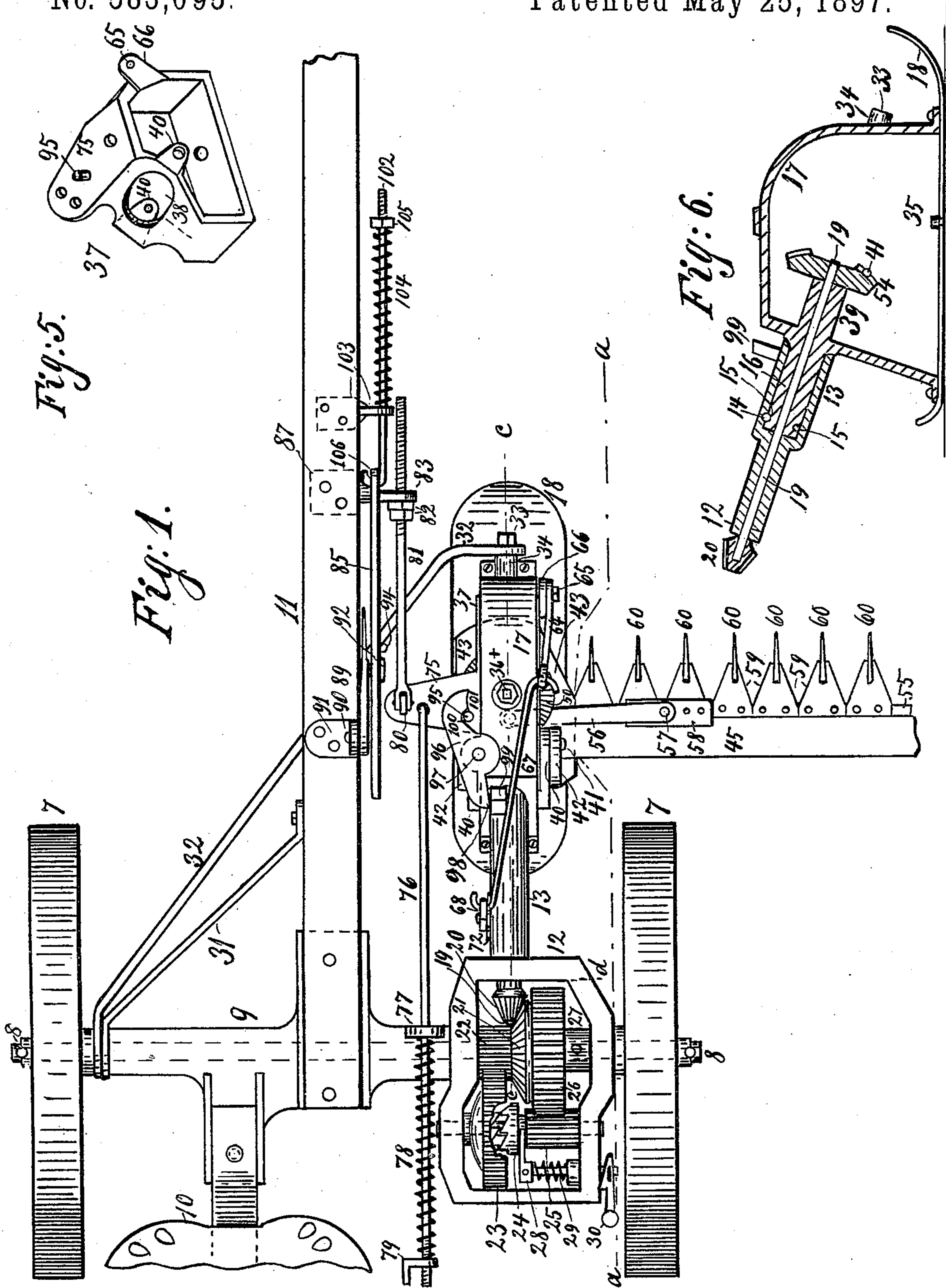


2 Sheets—Sheet 1.

No. 583,095.

Patented May 25, 1897.



WITNESSES:

B. A. Vary
D. E. Carlsen

INVENTOR:

Edwin G. Stande
BY his ATTORNEY:
A. M. Carlsen

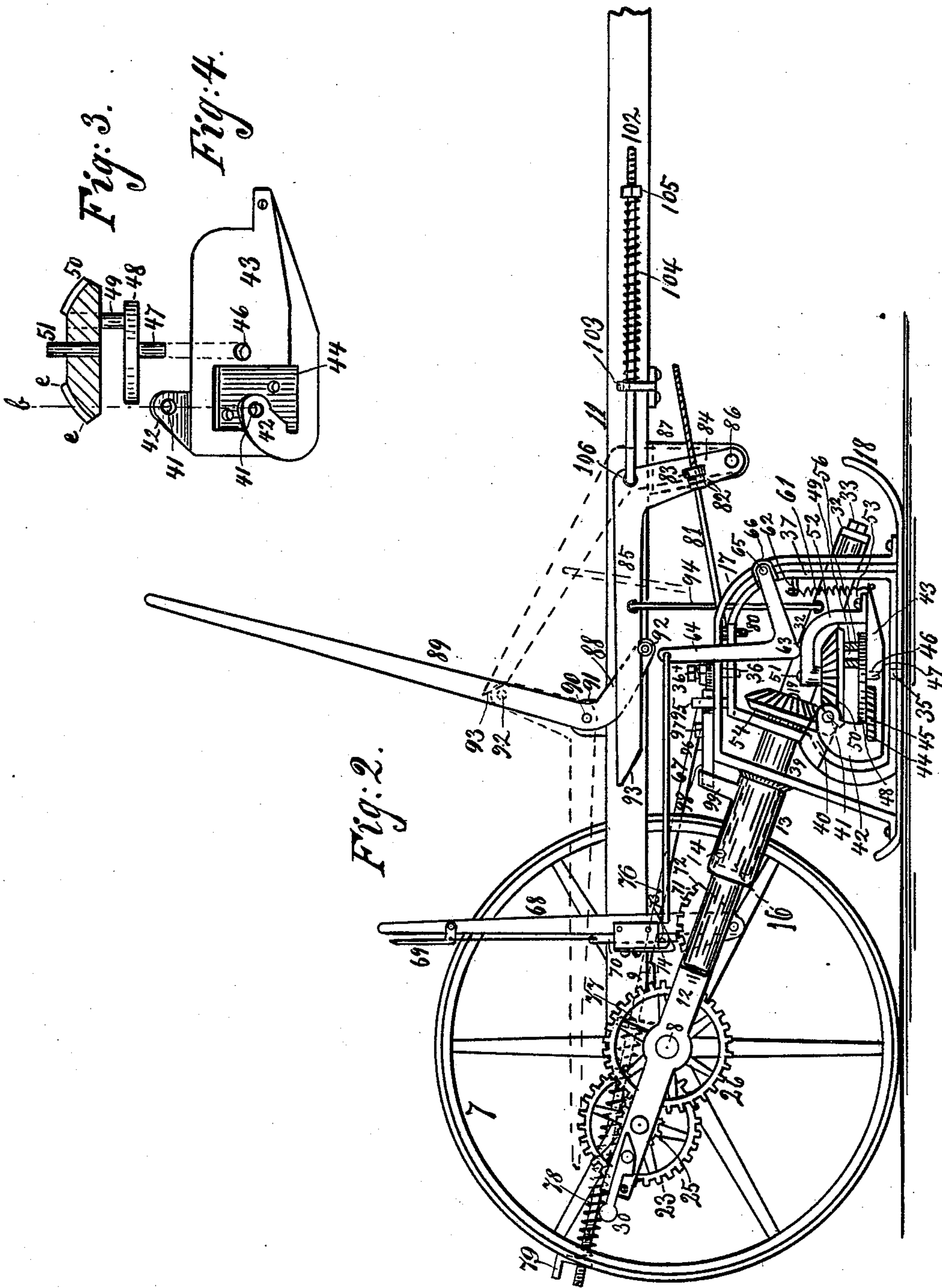
(No Model.)

2 Sheets—Sheet 2.

E. G. STAUDE.
MOWING MACHINE.

No. 583,095.

Patented May 25, 1897.



WITNESSES:

B. A. Vary
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UNITED STATES PATENT OFFICE.

EDWIN G. STAUDE, OF KEMPTON, NORTH DAKOTA.

MOWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 583,095, dated May 25, 1897.

Application filed March 27, 1896. Serial No. 585,121. (No model.)

To all whom it may concern:

Be it known that I, EDWIN G. STAUDE, a citizen of the United States, residing at Kempton, in the county of Grand Forks and State of North Dakota, have invented certain new and useful Improvements in Mowing-Machines; and I do 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, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in mowing-machines, and is a further improvement on my mowing-machine described in the United States Patent No. 546,200, which was granted to me on the 10th day of September, 1895. The main object in view is about the same as in said former invention, but the means by which the object in the present case is attained are considerably different and superior, as they insure much quicker and more absolute movement and action of the parts than in the former construction.

The objects of my invention are, first, to provide a mowing-machine which when the cutter-bar meets any object, like stumps of trees, sod, rocks, or the like obstructions, will automatically raise, pass over the obstruction, and sink or drop to the ground again, all with a sensitive and positive movement; second, to provide a mowing-machine in which the backward swinging of the finger-bar will be in a horizontal plane also when the bar is tilted, so that the fingers point above or below a horizontal line.

With these as the main objects in view my invention consists in the novel construction and arrangement of parts illustrated in the accompanying drawings, in which—

Figure 1 is a top or plan view of my mowing-machine. Fig. 2 is a side elevation of Fig. 1, with the right-hand traction-wheel, the seat and the spring and rod 76 and 78 omitted, and with the finger-bar in section, as on the line *a a*, and the pitman intersected at the crank-pin or line *c c* in Fig. 1. Fig. 3 is a partly sectional side view of the crank and wheel driving the pitman attached to the cutter-bar. Fig. 4 is a perspective detail view

of a tilting shoe adapted to carry the finger-bar and the crank in Fig. 3. Fig. 5 is a perspective detail view of a horizontally-rocking frame adapted to carry the shoe shown in Fig. 4. Fig. 6 is a sectional side view about as on the line *c c* in Fig. 1, showing the way the framework is put together from the point *d* and forward.

Referring to the various parts in the drawings by reference-numerals, 7 designates the traction-wheels, 8 the main axle, and 9 the pole-frame, journaled on the axle and carrying the seat 10 and pole 11, which parts are all of old and well-known construction, and the traction-wheels are provided with the usual pawls and ratchet mechanism, (not shown,) so as to revolve the axle 8 when the machine is drawn forward, but not when it is moved backward.

To the right of the frame 9 is journaled upon the shaft 8 the main frame 12, which has a forwardly-extending hollow arm or sleeve 13, in the front end of which is journaled and retained by the pin 14 and annular groove 15 the rear end 16 of the vertically-rocking frame 17, the bottom of which is formed with the traveling shoe or runner 18.

19 is a shaft journaled centrally in the sleeves 13 and 16 and is provided at its rear end with a bevel gear-pinion 20, which drives the shaft at about the same speed as the cutter-bar and is driven by the bevel-gear 21 and pinion 22, secured concentrically thereto and driven by the spur-gear 23, clutch 24, pinion 25, and spur-gear 26, of which the hub 27 is secured to and driven by the main axle 8. The clutch or coupling 24, coupling-fork 28, spring 29, and cam-lever 30, as well as the above-mentioned speed-increasing gear-wheels contained within the frame 12, may be of any suitable construction and arrangement.

31 is a side brace for holding the pole more rigidly in its transverse position to the axle.

32 is another oblique brace journaled with one end on the axle 8 and having its front end pivotally bolted at 33 to the boss 34 at the front of the rocking frame 17 in central line with the shaft 19, so that the frame 17 may rock on the sleeve-journal 13 16 and the pivot-joint 33 and thus allow the finger-bar to be raised and lowered at its outer end or be raised up

and folded toward the pole in driving the machine to and from the field.

Inside the frame 17 I journal on the stud 35 and the point 36 of the screw 36+ the horizontally-rocking inner frame 37, (best shown in Fig. 5,) which is adapted to rock on its journals in the horizontal plan when the frame 17 stands in its normal position. The oblong hole 38 in the frame 37 receives the projection 39 (see Figs. 2 and 6) of the frame 6 and is elongated for the purpose of allowing the frame 37 to rock as much as the finger-bar is to be allowed to swing rearward with its outer end in case it strikes an obstruction on the ground. To the side lugs 40 of the frame 37 I pivot at 41 the side lugs 42 of the tilting frame or tilting shoe 43, (best shown in Fig. 4,) which is provided with a recess 44, in which the inner end of the finger-bar 45 is secured, and near thereby is journaled at 46 the journal 47 of a crank formed of the said journal 47, the disk 48, crank-pin 49, bevel gear-wheel 50, and journal 51, of which the latter is journaled in a bracket 52, secured upon the shoe 43 by bolts, of which only one, 53, is shown in Fig. 2, but there are several of them, and the bracket is preferably made in a semicylindrical shape, so as to shield the gear-wheel 50 from grass and dirt. The bevel-gear 50 meshes with another bevel-gear 54, secured on the front end of the shaft 19 in such a position that a straight line drawn through the centers of the pivots 41, on which the shoe 43 tilts, will touch the joining point 35 of the pitch-lines of the two gears 50 and 54, as indicated by the line *b* in Figs. 3 and 4 and the pivot 41 in Fig. 6. This and the rounding or bulging of the faces of the teeth of both of said gears as between the points *c c* in Fig. 3 make it possible to tilt the shoe 43 up and down, so as to raise and lower the fingers and knives without interfering with the meshing of the said bevel-gears. The crank-pin 49 is connected to the cutter-bar 45 55 by the pitman 56 and pin 57, which is secured in the plate 58, riveted to the cutter-bar, of which 59 are the knives.

60 are the so-called "fingers," projecting from the finger-bar 45.

61 is a spiral spring attached at 62 to the frame 37 and supports with its lower end the tilting shoe 43, which it holds upward with the bracket 52 touching against the point 63 of a cam-lever 63 64, which is pivoted at 65 to the lug 66 of the frame 37 and has its upper end connected by a rod 67 to the hand-lever 68, which is provided with a finger-lever 69 and locking-bolt 70, adapted to engage the various notches 71 in the segmental bracket 72, and thus hold the shoe 43 in a more or less raised position against the resistance of the spring 61. The locking-bolt 70 is provided with two V-shaped notches 73, in which the spring-dog 74 engages and holds the bolt either in one of the notches in the bracket 72 or locked in a raised position above the bracket, as shown in Fig. 2. The

latter position allows the lever 68 to follow the motion of the lever 64 in raising up the finger-bar into its idle position. As best shown in Figs. 1 and 5, the frame 37 is at its upper edge provided with an inwardly-extending broad arm 75, to which is pivotally connected the front end of the rod 76, which is guided in the lug 77 of the frame 9, and back of said lug is encircled by a strong pushing coil-spring 78, the tension of which may be regulated by the thumb-nut 79, screw-threaded upon the rear end of the rod. To the arm 75 is further pivotally connected by a swiveling eye-stud 80 a forwardly-extending rod 81, provided with a pair of nuts 82, which by being screwed toward each other will stay tight upon any desired place of the screw-threaded portion of the rod, which slides in the eye-stud 83, swiveling in the short arm 84 of the bell-crank lever 84 85, which is pivoted at 86 to a bracket 87, secured to the pole 11, the side of which the lever clears by about an inch. In said clearing or space swings in the vertical plane the short arm 88 of a foot-shaped hand-lever 88 89, which is pivoted at 90 to the bracket 91, secured upon the pole. The short lever-arm 88 is provided with a projection 92, which engages the lower edge of the lever-arm 85, which it is adapted to lift up into the position shown in dotted lines in Fig. 2 when the lever-arm or hand-lever 89 is swung into the horizontal position shown in dotted lines, and when the two levers assume that position they are both locked by the pressure of the inclined edge portion 93 of the lever 85 against the projection 92 of the lever-arm 88, and as the lever 85 is connected by the lifting-rod 94 to the frame-brace 32 the traveling shoe 18, and all the machinery mounted on it, and which may be termed the "cutter-head," is lifted from the ground by throwing said lever 89 into the position shown in dotted lines.

In the arm 75 is further secured a peg 95, engaging the front end of a beam-lever 96, pivoted at 97 near its middle upon the frame 17, and engaging with its rear end 98 the lug 99, which projects upward from the sleeve 13 of the frame 12. The peg 95 is normally lodged in the notch 100 of the lever 96, but if the cutter-bar meets an obstruction on the ground and is thereby swung rearward the arm 75 and its peg 95 are thereby swung forward, so that the peg 95 bears against the cam edge 101 of the lever 96, which is thereby swung on its pivot 97 and, touching the lug 99, causes the frame 17 to rock on its journals, with the upper edge inward and the lower edge or shoe outward, and thus lift the outer end of the cutter-bar from the ground, so as to secure its being lifted as much or even more than the inner end of the bar, which, together with the entire cutter-head, is lifted over obstructions by the pushing of the rod 81, with its nuts 82, against the eye-stud 83, thereby lifting the lever-arm 85, rod 94, and cutter-head connected thereto as often

as the cutter-bar is swung rearward by meeting any obstructions, and when the cutter-bar has passed over the obstruction the spring 78 draws it at once back to its normal position, with the lug 66 of the inner frame 37 stopping against the front portion of the frame 17. The main weight of the cutter-head and cutter-bar is carried by the rod 102, sliding in the bracket 103, secured to the pole and the coil-spring 104, acting between said bracket and the tension-regulating nut 105, while the rear end of the rod is pivotally secured at 106 to the lever 84 85. The gears 50 and 54 may be of even size or bevel-gears of any desired difference in size, so as to decrease or increase the speed of the cutter-bar, and the beam-lever or tilting-lever 96 may be made to tilt the cutter-bar so considerably from the ground that it will by said lever action alone be lifted over all minor obstructions. Several other points may also be considerably modified without departing from the scope and spirit of my invention.

The operation may be fully understood from the foregoing description. Still it may be further observed that whenever the cutter-bar is retarded in its progress by any obstruction the frame 37 and arm 75 thereof are swung in the horizontal plan on the journal-points 36 and 47, the levers 96, rod 81, lever 84 85, and rod 94, operated so as to elevate the entire cutter-head and cutter-bar till the latter clears the obstruction, when it is returned to its normal position by the spring 78, which return motion retracts the rod 81, allowing the lever 84 85 and rod 94 to lower the cutter bar and head to the ground again, and of course the lever 96 also resumes its normal position as soon as the cutter-bar returns and brings the pin 95 into the notch 100.

The cutter-bar is run by the pitman 56, crank-pin 49, gears 50 and 54, shaft 19, pinion 20, and speed-increasing train of gear-wheels contained within the frame 12, the axle 8, and the traction-wheels 7. In driving the machine over roads the lever 89 is thrown into the horizontal position, so as to keep the cutter-head up from the ground, and the cutter-bar is raised up in the usual manner. When the last-named motion takes place, the rod 81 slides in the eye-stud 83, with the nuts 82 partly away from the stud, the spring 78 becomes partly compressed, and the locking-bolt 70, being released from the bracket 72, allows the lever 68 to swing forward enough to follow the motion of the rod 67 and lever 63 64.

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

1. In a mowing-machine, and in combination with a suitable body-frame, pole and traction-wheels, the vertically-swinging frame 12, having the sleeve 13 with the projection 99, the open rocking frame 17 journaled in the sleeve 13, and the shaft 19 journaled axially

in and extending through the journal and having the gears 20 and 54 secured upon its ends, the horizontally-swinging frame 37 pivotally secured within the frame 17 and carrying a cutting apparatus driven by the gear 54, the said swinging frame 37 having the arm 75, or its equivalent, provided with a stud, a cam-lever pivoted to the frame 17 and engaging the stud of the swing-frame 17 and the projection of the sleeve 13, so as to rock the frame 17 inward, at the top, and raise the cutting apparatus by the action of the stud against the cam-lever, substantially as specified.

2. In a mowing-machine and in connection with a suitable pole, frame, axle and traction-wheels, the combination with the finger-bar 45 and cutter-bar 55 of the tilting shoe 43, pivoted to the framework and to which the finger-bar is secured, an upright crank mounted on said shoe, a horizontally-swinging pitman connecting the cutter-bar with the crank, a bevel-gear secured to said crank and meshing with another bevel-gear operatively connected with the traction-wheels, said bevel-gear having the face of their teeth bulged toward each other and the meshing point of the teeth in central line with the pivots of the shoe, so as to allow the latter and one of the wheels to be tilted; and means for tilting and holding the shoe at various elevations with its free end, substantially as and for the purpose set forth.

3. In a mowing-machine and in connection with suitable traction-wheels, axle and framework, the combination with the vertical-rocking frame 17, moving on a runner or shoe, of a horizontally-swinging frame pivoted within the vertically-rocking frame, a shoe pivotally secured in the horizontally-swinging frame to tilt vertically with its front end, a cutting apparatus secured to and extending out from the side of the tilting shoe, a crank mounted on the shoe and operatively connected with the cutting apparatus, a pair of bevel-gears with teeth bulging toward each other, secured one on the crank and the other being operatively connected with the traction-wheels, a spring for supporting the free end of the shoe and a lever mechanism and hand-lever resisting and regulating the action of the spring and holding the shoe at variously raised or lowered positions; said inner shoe-carrying frame and cutting apparatus being yieldingly held in the normal position so that the finger-bar may swing backward should it meet any obstruction in its forward motion, substantially as and for the purpose set forth.

4. A mowing-machine having its pole or body-frame provided with a pivoted lifting-lever connected to the cutter-head a rearwardly-swinging yieldingly-held cutting apparatus pivoted in the cutter-head and a connection between the cutting apparatus and the lifting-lever, whereby the swinging of the cutting apparatus when obstructed causes the

lifting-lever to lift the cutting apparatus over the obstruction, and means for operating the apparatus, substantially as specified.

5. A mowing-machine having its pole or body-frame provided with a pivoted lifting-lever connected to the cutter-head a rearwardly-swinging yieldingly-held cutting apparatus pivoted in the cutter-head and a connection between the cutting apparatus and the lifting-lever, whereby the swinging of the cutting apparatus when obstructed causes the lifting-lever to lift the cutting apparatus over the obstruction, and means for operating the apparatus, and a spring assisting in lifting the cutting apparatus and permanently supporting most of its weight, substantially as and for the purpose set forth.

6. In a mowing-machine, the combination with the cutter-bar and horizontally-swinging frame in which it is secured, the rod 81, bell-crank lever 84 85 pivoted on the pole and operated by said rod and lifting-rod 94, connecting the bell-crank lever with the cutter-head, of the foot-shaped hand-lever 88 89 pivoted to the pole and engaging the bell-crank lever in a manner to raise it and hold it in an elevated position, and a spring for assisting in the raising of the bell-crank lever and cutting apparatus by the hand-lever, substantially as shown and described.

7. A mowing-machine having its cutter-bar secured to a horizontally-swinging and yieldingly-held frame, forming a part of the cutter-head, a lever-and-rod connection between

the swinging frame and the pole by which the cutter-head may be elevated by the swinging of the frame, a vertically-rocking frame encircling the swinging frame and being journaled in the front portion of the main frame projecting forward from the axle of the machine, a cam-lever or beam-lever pivoted to the vertically-rocking frame and engaging the main frame and the horizontally-swinging frame or projections thereon in a manner to cause the rocking frame to tilt or rock inward at its top and thus raise the outer end of the cutter-bar whenever said bar is retarded by obstructions, substantially as and for the purpose set forth.

8. A mowing-machine having its finger-bar pivoted to tilt with the fingers more or less from the ground and a spring supporting the bar in a manner permitting it to yield and turn the points of the fingers partly toward the ground in pulling the bar upward to release it from any obstruction, which the fingers may have come in contact with, and means for regulating the upward tilting of the fingers and means for lifting the finger-bar, substantially as and for the purpose set forth.

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

EDWIN G. STAUDE.

Witnesses:

ROBERT STRATTON,
W. J. BROBERG.