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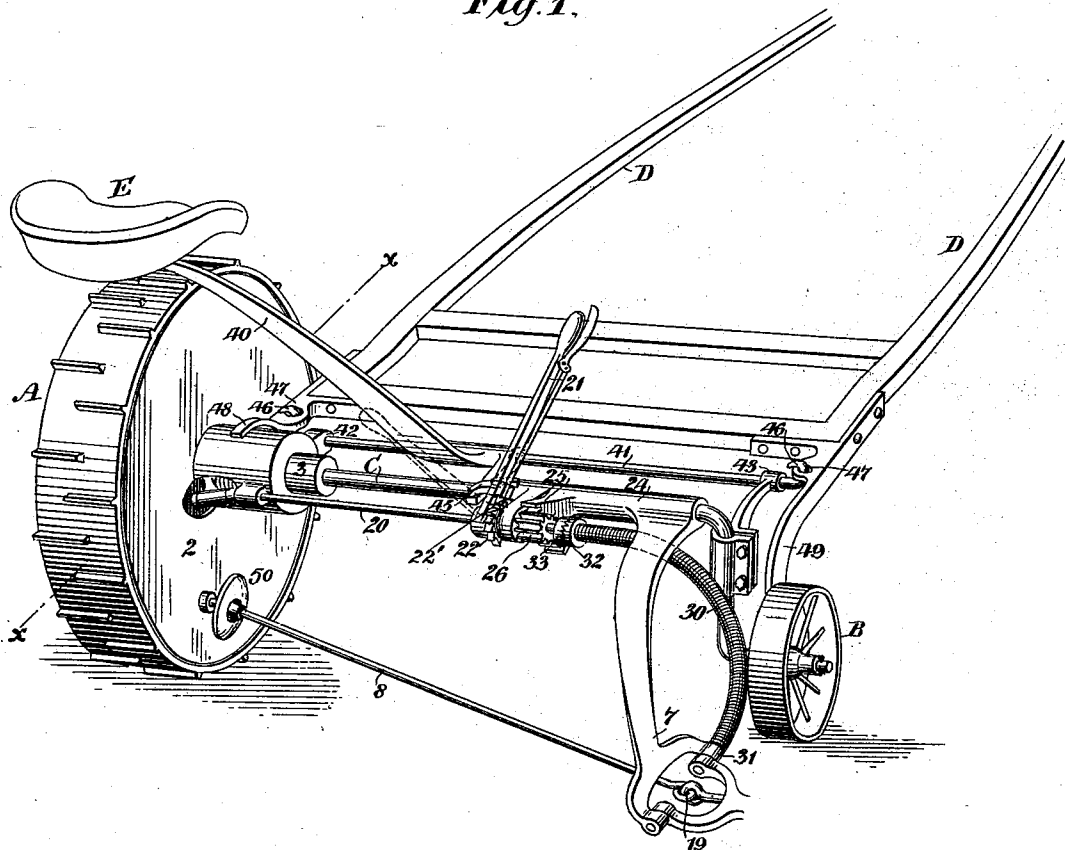
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G. BEEKMAN.  
MOWING MACHINE.

No. 509,285.

Patented Nov. 21, 1893.

*Fig. 1.*



WITNESSES:

*Edward Thorpe*  
*Engene Lucas*

INVENTOR

*Gerard Beekman*  
BY  
*Henry P. Parker*  
ATTORNEY

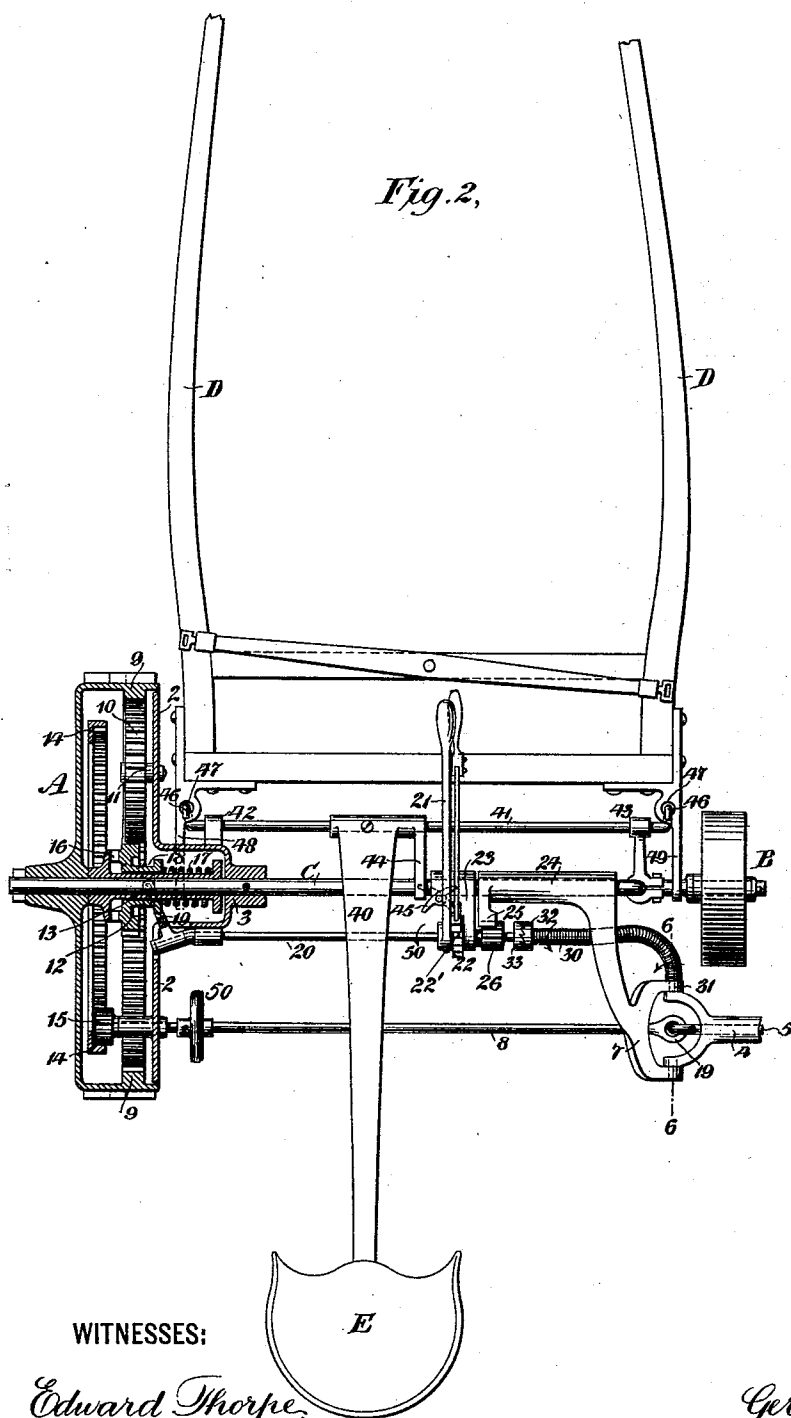
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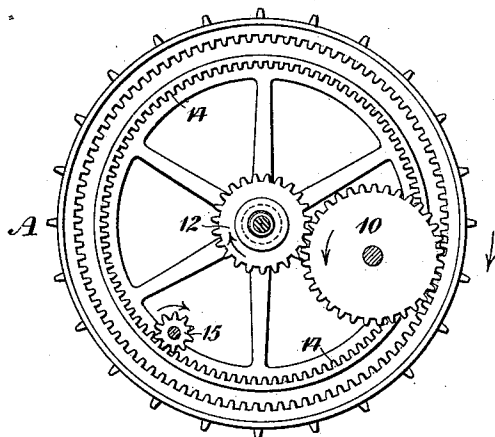
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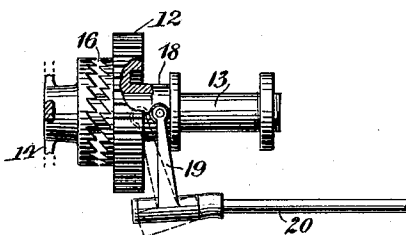
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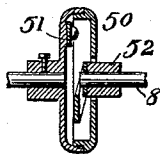
*Fig. 3.*



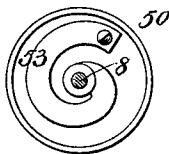
*Fig. 4.*



*Fig. 5.*



*Fig. 6.*



WITNESSES:

*Edward Thorpe.*  
*Eugene Lucas.*

INVENTOR

*Gerard Beekman.*  
BY  
*Henry F. Thorpe.*  
ATTORNEY

# UNITED STATES PATENT OFFICE.

GERARD BEEKMAN, OF NEW YORK, N. Y.

## MOWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 509,285, dated November 21, 1893.

Application filed July 18, 1892. Serial No. 440,310. (No model.)

*To all whom it may concern:*

Be it known that I, GERARD BEEKMAN, a citizen of the United States, residing in the city, county, and State of New York, have invented certain new and useful Improvements in Mowing-Machines, of which the following is a specification.

My invention relates to rear cut mowing machines in which the cutter bar is flexibly jointed to the frame of the machine to render it movable and adjustable with reference to the ground; and said invention is applicable in its chief features to any suitable or well known form of cutting mechanism.

The objects of my invention are to concentrate the parts; to facilitate the manipulation of the machine; and to promote the safety of the operator.

To these ends my invention consists in a machine embodying certain various novel characteristics such as are hereinafter fully described and pointed out in the appended claims.

Referring to the accompanying drawings in which similar characters of reference indicate corresponding parts throughout the several views: Figure 1, is a perspective view looking from the rear of the machine; Fig. 2, a plan view taken partly in horizontal section on the line  $x, x$ , Fig. 1; Fig. 3, an interior face view of the gear wheels illustrating their connections; and Fig. 4, a detail view illustrating a part of the mechanism used for throwing the cutting devices into or out of driven connection with the traction wheel of the machine. Fig. 5, is a detail sectional view; and Fig. 6, an interior face view of flexible shaft coupling herein employed.

My invention is illustrated herewith as embodied in a single traction wheel machine, although not so limited; parts of the same being capable of adaptation to the employment of two traction wheels.

A, represents a single traction wheel at one side of the machine; B, an idle supporting wheel at the opposite side of the machine; and C, the axle which is non-rotary and comprises the main bar of the frame.

D, D, represent the shafts or other draft device by which the machine is drawn over the ground, and to which the frame of the ma-

chine is suitably connected, but may be automatically disconnected as hereinafter described.

The traction wheel A, turns freely upon the axle C, and is constructed of a hollow shell inclosing the speed gearing of the machine. The wall 2, closing the inner side of the shell is stationary, being fixed by its hub 3, to the axle C, and the said stationary wall 2, com- poses a frame upon which certain parts of the gearing within are mounted.

4, represents the cuttersupporting bar; and 5, the shaft of the cutter. For convenience I illustrate herein a rotary shaft 5. The cutter supporting bar 4, is flexibly jointed in line with the axis 6, 6, to the yoke of the arm or drag bar 7, trailing from the frame of the machine. In the axis 6, 6, of the flexible joint the cutter shaft 5, is universally jointed as indicated, to the shaft 8, so as to permit the lifting of the cutter bar in the manner hereinafter described, without interference by such draft.

The traction wheel A, is provided at its interior with a circumferential rack 9, and this rack 9 propels the spur gear 12, by the agency of a transmitting gear 10, pivoted on a stationary gudgeon 11. The spur gear 12, is concentric with and turns freely about the axle C. Interposed between the axle C, and the spur gear 12, there is a rotary sleeve 13, which also turns freely, and bears a spur gear 14, having an internally toothed rim. The extremity of the shaft 8, which is supported in the stationary plate 2, bears a pinion 15, driven from the internally toothed spur gear 14.

Connection is established or interrupted between the gears 12 and 14, by means of the clutch 16, composed of a series of separable interlocking teeth on the adjacent faces of the said gear 12, and the hub of said gear 14; and the said gear 12, is capable of retraction longitudinally upon the sleeve 13, in order to effect a separation of the said interlocking teeth. A spring 17, is provided to hold the interlocking teeth together, and the said teeth are moreover beveled so as to form ratchets as indicated in Fig. 4, and thus cause rotation to be transmitted through the clutch in one direction only, and thereby permit the backing of the machine without actuating

the cutter; the beveled teeth disengaging automatically by compression of the said spring 17, and the sliding of the grooved hub of the wheel 12 on the sleeve 13. The gear 12, is provided with a circumferential groove at 18, and within this groove the extremities of a yoke 19, are fitted so as to carry the gear 12 longitudinally with it when retracted by an angular motion from the position shown.

The groove 18 should be wide enough to allow play for the yoke 19, when the cutter bar is lowered to the ground for cutting, in order to insure the automatic action of the ratchet teeth 16 as described, and yet allow the action of the yoke in disengaging the gearing when the shaft 20 is rotated. For this purpose the yoke 19 approximates the inner side of the wide groove 18 at all times, except in the automatic action of the ratchet teeth 16 when the machine is backed—Fig. 4. The yoke 19, is caused to move by the partial rotation of the operating shaft 20. As a most convenient means of imparting the desired motion I illustrate the hilt of the yoke 19, provided with a sleeve, and the extremity of the shaft 20 provided with an oblique wrist fitting to rotate freely within such sleeve so as to move the latter and the said yoke into different angular positions by the partial rotation of said shaft.

21, is a hand lever for operating the shaft 20; and 22 a suitable ratchet for retaining the lever 21, in any desired position by means of its pawl 22'.

23 is a fixed bracket projecting from the axle C, supporting the shaft 20.

The drag bar 7, bearing the cutter is mounted upon the axle C turning freely thereon. The sleeve 24, of the drag bar is provided with a toothed segment 25, with which a pinion 26, fixed to the operating shaft 20, engages, so as to determine the position of such drag bar, and the vertical distance of the inner end of the cutter supporting bar 4, from the ground accordingly, by the adjustment of the hand lever 21.

30, is a flexible shaft for establishing rotative connection between the extremity of the operating shaft 20, and the trunnion of the cutter bar having a bearing 31 in the yoke of the drag bar. By means of the operating shaft 20 and flexible shaft 30 the cutter bar may thus also be raised at its outer extremity in an arc about the axis 6, 6, by the same motion of the lever 21 which actuates the inner end of such cutter bar, whereby the machine is thrown out of gear; the two motions occurring simultaneously. The flexible shaft 30 is composed of a coiled spring and possesses torsional resiliency, the degree of which is determined by the adjustment of the interlocking disks 32, 33, upon one another, which may be retained in position by means of a set screw or other suitable means. An additional function is thereby assigned to the shaft 20, of counteracting the weight of the cutter bar while the latter is depressed, and

causing it to pass freely over the irregularities of the ground when the machine is in motion.

The seat E, for the operator is supported by its arm 40, upon a cross bar 41 supported in bearings 42, 43, and part of the weight of the seat is received by a heel 44, resting on the axle C. A pawl 45 is provided to retain the seat in position if desired. When the pawl 45, is in disuse, the draft device D, of the machine will become automatically detached by the draft of the horses or other power in event of the operator being accidentally unseated. To this purpose the extremities of the cross-bar 41 are provided with hooks 46, fitting the loops or holes 47, in the draft device D. The latter has rearwardly projecting yokes 48, 49, which fit the axle C, or surrounding parts thereof, at either side of the frame, and in co-operation with the hooks 46, 46, hold the draft device D in rigid connection with the machine as long as the seat E is in normal position. Should the rider accidentally become unseated while the machine is cutting, the draft upon the shaft D counteracted by the back draft of the machine will be sufficient to draw the hooks 46, 46, forward in opposition to the weight of the empty seat E, raising the latter and causing the said hooks to become disengaged by the turning of the cross-bar 41 on its longitudinal axis, thereby reversing the said hooks and causing them to point forward, thus releasing connection between the draft device and the machine, allowing the latter to stand.

The action upon the various parts of the machine incidental to moving the lever 21, is as follows: The effect of the first motion backward of the lever 21, and its shaft 20, corresponding to the direction of the arrow 50, is to raise the outer end of the cutter supporting bar 4, and the inner end thereof simultaneously, but at different rates of speed from the ground; the inner end rising much less rapidly than the outer end. The clutch yoke 19, should be angularly so connected with the shaft 20, as to throw the machine out of gear by the rotation of the shaft 20 before the lever 21 shall have caused the upward angular movement of the cutter supporting bar 4, so far as to render transmission of rotation through joint 19, impracticable. The continued motion of the lever 21 causes the cutter supporting bar 4, to be raised upward and forward to an extreme position by the combined motions imparted through the flexible shaft 30, and the pinion 26; the said cutter bar moving on the axis 6, 6, and the axis of the axle C, simultaneously, until it assumes a position parallel, or nearly so, with the length of the machine, bringing the parts into suitable proximity for convenient shipment, or transportation to and from the field. The angular motion of the shaft 8 is permitted when the drag bar 7 is raised by means of a flexible shaft coupling 50, which appears

more fully in detail in Figs. 5 and 6. Said coupling is composed of a box 51 attached to one part of the shaft, and a hub 52 attached to the other part of the shaft, and projected loosely through an opening of the box, whereby lateral play is prevented. The box and hub are connected together through the agency of a flat helical spring 53, which, by its construction shown, is adapted for rotative rigidity while offering non-resistance to lateral motions when the movable part 8 of the shaft is bent upward or downward and moved inward or outward by reason of the simultaneous rotation of the universal joint 19 around the axis 6, 6, and C. The shell 2 and the outer face of the wheel A, may be radially corrugated to insure stiffness and lightness of construction.

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

1. In a mowing machine, the combination of a movable seat, and a draft device having a connection with a support for said seat, the said connection being detachable by an upward movement of the seat, substantially as specified.

2. The combination in a mowing machine, of a movable seat, a hook projecting from the movable support of the seat, and a draft device coupled to the said hook substantially as described, whereby the draft shall tend to release the draft device from the hook, by the raising of the seat.

3. In a mowing machine, the combination of a cutter supporting bar trunnioned on the machine, a cutter and means for operating the same, a torsional spring connected at one end to the trunnion of the cutter supporting bar, and provided at the other end with an adjustable lever and means for retaining the same, substantially as described.

4. In a mowing machine, the combination of a cutter supporting bar trunnioned to the machine, and a torsional spring connected to

the cutter supporting bar in the axis thereof for counter-balancing it, and means for twisting the said spring so as to raise the cutter bar about its axis at will through the agency of said spring, substantially as described.

5. In a mowing machine, the combination of a cutter supporting bar trunnioned upon an axis longitudinal to the machine, and movable about an axis transverse to the machine removed from the said cutter supporting bar, with a toothed segment and a pinion for raising said cutter bar about said transverse axis, a spring shaft for raising the said cutter bar about said longitudinal axis, and a lever for actuating said segment and pinion and spring shaft simultaneously, substantially as described.

6. In a mowing machine, the combination of a cutter supporting bar trunnioned upon an axis longitudinal to the machine, and an arm movable upon an axis transverse to the machine in front of the cutter supporting bar, with a toothed sector attached to the arm, and a lifting shaft and pinion thereon engaging with said sector, a flexible shaft connecting the lifting shaft with the trunnion of the cutter supporting bar, and a lever having a rotating device for moving the cutter bar upon the said longitudinal and transverse axes simultaneously and supporting the same when so moved, substantially as described.

7. In a mowing machine, the combination with a movable cutter supporting bar and a movable rotary shaft for driving a cutter, of a shaft journaled in a fixed bearing, and a coupling consisting of a boxing on one of said shafts and a hub on the other of said shafts and projected loosely through an opening in said box, and a helical spring attached at its extremities to said boxing and hub, substantially as specified.

GERARD BEEKMAN.

Witnesses:

EUGENE LUCAS,  
H. F. PARKER.