and a ball-and-socket connection between said cam-driven frame and the cutting apparatus.

7. In a mowing-machine, the combination with the shoe and the finger-bar, of a boxing having a swivel connection with the said bar, 80 a shaft journaled in suitable bearings in the boxing, a frame connected at one end to the cutter-bar and provided with aligned rectangular openings, thrust-bearing wheels carried by the said frame, and a cam carried by the
85 shaft with which the said wheels coact.

8. In a mowing-machine, the combination with the shoe, of a bracket-frame secured to the heel end of said shoe, said bracket-frame comprising a plate having an offset portion
90 bolted to the shoe, a plurality of perforations, an upwardly-extending bracket and a rearwardly-extending bracket, said brackets being perforated for connection with supporting means connected with the frame of the ma- 95 chine.

9. In a mowing-machine, the combination with a shoe, of a bracket-frame bolted to the rear end of said shoe and having an offset portion provided with a rearwardly-extending
100 arm, and a runner connected adjustably with said bracket-frame and extending forwardly under the shoe.

10. In a mowing-machine, a sleeve constituting a shaft-casing and having hinged con- 105 nection with the frame of the machine, a boxing having swivel connection with said sleeve, a shoe having swivel connection with said boxing, a collar swiveled upon the sleeve and having a threaded socket, and a brace-rod con- 110 nected at one end with the heel end of the shoe and at the other end with the threaded socket of the swiveled collar.

11. In a mowing-machine, a sleeve constituting a shaft-casing having hinge connection 115 with the frame and provided near its free end with an oblique rearwardly-extending threaded socket and a brace-rod having threaded connection with said socket and having hinge connection at its opposite end with the frame 120 of the machine.

12. In a mowing-machine, a sleeve connected with the frame, forming a shaft-casing and provided near its front end with an upstand- 125 ing arm, a boxing having swivel connection with the outer end of said sleeve, a shoe connected with said boxing, an arm connected with and projecting upwardly from said shoe,

and a spring connecting said arm with the upstanding arm of the sleeve.

13. In a mowing-machine, a sleeve connected with the frame, constituting a shaft-casing and having an upstanding arm near its outer end, a boxing having swivel connection with the outer end of said sleeve, a shoe connected with said boxing, a bracket connected with and extending upwardly from the heel end of said shoe, a balancing-spring connecting said bracket with the upstanding arm of the sleeve, and means for adjusting the swiveled boxing on its axis.

14. In a mowing-machine, a sleeve connected with the frame and provided with an upstanding arm, a boxing having swivel connection with the outer end of said sleeve, a shoe having swivel connection with said boxing at right angles to the connection of the latter with the sleeve, a balancing-spring connecting the shoe with the upstanding arm of the sleeve, a chain having its ends connected with the sleeve and with the heel end of the shoe, and a hooked adjusting-lever connected with an intermediate point of the chain, said chain and lever serving to gage the expansion of said balancing-spring.

15. In a mowing-machine, the combination with a shoe carrying a bracket and a sleeve supporting the cutter-bar-actuating mechanism, an equalizing-spring secured at one end to the sleeve and having its other end adjustably connected with the bracket, a lifting-chain having one end connected with the bracket and its other end to the sleeve, and a lifting-lever in engagement with the chain.

16. In a mowing-machine, a swiveled sleeve, a boxing turning upon the sleeve and carrying the shoe and the cutting mechanism, and cutter-bar-actuating mechanism carried by the boxing and comprising a frame carrying antifriction-bearings and a shaft journaled in the sleeve and having a cam engaging said bearings.

17. In a mowing-machine, a swiveled sleeve, a shaft housed therein and carrying at one end means for imparting reciprocatory motion to the cutter-bar, a balance-spring connected with the shoe and with the sleeve, a lifting-chain also connected with the shoe and with the sleeve, a winding-drum, a hoisting-chain connected at one end to the shoe and having its other end passed around the winding-drum, a tilting lever, a rod connected at one end with a portion of the shoe and having its opposite end associated with the tilting lever,

and means for supporting the said sleeve in operative position under all conditions of use.

18. In a mowing-machine, the combination with a swiveled sleeve carrying the cutter-bar-actuating mechanism, a boxing turning about the sleeve and a shoe having swiveled connection with the boxing, of a brace-rod having one end connected with the shoe and the other end connected with a collar on the sleeve, the connection being such as to permit the finger-bar to be turned upward at right angles to its normal position.

19. In a mowing-machine, the combination of a swiveled sleeve constituting a shaft-casing, a boxing turning about said sleeve, a shoe having swivel connection with the boxing and supporting the cutting mechanism, a yoke upon said shoe, a bracket extending from the tongue of the machine, a brace-rod having hooked connection with the yoke of the shoe and swivel connection with the bracket extending from the tongue, and means whereby the boxing may be turned upon the sleeve to elevate the cutting apparatus.

20. In a mowing-machine, the combination of a sleeve constituting a shaft-casing, a boxing turning about the sleeve and having a laterally-extending pintle, a shoe having a yoke and a laterally-perforated extension engaging and swiveled upon said pintle, a lug extending upwardly from the shoe extension, a tilting lever fulcrumed upon the sleeve, and a rod connecting said tilting lever with the lug upon the shoe extension.

21. In a mowing-machine, a sleeve constituting a shaft-casing, a boxing having swivel connection with the sleeve and provided with a laterally-extending pintle, a shoe having swivel connection with said pintle, a bracket mounted upon and extended laterally from the tongue of the machine, brace-rods connected at their outer ends with the shoe and having their inner ends connected by swivel-joints respectively with the bracket extending from the tongue and with the sleeve, and lifting means mounted upon the tongue of the machine for turning the shoe and its related parts and the boxing with which said shoe is connected upon the axis of said boxing.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

ALVIN M. THREEWITS.

Witnesses:

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CHAS. S. NEAL.