

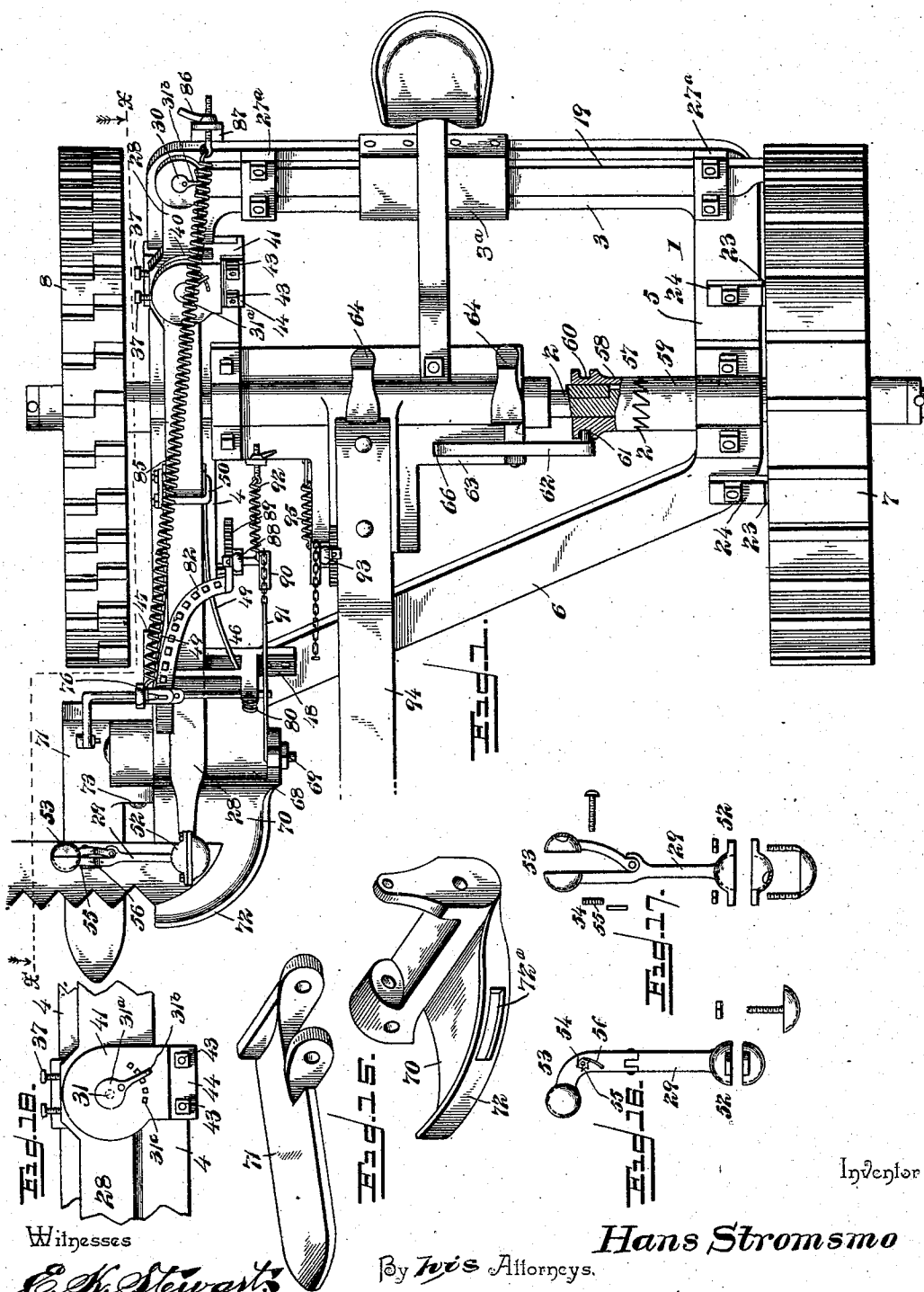
(No Model.)

4 Sheets—Sheet 1.

H. STROMSMO.
MOWING MACHINE.

No. 576,914.

Patented Feb. 9, 1897.



Inventor

Hans Stromsmo

By *his* Attorneys.

C. A. Snow & Co.

Witnesses

E. H. Stewart
J. H. Riley

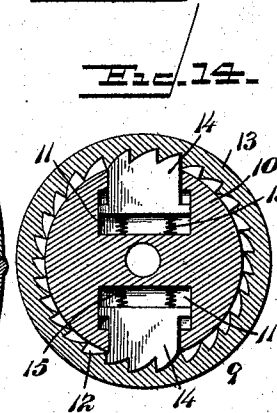
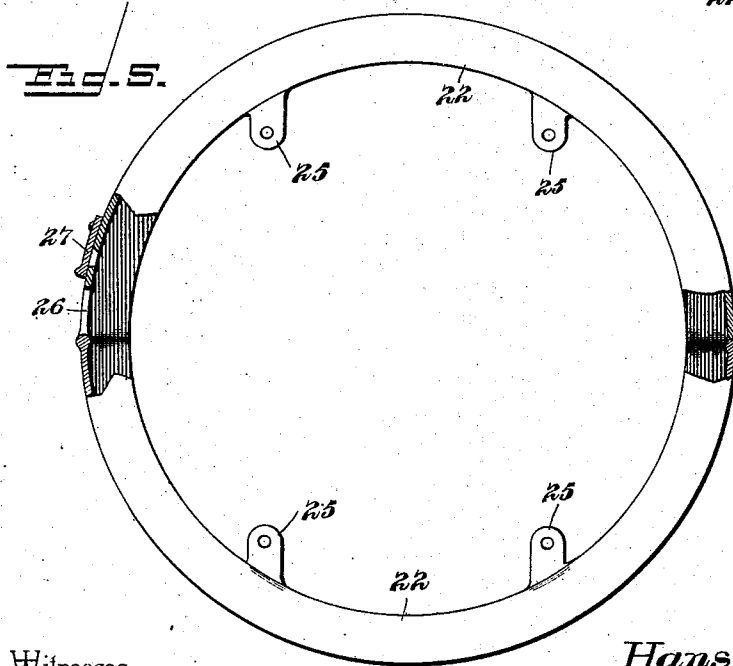
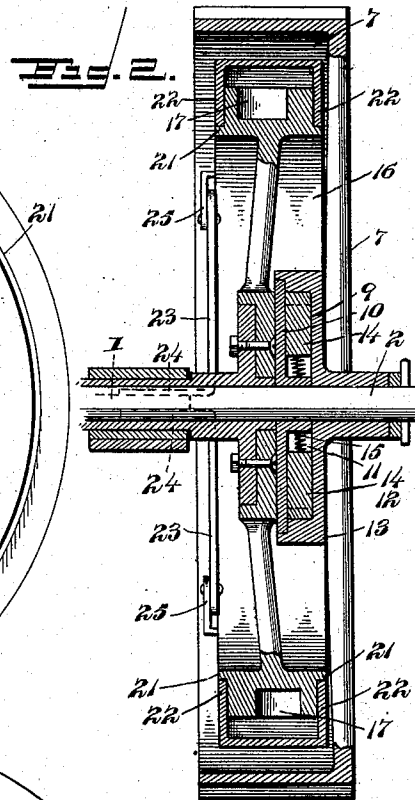
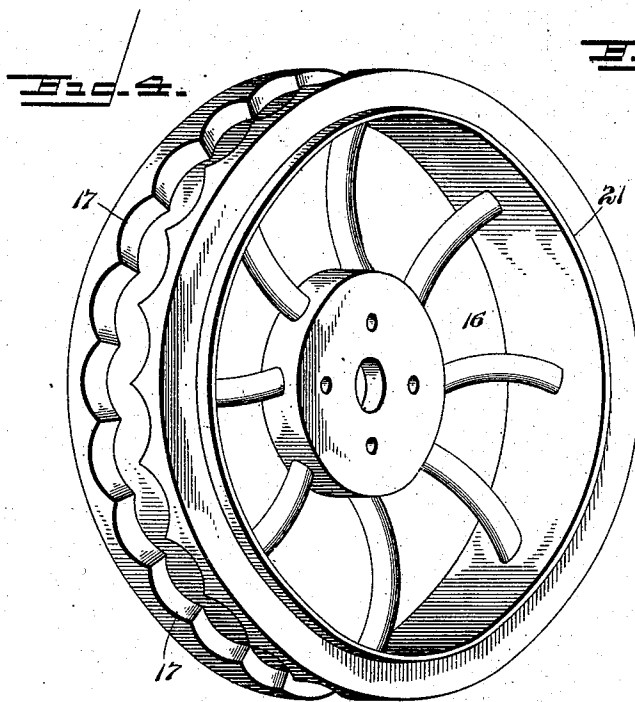
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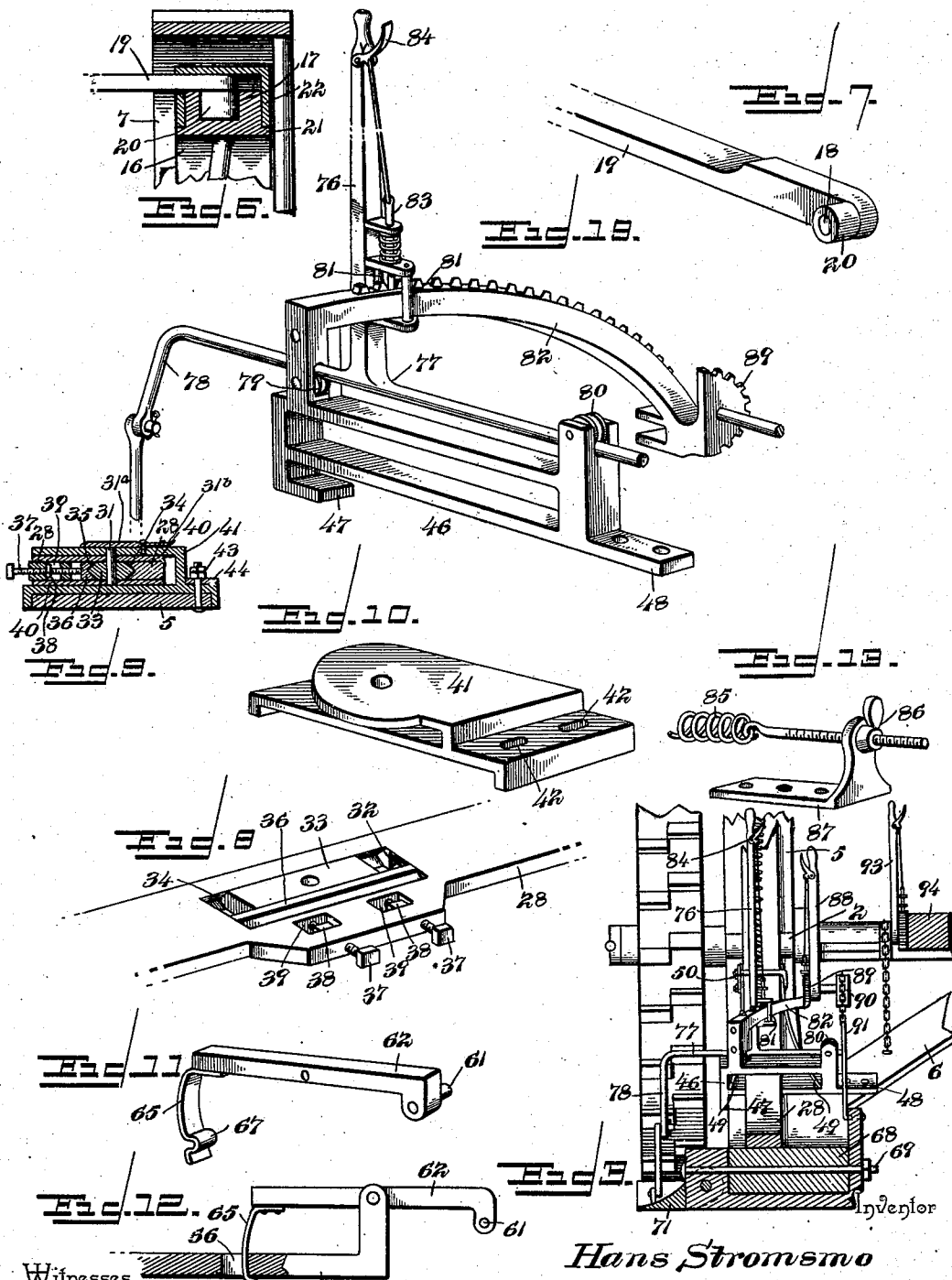
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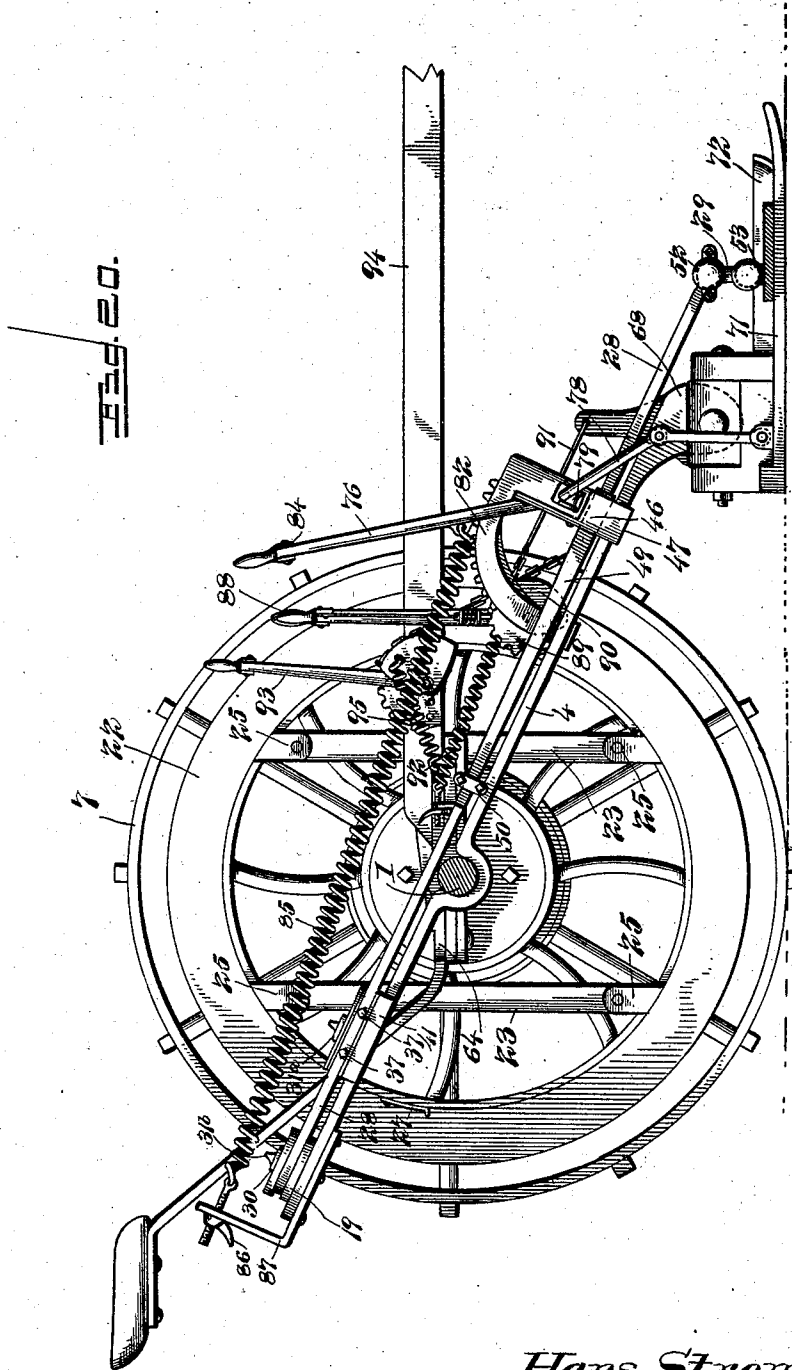
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UNITED STATES PATENT OFFICE.

HANS STROMSMO, OF HOLT, MINNESOTA, ASSIGNOR OF ONE-HALF TO SIMEON O. BAUGEN, OF BELLA COOLA, CANADA, AND THOMAS SPJELKAVIK, OF CROOKTOWN, MINNESOTA.

MOWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 576,914, dated February 9, 1897.

Application filed October 3, 1895. Serial No. 564,532. (No model.)

To all whom it may concern:

Be it known that I, HANS STROMSMO, a citizen of the United States, residing at Holt, in the county of Marshall and State of Minnesota, have invented a new and useful Mowing-Machine, of which the following is a specification.

The invention relates to improvements in mowing-machines.

10 The object of the present invention is to improve the construction of mowing-machines, to simplify the gearing for transmitting motion from the carrying-wheels to the cutting apparatus, and to enable the latter
15 to be readily adjusted to regulate the cutting or to clear obstructions or to be swung up entirely out of the way to enable the machine to pass through a narrow gateway or the like.

20 A further object of the invention is to enable the devices for transmitting motion from the carrying-wheels to the cutting apparatus to be readily adjusted to regulate the stroke to suit the particular cutting apparatus employed to reciprocate the blades properly with
25 relation to the fingers or guards.

Another object of the invention is to enable the mowing-machine to be readily thrown into and out of gear or operation by the foot of
30 the driver and without requiring the use of his hands, in order that he may properly manage the draft-animals and to prevent any liability of the machine being injured should the draft-animals become frightened or unmanageable.

35 The invention consists in the construction and novel combination and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended.

40 In the drawings, Figure 1 is a plan view of a mowing-machine constructed in accordance with this invention. Fig. 2 is a vertical sectional view through one of the carrying-wheels thereof. Fig. 3 is a transverse sectional view taken through the front of the machine at one side thereof. Fig. 4 is a detail perspective view of the cam-wheel. Fig. 5 is a detail view of the guard of the cam-wheel. Figs. 6 and 7 are detail views illustrating the construction and arrangement of the forwardly-extending arm of the reciprocating bar. Figs. 8 and 9 are detail views illustrating the manner of adjusting the oscillating bar. Fig. 10 is a detail view of the bearing-bracket of the same. Figs. 11 and 12 are detail views of the foot-lever for throwing the machine into and out of operation. Fig. 13 is a detail view illustrating the manner of adjusting the counterbalancing-springs. Fig. 14 is a detail view illustrating the construction of the wheel-clutch. Fig. 15 is a detail view of the guard and the inner shoe. Figs. 16 and 17 are detail views of the cutter-bar pitman. Fig. 18 is a detail view illustrating the construction of the pivot-locking device. Fig. 19 is a detail perspective view illustrating the construction of the cam-shaped ratchet. Fig. 20 is a vertical longitudinal sectional view on line *xx* of Fig. 1.

1 designates a main frame mounted on an axle 2 and composed of a transverse rear portion or cross-piece 3, sides 4 and 5, and an angularly-disposed front cross-piece 6, extending forward from the front end of the side 5, which is shorter than the other side 4, to the front end of the latter. The main frame is provided with suitable bearings for the reception of the transverse axle, and it is adapted to tilt on the same to raise and lower the cutting mechanism to regulate the height of the stubble and to lift the cutting mechanism even with the axle to enable the mowing-machine to pass safely over obstructions such as stones, stumps, and the like without injuring any of its parts.

The axle has journaled on its ends or spindles carrying-wheels 7 and 8, connected with the axle by clutches 9, which cause the axle to rotate with the carrying-wheels when the machine moves forward and which permit the machine to be backed without operating the shaft or axle. Each wheel-clutch comprises a disk 10, fixed to the axle and provided on its inner face with diametrically-disposed recesses 11, an annular series of ratchet-teeth 12, carried by the wheel and arranged within a cap 13, formed integral with the hub of the wheel, and a pair of dogs 14, mounted in the recesses 11 and supported by coiled springs 15 and provided at their outer edges with teeth engaging those of the wheel, whereby when the machine moves forward the dogs will interlock with the ratchet-teeth of the

hub and hold the axle rigid with the carrying-wheels to produce a forward rotation of the axle, and the teeth of the dogs are adapted to permit the carrying-wheels to be moved rearward freely to avoid operating the mechanism when the machine is being backed.

The carrying-wheel 7 has its spokes arranged at the outer edge of its rim, and the rim of the wheel 7 extends inward over a cam-wheel 16 and is provided with suitable exterior projections or lugs to enable it to obtain a firm hold on the ground. The cam-wheel has its spokes slightly curved to make the wheel slightly dished, and it is provided at its periphery with a continuous cam-groove 17, receiving a forwardly-extending arm 18 of a reciprocating bar 19, whereby when the cam-wheel is rotated the bar 19 will be rapidly reciprocated. The cam-groove consists of oppositely-curved portions forming a continuous serpentine groove or passage, and the forwardly-extending arm is provided with an antifriction-sleeve 20, which fits in the cam-groove and which renders the operation of the cam-wheel frictionless.

The cam-wheel is provided at opposite sides of its periphery with outwardly-extending annular flanges 21, which fit snugly against inwardly-extending flanges of a circular wheel-guard 22, composed of two sections and supported by a bracket 23, located at each side of the axle. Each bracket consists of a bar extending above and below the main frame to form arms, and provided with a central attachment plate or flange 24, which is bolted or otherwise secured to the main frame. The terminals of the arms of the brackets or supports 23 are secured to perforated ears or lugs 25 of the upper and lower sections of the wheel-guard and support the latter in proper position around the cam-wheel.

The broad inwardly-extending rim of the carrying-wheel 7 receives the cam-wheel and its guard and prevents them from coming in contact with obstructions in the path of the mowing-machine, and the guard serves to exclude dust and dirt from the cam-groove and prevents the cam-wheel from becoming clogged or being worn through an accumulation of grit in the groove thereof. The rear end of the upper section of the guard is provided with an opening 26 to permit the reciprocation of the bar 19, and the upper section of the guard is also provided at its rear end with a suitable oil-cup 27, having a cover, and adapted to permit the cam-wheel to be readily supplied with a lubricant. The reciprocating bar 19 is disposed transversely of the main frame and is slidingly mounted in suitable guides or bearings 27^a, and it is pivotally connected to a longitudinally-disposed oscillating lever 28, which is pivoted intermediate of its ends on the side 4 of the main frame, and which is designed to be connected at its front end to a cutter-bar by a pitman 29. The pivot 30, which connects the reciprocating bar 19, is provided with a locking device to retain

it in position, and the pivot 31, which forms a fulcrum for the oscillating lever, is constructed in a similar manner.

In order to regulate the stroke of the oscillating lever 28 to adapt the actuating mechanism to the particular cutting apparatus employed, so that the cutter-bar will be given a reciprocation of the proper length, the said oscillating lever is adjustable longitudinally and is provided intermediate of its ends with a longitudinal opening 32, receiving an adjustable block 33, provided with a perforation through which passes the pivot 31. The adjustable block 33 has oppositely-beveled side edges, which are interlocked in V-shaped grooves 34 and 35. The groove 34 is formed in the reciprocating bar and is located in the inner side of the longitudinal opening 32, and the other groove 35 is provided in a clamping-plate 36, located at the outer side of the adjustable block and provided with oppositely-beveled ends fitting in corresponding grooves at the ends of the longitudinal opening 32. The block is secured at any desired adjustment by a pair of clamping-screws 37, which are arranged in threaded perforations of the oscillating lever and have their inner ends bearing against the clamping-plate 36 and forcing the same into engagement with the block 33. The clamping-screws are locked against accidental movement by jam-nuts 38, arranged on them and located within openings 39 of the oscillating bar. A pair of washers or bearing-plates 40 are arranged on the pivot 31 and located above and below the oscillating bar, and the pivotal fulcrum 31 is supported by an adjustable bearing-bracket 41, provided with an opening to receive the oscillating lever and having at its bottom depending flanges to embrace the adjacent portion of the main frame. This bracket is adjustable to accommodate itself to the adjustment of the pivot 31 and is provided with a pair of longitudinal slots 42, receiving bolts 43, which pass through the main frame and through a tie-plate 44 and have nuts arranged on their upper ends. A pair of nuts is provided for each bolt, and the contiguous faces of the main frame, the bearing-bracket, and the tie-plate are provided with corresponding grooves or corrugations to prevent the parts from slipping. By moving the pivot 31 forward or rearward the stroke or oscillation of the bar or lever 28 may be diminished or increased to effect the proper reciprocation of a cutter-bar.

The lever 28 has its front portion arranged in a transverse guide 46, which is substantially rectangular, and which is provided at its outer side with a hook 47, engaging under the outer edge of the adjacent side of the main frame, and the guide is provided at its inner side with an extension 48, which is secured to the main frame by suitable fastening devices. The reciprocating of the oscillating lever 28 is assisted and rendered noiseless by a pair of springs 49, located at the side edges of the lever 28 and diverging forwardly.

The front ends of the springs are arranged within the guide 46 and bear against the ends thereof, and the rear ends of the springs are adjustably secured to the oscillating lever by a clamp 50, which permits the springs to be adjusted forward in the event of the front ends of the springs becoming worn.

The front terminal of the lever 28 is provided with a spherical head or ball 51, which is arranged within a sectional socket 52 at the inner end of the pitman 29. The sections of the socket 52 are detachably secured together, and the outer end of the pitman is slightly curved downward to permit the upward swinging of the cutting apparatus, and it is provided with a sectional socket 53, the rear section of the socket being hinged to the front section which is formed integral with the pitman, and the two sections are secured together by a suitable fastening device 54. The fastening device 54 consists of a bolt on which is arranged a nut 55, having ratchet-teeth, and engaged by a spring 56, mounted on the pitman, and this construction is adapted to retain securely in the socket 53 a head or bore of a cutter-bar.

The cam-wheel is detachably connected with the axle to enable the mowing-machine to be thrown into and out of operation by a clutch 57, composed of inner and outer tubular sections 58 and 59, provided at their adjacent ends with teeth adapted to interlock with each other to connect the sections. The outer section 59 of the clutch, which is arranged on the axle, extends through the adjacent bearing of the main frame and is fixed to the cam-wheel, and the inner section 58 is keyed to the shaft or axle 2 and is capable of a limited longitudinal movement to carry its teeth into and out of engagement with the teeth of the outer section, and it is provided with an annular groove 60. The annular groove 60 of the inner section of the clutch receives a pin 61 of an operating-lever 62, which is disposed horizontally and is fulcrumed intermediate of its ends on a seat-supporting frame 63. The pin 61 is provided with a sleeve to render the operation of the clutch frictionless, and the operating-lever 62 is arranged adjacent to one of a pair of foot-rests 64, and either arm or side of it is adapted to be depressed by the foot of the operator to throw the inner section of the clutch into and out of engagement with the outer section. By this construction the driver controls the operation of the mowing-machine with his left foot and without the use of his hands, which may be employed solely for controlling the draft-animals or for adjusting the cutting mechanism, as hereinafter described. The inner end of the foot-lever 62 is provided with a depending spring 65, secured at its upper end to the foot-lever and passing through an opening 66 of the seat-frame 63 and provided at its lower end with a bend 67. The bend forms a shoulder which is adapted to engage the upper or lower face of the seat-

supporting frame to secure the foot-lever against accidental movement to retain the sections of the clutch in and out of operation or engagement.

Any suitable seat may be provided, and the main frame is designed to be equipped with a suitable covering or casing 3^a to protect the reciprocating transverse bar from the feet of the operator to prevent the latter from coming in contact with the bar 19.

The main frame is provided at its front with a transverse eye 68 and has hinged to it by a transverse pintle 69 a guard or shield 70, adapted to protect the inner end of the pitman and designed to be arranged slightly above the inner shoe 71 out of contact with the ground. The guard or shield is substantially quadrant-shaped and is provided at its back with a groove to receive the eye of the main frame and has perforated lugs at the ends of the eye 68 for the reception of the pintle 69. An upwardly-extending flange 72 is arranged at the front and inner sides of the guard or shield 70 and is provided with an opening 72^a to permit the reciprocation of the cutter-bar. The outer lug of the shield or guard is provided with a perforation extending longitudinally of the mowing-machine and receiving a longitudinally-disposed pintle 73, which hinges the shoe to the shield or guard and connects the same with the main frame.

The shoe swings on its pivot or pintle to raise the cutting apparatus from a horizontal to a perpendicular position, and the guard or shield is adapted to swing on its pintle to tilt the cutting apparatus to set the same properly, and the main frame is adapted to tilt on the axle to raise and lower the cutting apparatus to regulate the length of the stubble and to enable the cutting apparatus to clear obstructions, such as stumps or the like, in the path of the mowing-machine.

The cutting apparatus is swung upward from a horizontal to a vertical position by a laterally-shifting operating-lever 76, provided at its lower end with a transversely-disposed pivot 77 and having at the outer end thereof an arm 78, which is connected with the shoe adjacent to the inner end thereof by a link-rod or the like. The pivot 77, with its arm 78, forms a rock-shaft and is arranged in suitable bearings on top of the guide 46. Antifriction-rollers 79 and 80 are arranged, respectively, at the outer and inner ends of the guide and are located below and above the pivot 77. The operating-lever 76 is provided with a pair of rollers 81, disposed longitudinally of the lever and journaled between suitable arms thereof and forming with the same an opening to receive a cam-shaped ratchet 82, mounted on the supporting-frame and extending downward, inward, and rearward from the front thereof. The front or upper end of the cam-shaped ratchet is secured to the guide at the outer end thereof, and the lower or inner end of the ratchet 82 is provided with arms arranged above and below the side 4 of the

main frame and secured to the same. When the operating-lever 76 is swung rearwardly, it is shifted or moved inwardly or laterally by the cam-shaped ratchet, thereby swinging the cutting apparatus upward with a minimum swing of the operating-lever. The power of the operating-lever 76 is greatly increased by the cam-shaped ratchet, and the lever is secured at the desired position by a spring-actuated detent 83, mounted in a perforation of the upper arm of the rollers 81 and in the registering perforations of another arm located above the rollers and arranged to engage a series of lugs or teeth located on the upper face of the cam-shaped ratchet 82. The spring-actuated detent 83 is connected with and operated by a latch-lever 84, fulcrumed upon the upper end of the operating-lever 76 and located adjacent to the handle thereof.

The raising and lowering of the cutting apparatus is facilitated by a counterbalancing coiled spring 85, connected at its front end to the operating-lever 76 and at its rear end to an adjusting-screw 86, which is passed through a perforation of an L-shaped support or bracket 87 and is engaged by a nut. The L-shaped support or bracket 87 is mounted on the main frame at the rear transverse part thereof, and the screw is adapted to be rotated to vary the tension of the coiled spring.

The tilting of the cutting apparatus is effected by an operating-lever 88, fulcrumed on a pin of a segmental ratchet 89, which is preferably formed integral with the lower end of the cam-shaped ratchet. This operating-lever 88 is provided with a spring-actuated detent for engaging the ratchet 89, and it has a latch-lever connected with the detent for disengaging it from the ratchet. A quadrant 90 is mounted on the lever 88 and has a peripheral groove to receive the adjacent portion of the connection between the lever 88 and the inner lug of the guard or shield. The connection 91 may consist of a link-bar or a chain or the like, and the tilting operation is facilitated by a spiral spring 92, connected at its front end with the lever, and at its rear end with the main frame by an adjusting-screw. The inner lug of the guard or shield is extended upward sufficiently to form an arm tilting the cutting apparatus.

The main frame is raised and lowered to adjust the cutting apparatus vertically by a lever 93, fulcrumed at one side of the pole or draft-beam 94, and connected with the main frame by a chain, and the weight of the main frame is counterbalanced by a coiled spring 95, connected with the lever 93 and with the seat-supporting frame. The lever 93 carries a spring-actuated detent for engaging a ratchet on the pole or draft-beam, and a latch-lever similar to those of the levers before described is provided for disengaging the said detent from the ratchet of the draft-beam or pole.

The locking devices of the pivots 30 and 31

consist of a pivoted plate 31^a, adapted to cover its pivot to hold it in place and capable of being swung to one side to expose the pivot to permit it to be removed. The pivoted plate is provided with a resilient stem or shank 31^b, adapted to engage a series of stops or projections to secure it against accidental movement.

It will be seen that the mowing-machine dispenses with the ordinary construction of gear-wheels, and that simple and effective means are provided for transmitting motion from the carrying-wheels to the cutting mechanism, and that the oscillating bar or lever may be readily adjusted to regulate the stroke of the cutter-bar to adapt the actuating mechanism to any kind of reciprocating cutting apparatus.

It will also be apparent that the mowing-machine may be readily driven over rough, stumpy, and stony ground without liability of any of the parts being broken or otherwise injured; that the cutting mechanism may be readily adjusted vertically or tilted, and may be conveniently swung upward from a horizontal position to a vertical position, and that the mowing-machine may be readily thrown into and out of operation by the foot of the driver.

Changes in the form, proportion, and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

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

1. In a mowing-machine, the combination of a frame, a cam-wheel, a transversely-disposed reciprocating bar connected with and actuated by the cam-wheel, an oscillating lever pivoted to the reciprocating bar and provided with a longitudinal opening, an adjustable block arranged in the longitudinal opening and provided with a perforation, a clamping-plate located within the longitudinal opening and engaging the adjustable block, clamping-screws mounted on the oscillating lever and engaging the clamping-plate, an adjustable bearing-bracket mounted on the frame, and a pivot passing through the bearing-bracket and the perforation of the adjustable block, substantially as described.

2. In a mowing-machine, the combination of a frame provided with an opening 66, an axle, a cam-wheel mounted on the axle, a clutch composed of two tubular sections arranged on the axle and provided at their adjacent ends with teeth, one of the sections being connected with the cam-wheel, and the other section being keyed to the axle, having a limited longitudinal movement to engage and disengage the other section and provided with an annular groove, a horizontally-disposed foot-lever fulcrumed intermediate of its ends on the frame and having one end engaging the groove of the movable section of the clutch, and a spring depending from the

other end of the lever, passing through the opening 66 and provided at its lower end with a bend forming a shoulder and arranged to engage the frame above or below the opening thereof, substantially as described.

3. In a mowing-machine, the combination of a frame, an axle, a cam-wheel having a peripheral cam-groove and provided at opposite sides of the same with annular flanges, a guard mounted on the frame and composed of two semicircular sections, and having inwardly-extending annular flanges, and provided with an opening, and a reciprocating bar having an arm extending through the opening and engaging the cam-groove, substantially as described.

4. In a mowing-machine, the combination of a frame, a cam-wheel having a peripheral cam-groove, brackets mounted on the frame adjacent to the cam-wheel and extending upward and downward therefrom, a circular wheel-guard having inwardly-extending flanges and inclosing the periphery of the cam-wheel, and secured to and supported by the arms of the said brackets, and a reciprocating bar actuated by the cam-wheel, substantially as described.

5. In a mowing-machine, the combination of a frame, a shoe connected with the same and arranged to swing upward and downward to raise and lower a cutting apparatus, and an operating-lever fulcrumed on the frame and arranged to swing longitudinally thereof, and connected with the shoe, and adapted to swing the same, said operating-lever being capable of a lateral movement, whereby the swinging movement of the shoe is accelerated, substantially as described.

6. In a mowing-machine, the combination of a frame, a shoe hinged to the same, an inclined cam-shaped ratchet mounted on the frame and extending inward and rearward, a lever fulcrumed on the frame and connected with the shoe and guided by the cam-shaped ratchet, and means for engaging the ratchet, substantially as described.

7. In a mowing-machine, the combination of a frame, an inclined cam-shaped ratchet mounted on the frame and extending inward and rearward, a lever guided by the ratchet and provided at its lower end with a pivot mounted on the frame and disposed transversely thereof and capable of a limited movement, an arm carried by the pivot and designed to be connected with a cutting apparatus, and means for engaging the ratchet, whereby the lever is locked at the desired position, substantially as described.

8. In a mowing-machine, the combination of a frame, a rock-shaft journaled on the frame and disposed transversely thereof, and capable of a limited longitudinal movement and provided with an arm designed to be connected with a cutting apparatus for raising and lowering the same, a lever connected with the rock-shaft, an inclined cam-shaped guide connected with the lever, and means for locking the lever against movement, substantially as described.

9. In a mowing-machine, the combination of a frame, an inclined cam-shaped ratchet mounted on the frame and extending downward and inward, a lever provided with a rock-shaft journaled on the frame transversely thereof and capable of a limited longitudinal movement, lugs mounted on the upper face of the ratchet, rollers mounted on the lever and located at opposite sides of the ratchet, and a spring-actuated detent carried by the lever and engaging the lugs, substantially as described.

10. In a mowing-machine, the combination of a frame, a guard extending in advance of the frame and hinged at its rear edge to the same and provided at its inner and front edges with an upwardly-extending flange and having an opening therein, a shoe hinged to the outer side of the guard and arranged to swing transversely of the frame, a cutter-bar, and means for reciprocating the same, substantially as described.

11. In a mowing-machine, the combination of a frame, an oscillating lever disposed longitudinally of the frame, diverging springs arranged at opposite sides of the lever and connected at their outer end with the frame, and a clamp adjustably securing the inner ends of the springs to the lever, substantially as and for the purpose described.

12. In a machine of the class described, the combination with a frame and a pivot, of a locking device comprising a pivoted plate arranged to cover one end of the pivot, and adapted to be swung aside to permit the pivot to be removed, a resilient shank or stem extending from the plate, and forming a handle, and stops arranged to be engaged by the shank or stem to secure the plate against accidental movement, substantially as described.

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

HANS STROMSMO.

Witnesses:

D. B. BAKKE,
OLE A. JOHNSRUD.