(No Model.) 5 Sheets—Sheet 1

M. M. HAZZARD.

MOWING MACHINE.

No. 577,512. Patented Feb. 23, 1897.

Fig. 1.

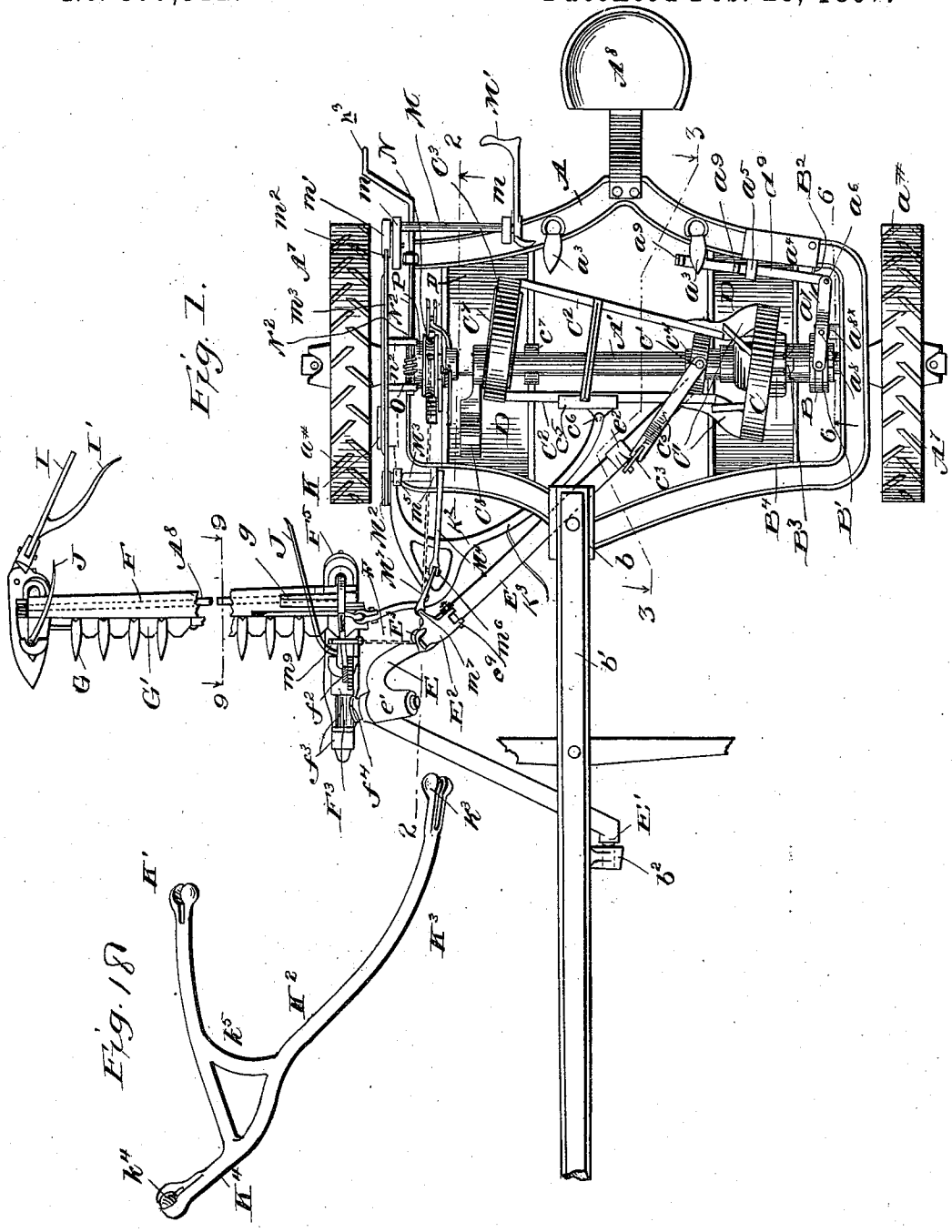

Fig. 1a.

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L. C. Hills
W. VanDoan

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(No Model.) 5 Sheets—Sheet 2.

M. M. HAZZARD.

MOWING MACHINE.

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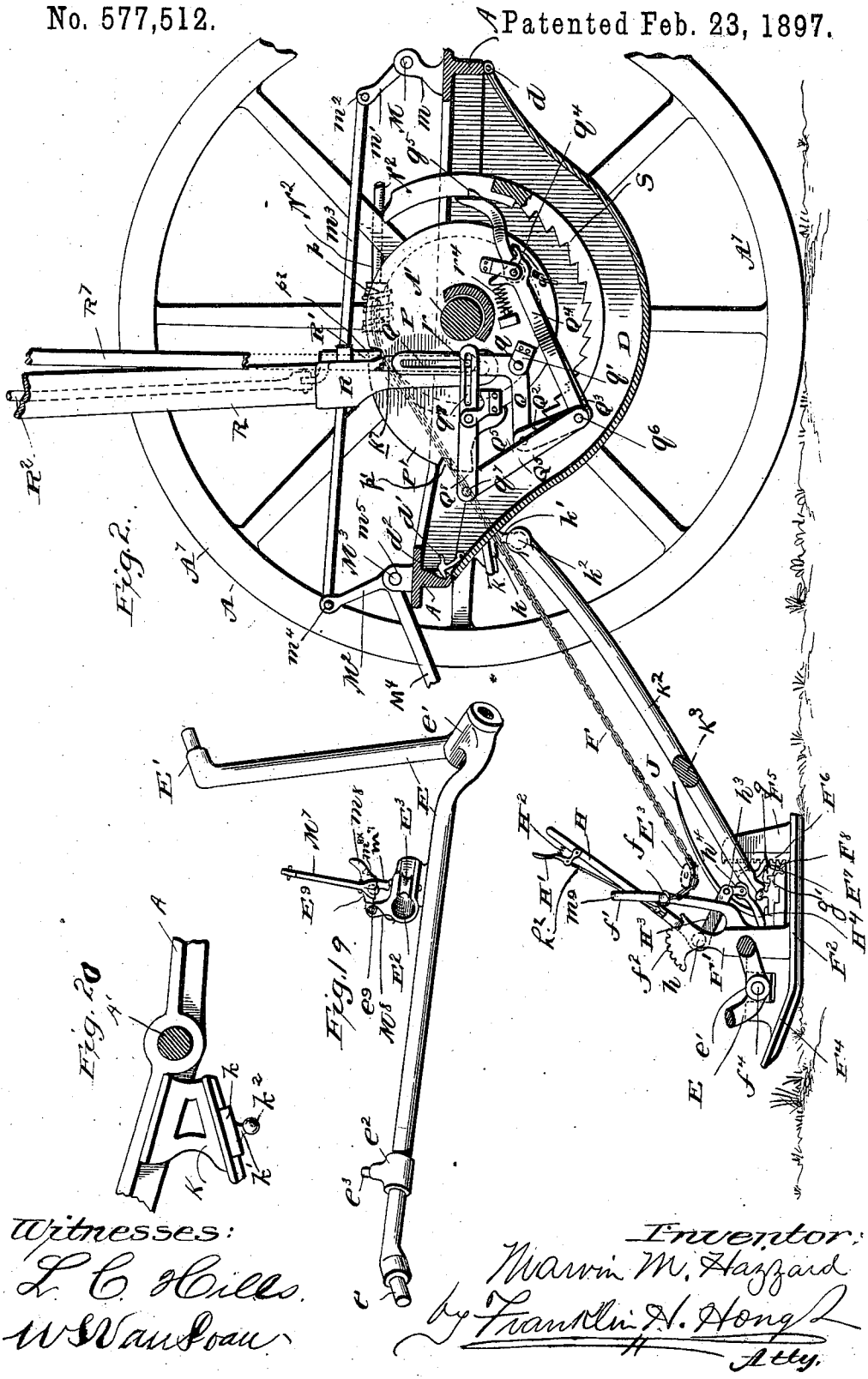

Fig. 2.

Fig. 1.

Fig. 20.

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(No Model.) 5 Sheets—Sheet 3.

M. M. HAZZARD.

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No. 577,512. Patented Feb. 23, 1897.

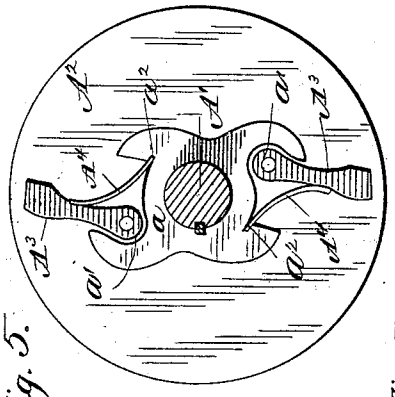

Fig. 5.

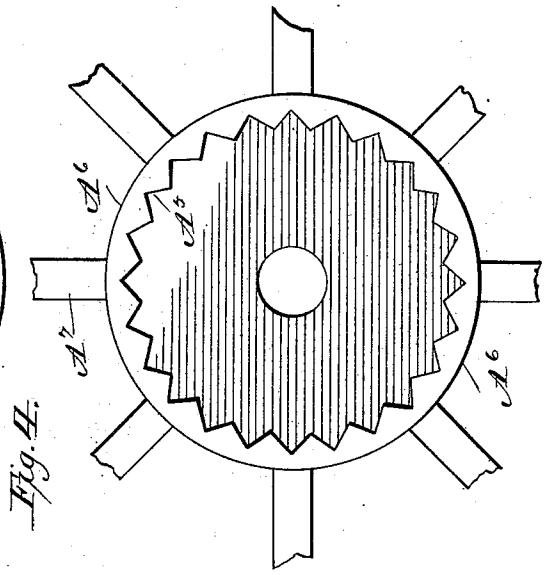

Fig. 4.

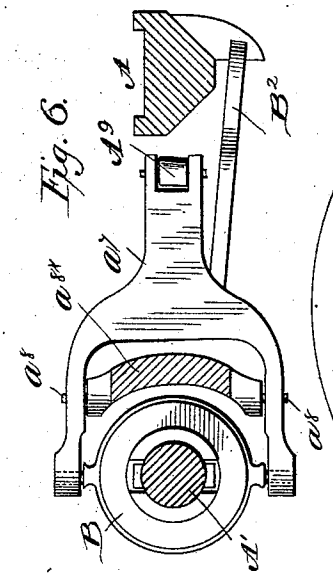

Fig. 6.

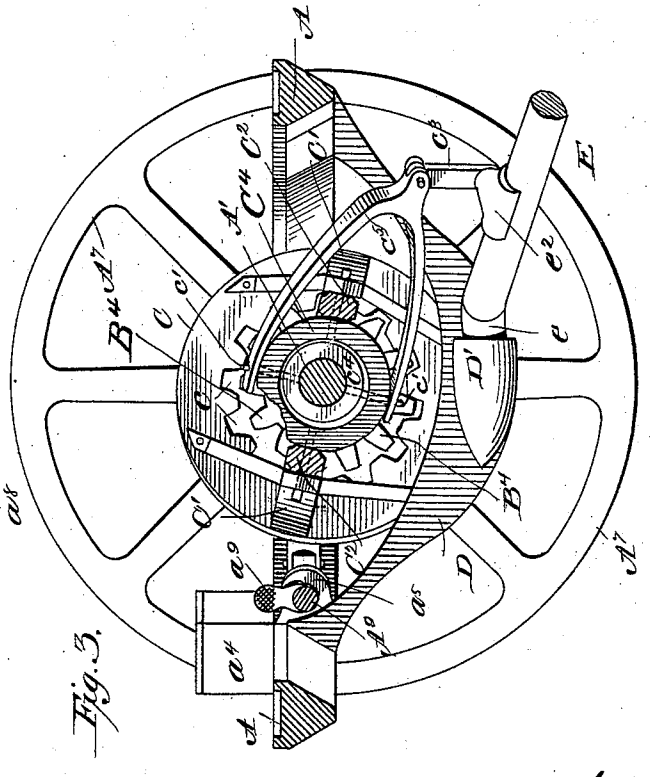

Fig. 3.

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Fig. 7.

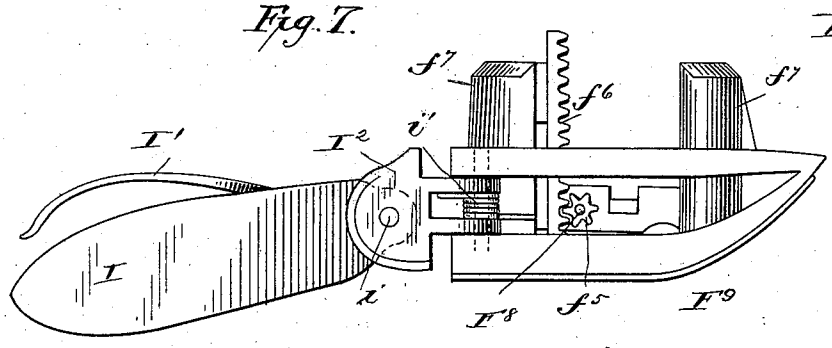

Fig. 11.

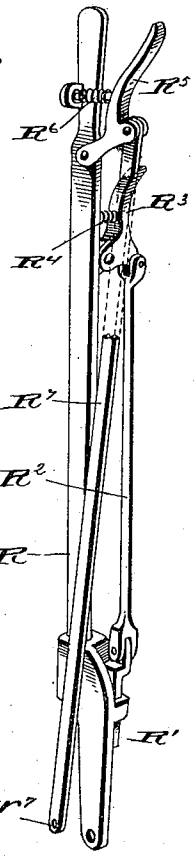

Fig. 9.

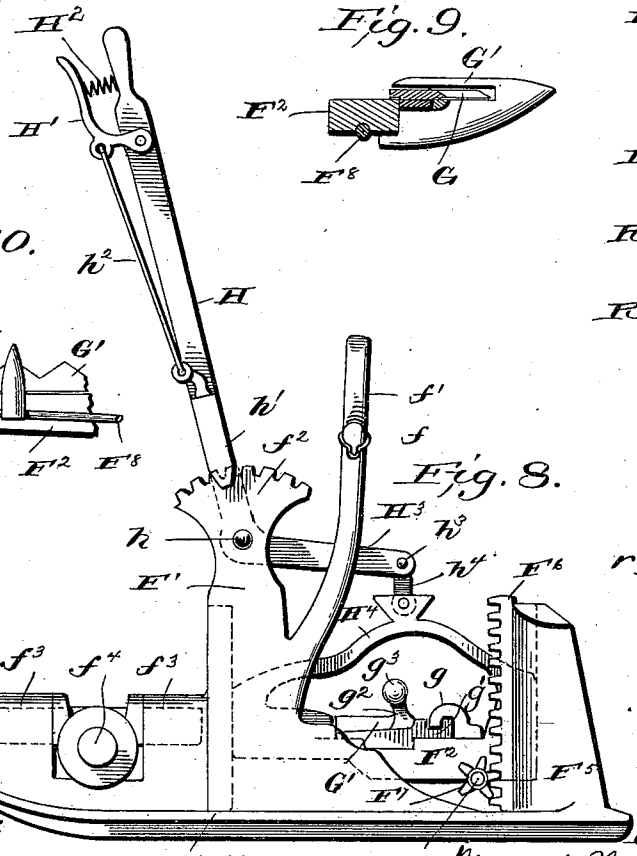

Fig. 10.

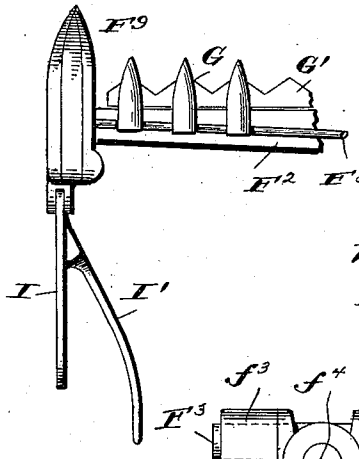

Fig. 8.

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M. M. HAZZARD.

MOWING MACHINE.

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Fig. 12.

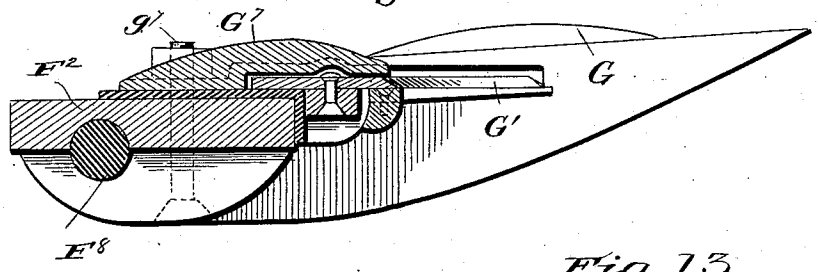


Fig. 13.

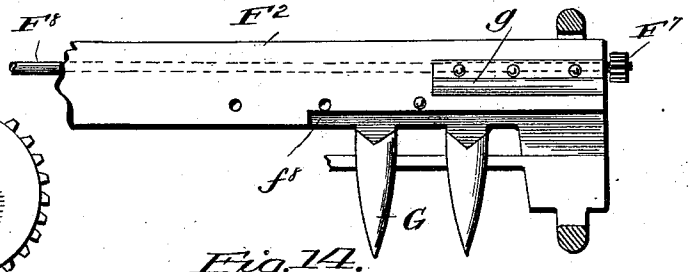


Fig. 15.

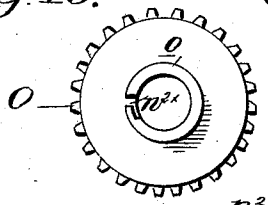


Fig. 14.

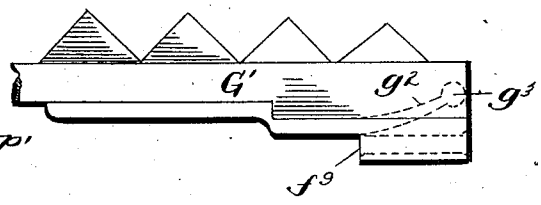


Fig. 16.

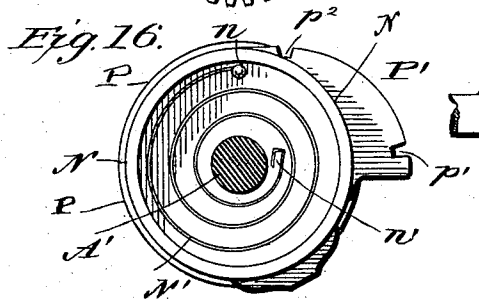
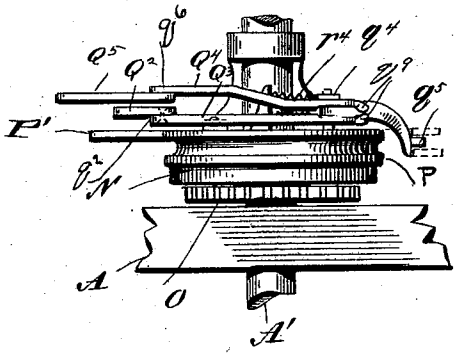


Fig. 17.



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UNITED STATES PATENT OFFICE.

MARVIN M. HAZZARD, OF NILE, NEW YORK.

MOWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 577,512, dated February 23, 1897.

Application filed September 9, 1895. Serial No. 561,967. (No model.)

To all whom it may concern:

Be it known that I, MARVIN M. HAZZARD, a citizen of the United States, residing at Nile, in the county of Allegany and State of New York, 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 of reference marked thereon, which form a part of this specification.

This invention relates to certain new and useful improvements in mowing-machines; and it has for its object, among others, to provide an improved device of this class in which provision is made for the accomplishment of a greater amount of work in less time and with the exertion of less power than by prior forms. I provide novel means for giving the reciprocatory motion to the finger-bar. I provide new devices for raising and lowering the finger-bar and its accessories, as well as for turning the same up into a substantially vertical position when not in use or for the purpose of transportation from place to place. I provide means whereby the said finger-bar and the other parts may be lowered gradually, so as not to injure the same in any way. The finger-bar is made to cut a little wider than the tread of the machine, so that it will cut the back swath clean. The main shoes are always in line with main wheels, so as to allow the drive-wheels to follow the parted swaths, so as not to tread down grass in wet places. I aim also at improvements in the details of construction and in the assemblage of parts, whereby a more compact light mower is provided, dispensing with numerous wheels and other parts and so arranging others as to render the machine as a whole less liable to get out of order and more durable.

Other objects and advantages of the invention will hereinafter appear, and the novel features thereof will be specifically defined by the appended claims.

The invention in this instance resides in the peculiar combinations of parts whereby the desired ends are accomplished, and in the novel construction, arrangement, and adaptation of parts, all as more fully hereinafter described, shown in the drawings, and then particularly pointed out in the claims.

The invention is clearly illustrated in the accompanying drawings, which, with the letters of reference marked thereon, form a part of this specification, and in which—

Figure 1 is a top plan view of my improved mowing-machine with portions broken away. Fig. 2 is a vertical longitudinal section on the line 2 2 of Fig. 1, looking in the direction of the arrows, with a portion of the V-shaped bar removed in order to better disclose some of the other parts, the roller carried by the part removed, being shown in its relative position in dotted lines. Fig. 3 is a longitudinal vertical section on the line 3 3 of Fig. 1, looking in the direction of the arrows. Fig. 4 is a detail in elevation of the hub of one of the main wheels. Fig. 5 is a similar view of the coöperating parts with the pawls. Fig. 6 is an enlarged vertical longitudinal section on the line 6 6 of Fig. 1, looking in the direction of the arrow in the latter view. Fig. 7 is an end elevation of the outer end of the finger-bar, its shoe, rack-bar, and pinion. Fig. 8 is a view looking at the opposite end of the finger-bar. Fig. 9 is a vertical longitudinal section on the line 9 9 of Fig. 1, looking in the direction of the arrows. Fig. 10 is a bottom plan of the outer end of the finger-bar. Fig. 11 is a perspective view of the compound levers which are employed for raising and lowering the finger-bar and its accessories. Fig. 12 is an enlarged vertical cross-section through the finger-bar. Fig. 13 is a detail in plan of the inner end of the finger-bar with portions in section. Fig. 14 is a similar view of the reciprocatory cutter removed. Fig. 15 is a face view of the gear-wheel removed from the main shaft. Fig. 16 is a similar view of the drum, its spring, and the notched disk, the portion having been broken away of the latter and the main shaft shown in section. Fig. 17 is a bottom plan of the drum, gear-wheel, and operating mechanism at the end of the main shaft. Fig. 18 is a perspective view of the Y-shaped bar that serves to connect the slide of the eccentric with the reciprocatory finger-bar. Fig. 19 is a perspective view of the U-bar that is employed for supporting the finger-bar and its accessories and the pulley over which passes the

chain that is used for raising the finger-bar. Fig. 20 is an enlarged sectional and side view showing one of the slides of the reciprocating mechanism, the main shaft being shown in section and the other parts in elevation.

Like letters of reference indicate like parts throughout the several views.

Referring now to the details of the drawings by letter, A designates the frame of the machine, which in cross-section is preferably substantially V-shaped, as shown in Figs. 3 and 6. In suitable bearings depending from or affixed to the end portions of this frame is journaled to revolve the main drive-shaft A′, the ends of which are extended beyond the bearings, as shown, and fast upon each extended end is a disk A^2, (shown best in Fig. 5,) and upon the outer face of this disk is the raised portion a, having the diametrically-oppositely-disposed rounded cavities or depressions a', in each of which is seated the rounded end of a pawl A^3, while springs A^4 are provided, which are arranged to bear upon the pawls, as seen in Fig. 5, the other ends of the said springs being seated in the notches a^2 in the raised portion, all as clearly shown in said Fig. 5. These pawls are adapted to engage in the teeth of the toothed ring A^5, formed in the chamber of the hub A^6 of the wheel A^7, which is loosely mounted on said shaft, the parts being so arranged that when the machine is moved backward the said wheels will revolve without revolving the shaft, but when the machine is moved forward the pawls, engaging in the teeth of this ring, will cause the shaft to be revolved with the said wheels, as will be readily understood. The wheels may be held against endwise displacement in any suitable manner. The threads or peripheries of the wheels are provided with diagonal ribs or cogs a^8, as seen best in Fig. 1, which are arranged in series extending in opposite directions, as shown, and constructed to prevent side slipping of the wheels and machine.

A seat A^8 is provided, which is suitably mounted upon the frame of the machine, as seen in Fig. 1, and upon each side of the seat and secured to the rear portion of the frame are the foot-rests a^3, adapted to receive the feet of the driver. On this rear portion of the frame, within convenient reach of the driver's seat, is a tool-box a^4 of any suitable construction.

Projecting forward from the rear bar of the frame A is a lug a^5, in which is mounted to reciprocate transversely of the machine the rod or bar A^9, which has the upwardly-extending portions a^9, between which one of the foot-rests extends, and which serves as a stop for the movement of the said rod or bar by one or the other of said upwardly-extending portions coming in contact with said foot-rest. The outer end of this rod or bar is pivotally connected, as at a^6, with the yoke a^7, which is pivotally mounted, as at a^8, on a lug $a^{8\times}$, extending inward from the end portion of the main frame, as seen in Fig. 1, and this yoke, which straddles the said lug, is connected with a collar B, which is arranged in a groove of the movable part B′ of the clutch, which movable part is mounted to slide lengthwise of the shaft by the movement of the said rod or bar A^9, as will be readily understood. A spring B^2 is provided for acting upon the yoke to normally keep the movable member of the clutch moved inward, so that it will engage with the fixed member of the clutch, so that the eccentric mechanism, which will be hereinafter described, will be actuated as the main shaft is revolved. The movable member of the clutch is mounted to revolve at all times with the main shaft, and the relatively-fixed member is loosely mounted on said shaft. This fixed member B^3 is fast upon the hub of the pinion B^4, which has a hub through which the shaft loosely revolves.

At the forward part of the frame the latter is formed with a socket b to receive the inner end of the pole or tongue b', to which the draft appliances are attached. It is provided between its ends, extending laterally from its under side, with the lug b^2, having a hole to receive a pin on the U-shaped bar, which will soon be described. At the forward end of this pole or tongue is a ball b^3, which is adapted to work between the two concave plates b^4, which are sleeved upon the singletree b^5, as seen in Fig. 1, and held thereon in any suitable manner in such a way as to permit of the ball turning therein and forming a ball-and-socket connection, as will be readily understood.

C is a ring which is provided with the teeth or cogs c upon its inner surface, as shown, and this ring is set not only eccentrically with relation to the main shaft A′, around which it is arranged, but is inclined with relation thereto, as shown clearly in Fig. 1. The pinion B^4 is designed to mesh with the teeth or cogs of this ring, as seen best in Fig. 3. Extending from the inner face of this ring are the brace-arms C′, which are secured to the arms C^2, which are connected with the eccentric ring C^3, which has a disk C^7 mounted therein, through which the main shaft loosely passes, and which eccentric disk and ring are arranged inclinedly with relation to the said shaft and parallel with the ring C, as clearly seen in Fig. 1. The arms C^2 are pivoted to a collar C^4, within which is pivoted by pins c' a hub c^4, loosely encircling the main shaft, and to this collar C^4 is also pivotally connected, as at c', the yoke C^5, as seen in Fig. 1. The outer end of the yoke is bifurcated, as shown in Fig. 1, and has pivotally connected thereto the link c^3, which is designed to be pivotally connected with the V-shaped bar, as will hereinafter be set forth.

On the front bar C^2 is a guide c^5, in which is fitted to slide easily in the direction of the length of said bar the slide C^6. (Seen in Fig. 1.) This slide has a ball or knob c^6, as shown, for its connection with the part with which it

coöperates, as will soon be described. The object of the said yoke is to steady and support the collar C^4, within which is pivoted the hub c^4.

Within the eccentric ring or strap C^3 is fitted an eccentric disk C^7, the hub of which is loose upon the shaft A′, and to which is secured a counterbalance-weight C^8, as seen best in Fig. 1.

The three-armed reciprocating bar K^2 has a ball-and-socket connection at the end of each arm, at one point with a ball integral with a slide on the bar C^2, at another end with a ball on a slide secured to the frame of the machine at K, and the third arm to a ball-lug on the reciprocating knife, so that at each revolution of the main shaft a wabbling motion is produced.

The shaft A′ has a bearing in a bifurcated arm c^7, as shown in Fig. 1, and this arm extends upward from one of the curved shields D, which are supported from the under side of the main frame and which are curved, as seen best in Fig. 2, extending under the eccentric and its counterbalance at one end and under the toothed ring and the pinion at the other end, all as clearly shown in Fig. 1. These shields may be permanently affixed, or either or both may be pivotally supported from the frame. In Fig. 2 I have shown one of them as hinged at d to the under side of the frame at the rear and at its forward end carrying a latch d' of any suitable construction adapted to automatically engage a catch or notch d^2 on the frame, as seen in said Fig. 2. This shield may be easily thrown down when it is desired to get at any of the parts for repairs or otherwise, and when thrown up the latch will engage in the notch and lock the shield in its position.

The shield D at the left of the machine is formed with a socket D′, as shown best in Fig. 3, into which is designed to engage the round projection or pin e on the end of one arm of the U-bar E, the end of the other arm E′ of which is designed to be engaged in the socket b^2 on the pole or tongue, as shown in Fig. 1, the said bar E being formed at the junction of its two arms with a socket e', as seen in Figs. 1 and 21, to receive a pin or projection on the finger-bar, as will hereinafter be set forth. On the bar E, near its connection with the socket D′, is a collar e^2, having a socket, as seen in Fig. 19, to receive the pin or connection e^3, which connects the same to the link c^3 on the yoke C^5, as shown in Fig. 1. On the same arm of the bar E is a bracket E^2, in which is journaled upon a vertical shaft a grooved pulley E^3, as seen best in Fig. 19, over which passes a chain, as shown best in Fig. 1. The chain F passes around said pulley, and one end thereof is attached to a ring or analogous provision f on the vertical arm f', rising from the upright F′ on the inner shoe of the finger-bar F^2, as seen best in Fig. 2. On the upper end of this upright is a notched segment f^2, while in front of the upright is a pair of lugs or ears f^3, in which is mounted to rock the shaft F^3, from which projects the lateral projection or rod f^4, which works in the socket e' at the junction of the arms of the bar E, as shown. These lugs or ears rise from the shoe F^4, which is supported on the end of the finger-bar. At the rear end of this shoe is the standard F^5, which is grooved upon its front face, as seen in Fig. 1, and in which is designed to work a rib or projection on the finger-bar to guide the latter in its vertical movements. The outer side of the front face of this standard is provided with a vertical rack-bar F^6, as seen best in Fig. 2, in which rack-bar works a pinion F^7, which is carried at one end of a tilting rod F^8, which is seated in a recess or groove in the under side of the finger-bar, as seen best in Fig. 12, and upon its other end carries a pinion f^5, which is adapted to mesh with the vertical rack-bar f^6 at the other end of the finger-bar. This rack-bar is carried by the shoe F^9, from which rise the uprights f^7, which are grooved, as seen in Fig. 1, and in which work the projected sides of the finger-bar to be guided thereby.

G are the guard-fingers, of known construction, supported on the finger-bar in the usual manner, and G′ is the knife-bar, which is mounted to be reciprocated upon the finger-bar and beneath the guard-fingers in the usual manner, but by novel mechanism which will soon be described. To the upper face of the inner end of the finger-bar is secured a plate g, which is grooved upon its under side, as seen best in Fig. 8, to form a guide in which is received and adapted to slide the rearward extension g' on the knife-bar, as shown in Figs. 1, 2, and 8, and upon the upper face of this extension is an arm g^2, extending in the direction of the length of the knife-bar and terminating at its outer end in a ball or knob g^3, as seen in Figs. 8 and 14. The front edge of the finger-bar is provided with a shoulder f^8, against which is adapted to engage a shoulder f^9 on the knife-bar to limit the movement of the latter in one direction.

H is a lever pivoted at h on the upright F′, as seen best in Fig. 8, and on this lever is a pawl h', designed to engage with the toothed segment f^2, as seen also in Fig. 8, and this pawl is connected by the rod h^2 with the supplemental lever H′, pivotally mounted on the lever H, near the upper end thereof, and the said rod is pivotally connected therewith between its ends, as shown, a spring H^2 being provided, which is arranged between the handles of the two levers, all as clearly shown in Fig. 8. The lever H has a horizontal arm or portion H^3, as seen best in Fig. 8, and to the outer end thereof is pivotally connected, as at h^3, the vertical link h^4, which in turn is pivotally connected with the yoke H^4, the ends of which are secured to the end of the finger-bar, so that by manipulation of the lever H the adjacent end of the finger-bar may be raised or lowered, as may be desired, to

bring the same nearer to or farther from the ground. As the lever is actuated the pinion F^7, engaging in the rack-bar, is revolved, and by reason of the pinion on the other end of the shaft or rod A^8 both ends of the finger-bar and the parts carried thereby will be simultaneously raised or lowered, and thus distortion of the parts is obviated.

On the outer end of the finger-bar is pivotally mounted the swath-board I, the pivot being shown at *i*, and the handle and guard I′ being secured thereto and extended therefrom at an angle, as seen in Figs. 1, 7, and 10. This pivot is held in the plate I^2, which, as shown in Fig. 7, is pivotally mounted at the rear of the shoe F^9, and a spring *i*′ is provided around the said pivot, as shown, so as to hold the swath-board to its place with a yielding pressure, so as to allow it to yield when meeting an obstruction and thus avoid breakage.

J are inwardly and rearwardly inclined spring-fingers, which are secured at the inner and outer ends of the finger-bar, as seen best in Fig. 1, and serving to direct the grass away from the mechanism at the ends of the finger-bar.

On the under side of the frame at the right-hand side of the machine is a guide K, in which is mounted to slide a slide or plate *k*, from which extends an arm *k*′, terminating in a ball or knob k^2, as seen best in Fig. 2, which is received in a cup-shaped socket K′ on the end of one of the arms of the substantially Y-shaped bar K^2, while the end of the arms K^3 thereof is formed with a similar cup-shaped socket k^3, as seen best in Fig. 18, to receive the ball or knob c^6 on the slide C^6, and the end of the other arm of this Y-shaped bar is formed with a similar cup-shaped socket k^4 to receive the ball or knob g^3 on the end of the arm g^2 on the inner end of the knife-bar. By this means and connection the knife-bar is reciprocated through the movement of the slide C^6 as the main wheels are revolved forward, as will be readily understood. The arms of the bar K^2 may be braced by the brace k^5, as seen in Fig. 18, if deemed necessary. By means of the ball-and-socket connections shown and described the finger-bar is at all times kept level and parallel with the ground.

To maintain the collar C^4 and yoke C^5, so as to allow of a universal movement thereof, pins *c*′ hold the yoke C^5 to collar C^4, and bolts or pins pivot said collar to the strips C^2, as will be seen in Figs. 1 and 3.

M is a transverse shaft mounted to revolve in suitable bearings *m* at the rear of the frame at one side, as seen best in Figs. 1 and 2, and to one end of this shaft is secured a foot-lever M′, arranged within convenient reach of the foot of the driver, as seen in Fig. 1, and to the other end of this shaft is connected a crank-arm *m*′, to the end of which is pivotally connected, as at m^2, one end of the rod m^3, which extends to the front of the machine, as seen in Figs. 1 and 2, and to its front end is pivotally connected, as at m^4, one end of the crank-arm M^2, which is mounted on a transverse shaft M^3, mounted in suitable bearings m^5 at the front of the frame of the machine, and to the other end of this shaft is connected the rod or arm M^4, to the front end of which is pivotally connected, as at m^6, the rod M^7, which has at its outer end a cup-shaped socket to receive a ball or knob m^7, projecting from the bracket E^2 on the bar E, all as clearly seen in Fig. 1. This ball or knob is mounted on the hinged part E^9 of the said bracket, which is hinged at e^9, as seen best in Figs. 1 and 2, and around the pivot of the said part E^9 is a spring M^8, arranged to act to normally keep the hinged part in its downward or lowermost position. The outer end of this hinged portion is turned up, as seen at m^8, and a notch $m^{8\times}$ recessed therein to form a catch to engage with a lug or analogous provision m^9 on the end of the arm *f*′, projecting upward from the upright F′ to lock the finger-bar and its attached parts in their vertical position when thrown into such position, as for the purpose of transportation. The mechanism for thus throwing the finger-bar and the parts carried thereby into such vertical position consists of the drum N, mounted loosely upon the main shaft A′, a flange P′ secured thereto with hoisting-lever and chain connections with the finger-bar, and within which drum is arranged a spring N′, one end of which is made fast to the pin or stud *n*, secured to the inner face of the drum, as seen in Fig. 16, while the other end of the spring is bent upon itself, as seen at *n*′, and adapted to go into or fit a correspondingly-shaped opening or recess $n^{2\times}$ in the hub *o* of the gear-wheel O, which is also loosely mounted on the said shaft.

N^2 is a shaft mounted in suitable bearings n^2 on the end of the frame A, and on this shaft is a worm N^3, adapted to mesh with the gear-wheel O to wind or unwind the spring, if desired to regulate the tension thereof upon the drum N, the said shaft being extended rearward, as seen in Fig. 1, and provided with a suitable handle n^3, by which it may be turned when desired.

The finger-bar cannot in any way, without disconnection, be raised from the ground without the springs being unwound more or less, the spring being provided to prevent the finger-bar from any damage or jar and to steady the same while the machine is in motion, and it will also render it easier to raise the finger-bar.

P is a grooved pulley on the shaft A′, having a pin or other means *p*, to which is designed to be connected one end of the chain F, as seen in Fig. 2 by dotted lines. This pulley has one of its heads or ends extended in the form of a flange P′, as seen best in Figs. 2 and 16, and which is provided upon its edge with the two notches *p*′ and p^2, as shown clearly in said Figs. 2 and 16. The

drum N is formed integral with the pulley P, so that the spring N′ is in effect fast at one end to the said pulley.

Pivotally mounted, as at q, on an arm or lug q', secured to the inner face of the pulley P or flange P′, is a bell-crank lever Q, the vertical arm of which is slotted, as seen at Q′, while to the end of the horizontal arm thereof is pivoted a link Q^2, which in turn is pivoted, as at q^2, to a lever Q^3, which is pivoted to a pin q^4 on the face of the pulley P and has its lower end projected under a portion of the pawl q^5, similar to the projecting portion q^9 of the lever Q^4, which extends also under an end of the pawl. On this same pivot q^4 is pivoted a lever Q^4, which at its forward end is pivoted, as at q^6, to the link Q^5. The other end of this link Q^5 is pivoted at q^7 to the horizontal lever Q^8, which is pivoted to the face of the pulley and is provided with a longitudinal slot q^8 in the part extending rearward from its pivot, all as shown clearly in Fig. 2. In the slots of the levers Q and Q^8 works a pin or projection r, carried by the rod or link R^7, mounted on a lever R, which extends upward within convenient reach of the driver on his seat, and on this lever is mounted the pawl R′, which is adapted to be engaged in either of the notches p' or p^3 of the flange P′, and this pawl R′ is connected with the link or rod R^2, connected at its other end with the supplemental lever R^3, pivotally mounted on the lever R and actuated by a spring R^4, all as seen in Fig. 11. A spring r^4 is arranged, as seen in Fig. 2, to act upon the tail of the lever Q^4. A similar spring is interposed between a similarly-shaped tailpiece on the end of the lever Q^3 and a lug on the flange P′. The supplemental lever R^5, cushioned by a spring R^6, is pivoted on the lever R and has pivotally connected thereto the upper end of the rod or link R^7, as shown in Fig. 11, and the lower end of this rod or link is provided with a hole r^7 for the reception of its pivot-pin r. The lever R is pivoted on the face of the pulley P, as shown by dotted lines in Fig. 2, and the pin or projection r is carried by the lower end of the rod or link R^7, as is seen in Fig. 2. The construction is such that when it is desired to raise the finger-bar and its attached parts into a vertical position for the purpose of transportation or otherwise the lever R is manipulated to wind the chain F′ upon the pulley P. When the finger-bar reaches its vertical position, the lug m^9 engages the notched portion m^8 on the pivoted part or latch of the bracket E^2, and the finger-bar is automatically locked in this position.

When the cutting apparatus is in its working position, the hand-lever R is locked opposite the notch p^2 and is inclined forwardly, and when it is desired to raise the cutting apparatus the hand-lever is drawn to the rear without releasing the pawl R′ from engagement with the notch p^3, thereby turning the pulley P on the axle, so that the pawl q^5 will come in contact with the rack S and lock the pulley and hold the cutting apparatus in a raised position.

To fold the cutting apparatus, the pawl R′ is released from the notch p^2 and the hand-lever is thrown forward and the pawl R′ is thrown into the notch p'. The hand-lever R is again drawn to the rear, and the pawl q^5 engages the rack S at a point forward of the position engaged by the pawl q^5, when the cutting apparatus is merely raised without being folded.

For unfolding the cutting mechanism the operator draws on the hand-lever R^5 and raises the pin r in the slot in the lever Q, thereby depressing the forward end of said lever Q and the link Q^2, which is connected with and lowers the forward end of the lever Q^3. The rear end of lever Q^3 will strike against the under side of pawl q^5, thereby releasing it from engagement with the rack S. The upper end of the hand-lever R is then moved forward until the cutting apparatus is thrown from its folded position. The hand-lever R^5 is then released, and the pawl q^5 drops into engagement with the rack S, the cutting apparatus being now in its raised position.

To lower the cutting apparatus, the operator draws on the hand-lever R^5 and thereby raises the pin r in the slot q^8 of the lever Q^8, and thereby depresses the forward end of the said lever Q^8 and Q^5, connected therewith, which is in turn connected with and depresses the forward end of the lever Q^4, thereby raising the pawl q^5 from engagement with the rack S. The hand-lever K is then thrown forward at its upper end, permitting the chain to be unwound from the pulley P, so that the cutting apparatus may rest upon the ground.

Having thus described what I at present consider the preferable form of my invention, but without limiting myself to the details thereof, what I claim as new is—

1. The combination with the axle and the clutch mechanism thereon, of the internally-toothed ring C, a pinion on the said axle designed to engage therewith, ring C^3, bars C^2 connecting said rings, an eccentric disk C^7 loosely mounted on said axle and turning on the inner rim of said ring C^3, connection between the bars C^7 and the axle, and means for holding the bars from rotating about the axle the finger-bar, a slide on one of the bars C^2 a reciprocating bar having ball-and-socket connections between the finger-bar and a lug carried on the said slide, substantially as shown and described.

2. In combination with the substantially U-shaped bar E pivoted to the main frame of the machine, and to a lug on the tongue, a yoke connected to the said bar by a link, the axle, the pinion thereon, the ring C internally toothed and designed to mesh with the teeth of the pinion, the eccentric disk C^7 and ring C^3, strips C^2 connecting rings C and C^3, the collar C^4 pivoted to the collar c^4 on the main shaft, the forks of the said yoke piv-

oted to the collar C^4, substantially as shown and described.

3. In a mowing-machine the combination with the U-shaped member pivoted to the machine as described, of a recessed bracket E^2 mounted on said U-shaped member, a pulley journaled in the recess of the said bracket, a spring-actuated portion pivoted to the said bracket and provided with a notched member adapted to engage with the projection from the finger-bar, of the link having ball-and-socket connection with said pivoted member, and means on the frame connected with the said link for raising the notched member, substantially as shown and described.

4. The combination with the shoes connected by a finger-bar, the upright posts of the shoes recessed and carrying sliding blocks, rack-bars on the front upright face of each shoe, a rod journaled in a recess on the under side of a finger-bar, pinion-wheels carried at each end of the said rod designed to mesh with the teeth of the rack-bars, one end of the finger-bar carrying a yoke which straddles the cutting-knife and an angle-lever and link connection with the said yoke, whereby the finger-bar may be raised or lowered, substantially as shown and described.

5. The combination with the shoe and its upright with notched segment, of the finger-bar, the yoke connected therewith, the lever pivoted on the upright, and the link connecting the lever with the yoke, as and for the purpose set forth.

6. The combination with the pulley with the cam-flange notched as described, of the drum, the spring and adjusting-wheel, the worm-shaft meshing therewith, of the lever R pivoted to the pulley, the levers Q^4 and Q^3 pivoted on a common pivot to a bracket on the side of the pulley, a pawl q^5 pivoted on the same pivot, its free end resting on a curved rack-bar, the corresponding ends of the levers notched and adapted to bear on the said pawl at two different locations and suitable connections between the said levers Q^4 and Q^3 and lever R, whereby the pawl may be operated, substantially as shown and described.

7. The combination with the cam-flanged pulley with spring and adjustment-wheel as described, of the lever R pivoted to the pulley, the levers Q^3 and Q^4 and pawl q^5 pivoted on a pin q^4, held in a bracket on the side of the wheel, the rear ends of said levers Q^4 and Q^3 notched with the upper projections of the notched portions adapted to bear against the end of the pawl and the lower projecting portions extending under the pawl to raise the same, of the springs bearing against a lug on the side of the pulley and the upturned ends of the levers Q^3 and Q^4, suitable connection between the said levers, whereby, when the lever R is swung, the said pawl may be raised or lowered, substantially as shown and described.

8. The combination with the pulley with its cam-flange and notches, of the drum, the spring having one end secured to the pulley, its other to an adjusting-wheel, the curved rack-bar, the lever pivoted on the flange, a pawl carried by said lever for engaging said notches, and a system of levers for actuating the pulley and flange and carrying a pawl engaging the said rack-bar, substantially as shown and described.

9. The combination with the pulley, notched cam-flange, drum and adjusting-wheel, the levers Q^3 and Q^4 and pawl, pivoted on a common pivot, the ends of the levers notched and adapted to bear against the end of the under side of the said pawl, the curved rack-bar, the lever R pivoted to the cam-flange, the angle-lever Q pivoted to the pulley on a pin q, a link Q^2 connecting the lower angled end of the said lever Q and the lever Q^3, of the lever Q^8 pivoted on a pin mounted in a bracket on the said pulley, one end of the said lever Q^8 pivoted to a link Q^5 which is pivoted to one end of the lever Q^4, and a pin r carried on a rod and adapted to work in slots in the angle-lever Q, and lever Q^8 disposed at right angles to said lever Q, of the auxiliary levers connected to the lever R for operating the pin r and pawl R′, substantially as shown and described.

10. The combination of the U-shaped bar pivoted to the frame and pole of the machine, a T-shaped shaft journaled at the angled portion of the said bar and designed to carry the finger-bar, of the bracket carried on the said U-shaped bar and a pivoted member on the said bracket, a notched portion of the said member designed to engage with a projection from the finger-bar, the integral ball-shaped lug on said pivoted member, the link M^7 having ball-and-socket connection with said lug, the crank-shaft M^3 pivoted to the main frame and connected with the link M^7 and a foot-lever having link connection with said crank-shaft M^3, substantially as shown and described.

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

MARVIN M. HAZZARD.

Witnesses:
LE GRAND VARS,
WM. H. HAZZARD.