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Mowers.

No. 198,604. **Patented Dec. 25, 1877.**

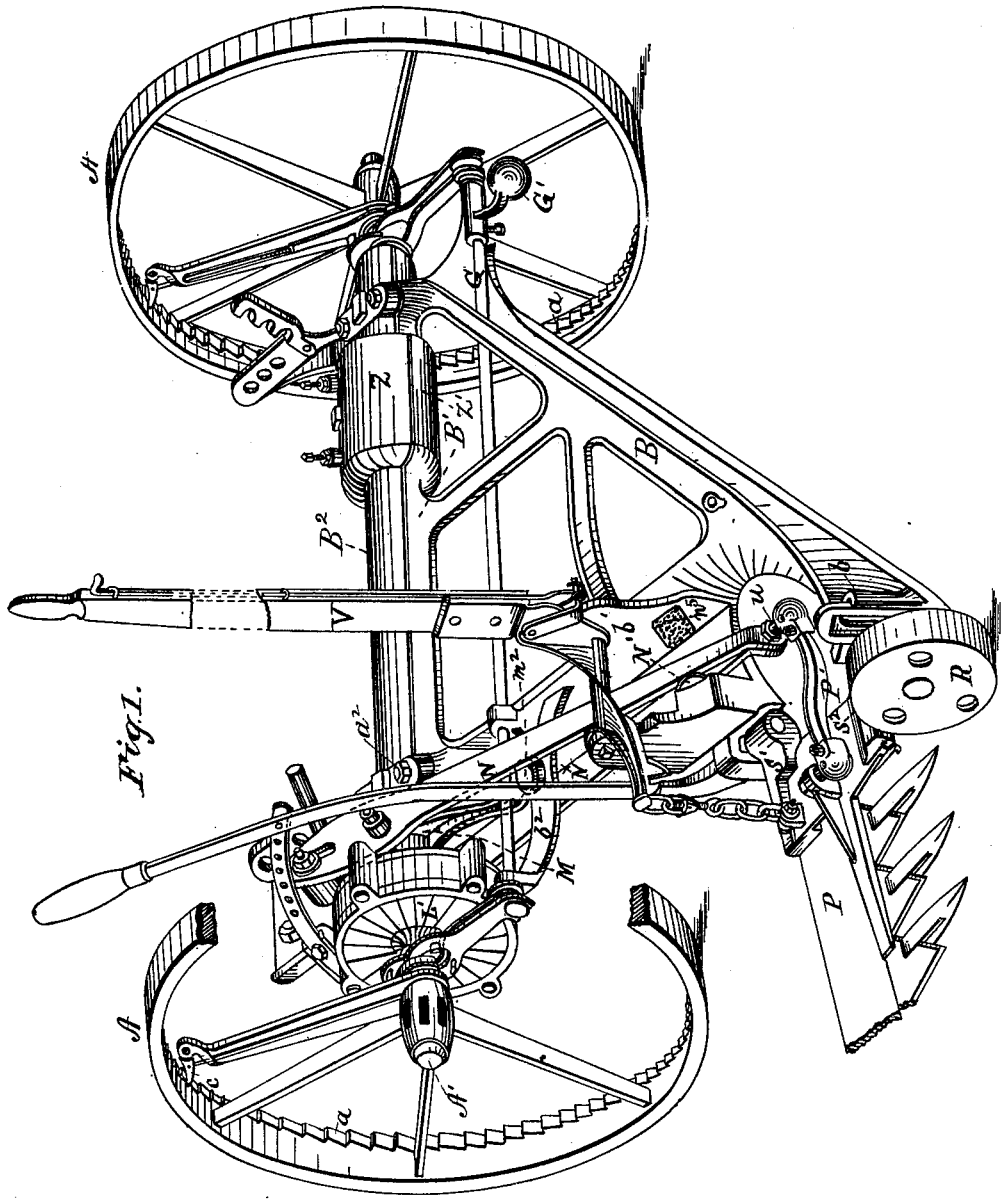

Fig. 1.

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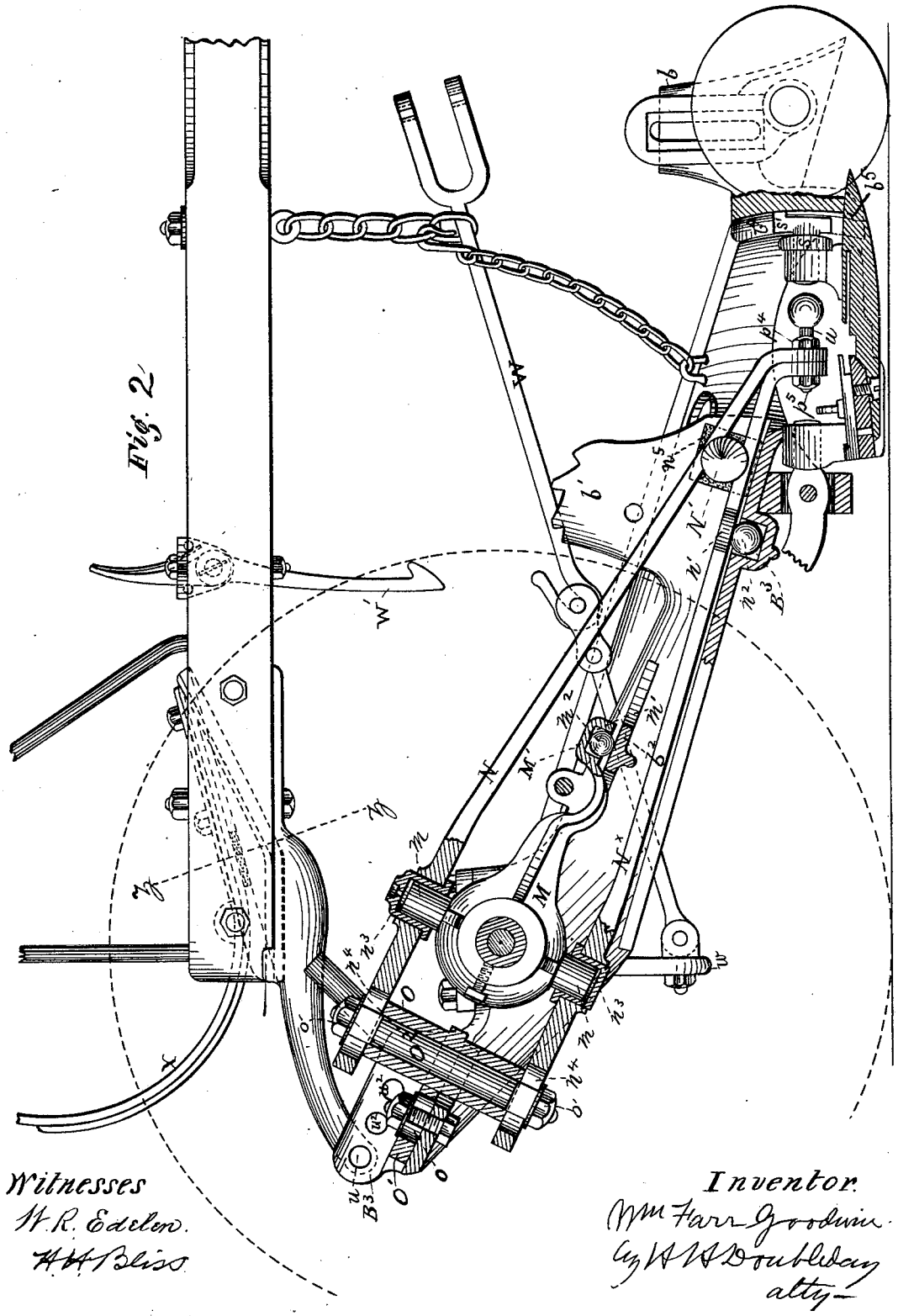
Fig. 2.



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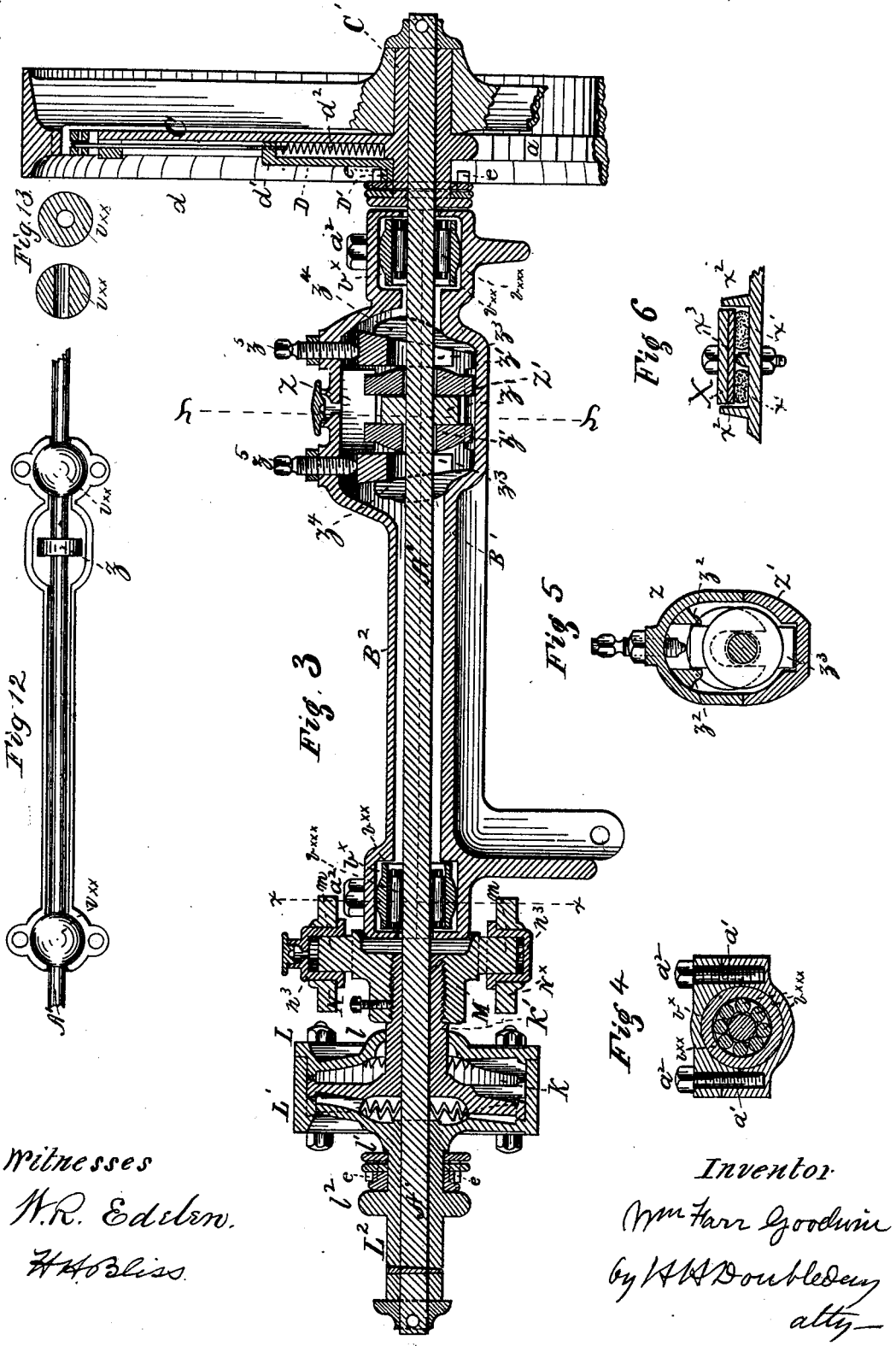

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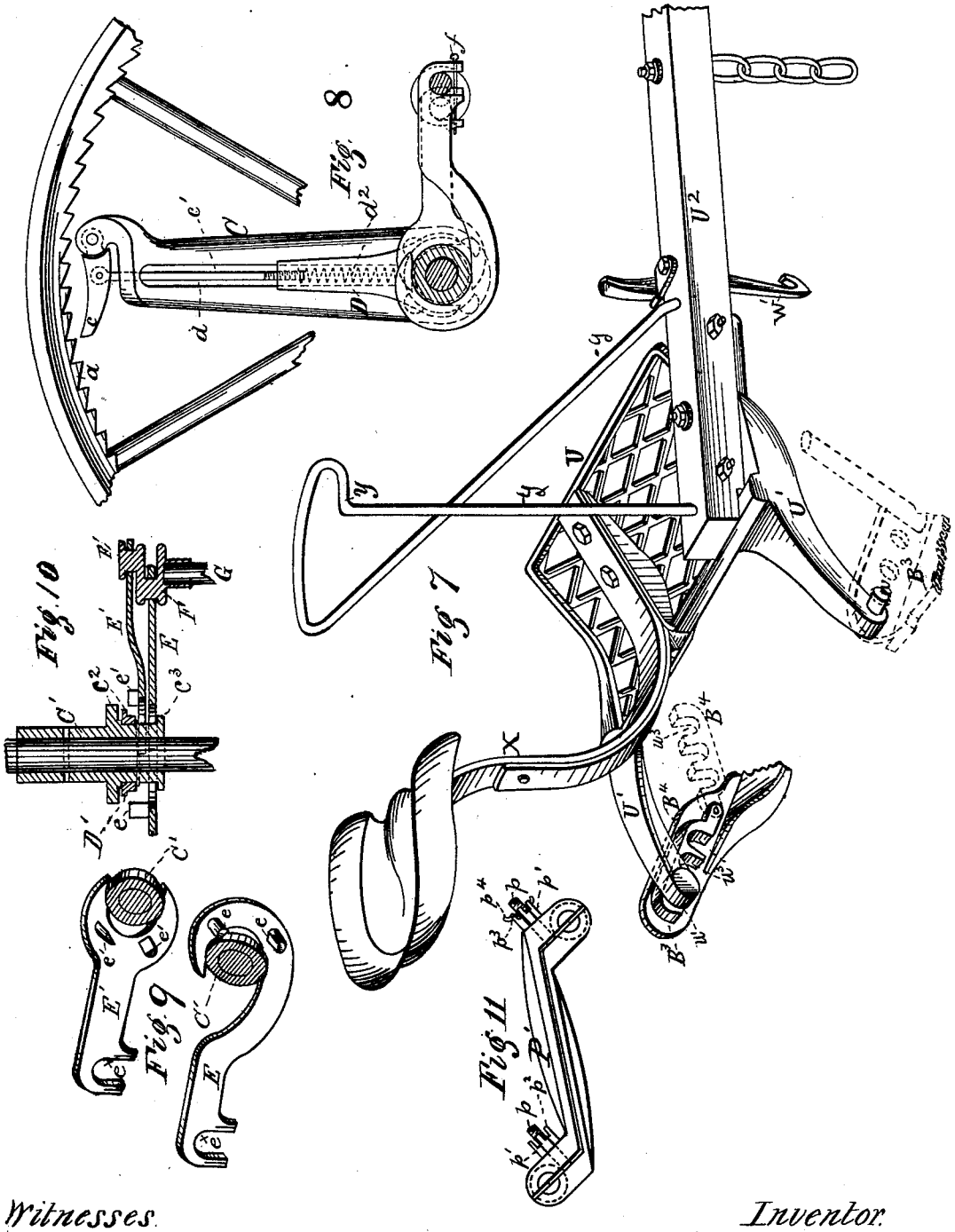

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UNITED STATES PATENT OFFICE.

WILLIAM F. GOODWIN, OF STELTON, ASSIGNOR OF ONE-HALF HIS RIGHT TO EDWARD F. ROBERTS, OF NEW BRUNSWICK, NEW JERSEY.

IMPROVEMENT IN MOWERS.

Specification forming part of Letters Patent No. **198,604**, dated December 25, 1877; application filed March 27, 1877.

To all whom it may concern:

Be it known that I, WM. FARR GOODWIN, of Stelton, in the county of Middlesex and State of New Jersey, have invented certain new and useful Improvements in Harvesters; and I do hereby declare that the following is a full, clear, and exact description thereof, which 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 letters of reference marked thereon, which form a part of this specification.

Figure 1 is a perspective view, the seat and tongue frame having been removed. Fig. 2 is a side view, partly in section, taken from the inner or cutter-bar side of the machine, the driving-wheels having been taken off. Fig. 3 is a vertical longitudinal section through the main axle, showing part of one driving-wheel. Fig. 4 is a transverse vertical section on line *x x* of Fig. 3. Fig. 5 is a vertical transverse section on line *y y*, Fig. 3. Fig. 6 is a vertical transverse section of the seat-spring on line *z z*, Fig. 2. Fig. 7 is a detached view of the tongue and seat support or frame. Fig. 8 is a side elevation of the devices for locking the driving-wheels with the main axle and disengaging the same, part of the wheel having been broken away. Fig. 9 is a detached view of part of the locking devices. Fig. 10 is a horizontal section of a portion of the main axle and part of these locking devices, and Fig. 11 shows an elevation of the pitman or link which connects the bifurcated lever with the cutter-bar. Figs. 12 and 13 show a modification of the self-adjusting bearing for the axle.

In the drawings, A A are the driving-wheels, mounted loosely upon the main axle A′, the rim of each wheel having an internal ratchet, *a*.

The main frame consists of a drooping front part, B, connected by an open or skeleton central portion with a tubular part, B^1 B^2, which is mounted upon the main axle A′. The front part is provided with an upwardly-projecting standard, *b*, which carries the leading-wheel, and also supports the front side of the finger-bar frame, as will be explained.

A second upwardly-projecting ratcheted standard, b^1, carries a lifting-lever, which tilts the cutter-bar frame or shoe. A horizontally-projecting arm, b^2, supports one end of a rock-shaft, and constitutes a track to support or partially support the sleeve of the reciprocating-screw.

Each driving-wheel is locked to the main axle by means of certain devices. (Shown more plainly in Figs. 8, 9 and 10, to which figures attention is now more especially directed.)

C is an arm, formed in one piece with a hub or short sleeve, C′, keyed to the axle A′. *c* is a pawl pivoted to the outer end of the arm C, and engaging with the teeth of ratchet *a* when not withdrawn therefrom. D d^1 is a tripping-link, having a segment, D′, at its lower end, and having its upper end attached to pawl *c*. The upper end of this link has a right-angled shank, d^1, (see Fig. 3,) which enters and travels in a slot, c^1, (see Figs. 3 and 8,) in the arm C, the part *d* being also in this slot. The lower or inner end of part *d* is screw-threaded, and screws into the shank d^1, whereby the length of the arm is made adjustable. The segment D′ projects from the arm, forming a flange. (See Fig. 3.)

E E′ (see Fig. 9) are yokes, each provided at one end with an eye or bearing, $e^\times$, adapted to clasp one wrist of a double crank, F F′, Fig. 10, there being one of these double cranks on each end of a rock-shaft, G, which is mounted in suitable bearings on the main frame of the machine.

The eyes or bearings $e^\times$ may be secured to the cranks by means of pins *f*, (see Fig. 8,) or by being slitted, as shown in Fig. 9, when the slitted parts may be clasped around the wrists of the cranks.

The inner ends of the yokes are forked or hooked, so that they shall straddle the sleeve C′, as indicated in dotted lines in Figs. 8 and 9, lateral play of the yokes upon the sleeve being prevented by the collars c^2 c^3.

Thus it will be seen that from this construction the inner end or rear end of each yoke is supported independently upon the sleeve, and that each yoke is made of a single piece of metal, and may be removed independently of the other one.

e e are dogs projecting from the face of yoke E, and *e′ e′* are similar dogs upon the face of yoke E′.

In Fig. 9 it is indicated that the dogs *e e*

occupy a position upon one side of sleeve C′, dogs e' e' being upon the opposite side of the sleeve.

Dogs e e are longer than dogs e' e', so that when the parts are in working position, as in Fig. 10, the ends of all of the dogs are in the same vertical plane with the segment D′, and when the devices are in this position—that is, with the dogs removed as far as possible from the sleeve C′—the link D d is thrust outward from the sleeve by the spring d^2, and the pawl c engages with the ratchet a, thus locking the drive-wheel to the main axle, the segment revolving freely without contact with the spread dogs.

When, however, the position of the cranks F F′ is reversed the dogs are drawn toward the sleeve C′ and made to engage with the segment D′, forcing it inward upon the sleeve and withdrawing the pawl from the ratchet, as in Fig. 3, thus permitting the drive-wheel to revolve without rotating the main axle.

The operator can move the rock-shaft and double cranks by means of the weighted lever G′. (See Fig. 1.)

As the construction and operation of the reciprocating screw represented by L L^1 K, Figs. 1 and 3, are fully explained in my Patent No. 176,402, I will not describe them in detail, except so far as may be necessary to point out the scope of my present invention.

The nut L L^1 is firmly attached to the main axle A′, and rotates with it. The helicoidal part K is provided with a sleeve, K′, which projects through the part L of the nut, and has a flange, M, rigidly secured to its end.

The part L of the nut-section is expanded horizontally near its center, and formed into a flaring oil receiver or drip, as shown at l, Fig. 3, to catch the oil which may fall from the upper part of that section, and convey it (the oil) to the lower part of the nut, as otherwise a portion of such oil would be likely to flow outwardly upon the sleeve of K′ or the helicoid K.

The part L^1 of the nut is expanded centrally into a sleeve, L^2, which serves as a bearing for one of the driving-wheels, and is provided with two ribs, l^1 l^2, which ribs serve to confine in proper working position the devices which lock that wheel to the sleeve L^2, the axle A′, and the nut.

Flange M has trunnions m m at upper and lower side, and an arm, M′, extending forward. The front end of arm M′ is curved to pass under rock-shaft G, and is provided with a recess, m^1, in which is placed an anti-friction roller or ball, m^2, (see Fig. 2,) which rests upon and traverses the track b^2 of the main frame.

N $N^\times$ is a bifurcated lever, carrying at its lower end a wrist-pin, n. This lever may be made of two comparatively thin pieces of metal.

N′ is a buffer-guard attached to the lever N $N^\times$ near its lower end, to engage with buffers, to be hereinafter described.

The lower bar, $N^\times$, of the lever is expanded at a point just in rear of the buffer-guard, and formed into a transverse plate, n^1, which projects horizontally a short distance each side of the bar, and rests upon an anti-friction ball or roller, n^2, which rolls in a seat or recess, B^3, formed for its reception in the main frame.

n^3 n^3 are socket bearings or bushings interposed between the trunnions m m and the bifurcated lever, the upper bushing having an oil-hole, as shown in Fig. 2; and should there be any wearing away of these parts, new and properly-sized bushing can be easily put in, or these bushings may be turned around to present new wearing-faces. O O^1 is a tubular standard, adjustably secured to the frame of the machine by means of bolts which pass through the frame, and through slots o in the central angular plate O^1 of the standard, one of the bolts and slots being shown in Fig. 2. O^2 is a round shaft or pivot supported in the tubular standard, which is located immediately in rear of the flange M. The projecting ends of the pivot are squared, and enter rectangular slots n^4 in the rear ends of lever N $N^\times$, the lever being further secured to the shaft by means of nuts o^1.

When desired, bearing-blocks, as shown at o^2 in my Patent No. 176,402, may be employed in these slots; but they will not ordinarily be needed, because the friction balls or rollers m^2 n^2 will support the weight of the front end of the lever and the downward thrust upon it which would otherwise result from the forward rotary motion of the nut L L^1 and the axle, and the consequent friction upon the helicoid K and sleeve K′.

From the above description it will be seen that when the pawl c is engaged with the ratchet a, as shown in Fig. 1, a forward movement of the machine produces a rotary movement of the nut-section L L^1 in the same direction as that of the driving-wheels, and will produce a reciprocating movement of the parts K K′ and flange M, and a vibratory motion of lever N $N^\times$ about the pivot O^2 as a center, which motion is imparted to the cutter-bar P through the pitman P′, and that the throw or traverse of the cutter can be increased beyond that produced under the adjustment of parts shown in the drawings by moving the pivot O^2 and its support O O^1 nearer to the flange M, thus shortening that part of the lever between its fulcrum (the pivot O^2) and its power, (the trunnions m m,) and in case bearing-blocks are used in slots n^4, a thickness equal to the advance of the pivot should be taken from the blocks in front of the pivot and placed behind the pivot.

As the lower portion of the space within the nut L L^1 can be filled with oil, these parts (the screw) will run with but little friction.

Near the lower end of lever N $N^\times$, I arrange two buffers, n^5 n^5, preferably of rubber, against each of which the guard N′ alternately strikes, thus materially assisting the screw and nut at each end of the throw of the lever.

The shank n of the wrist-pin is screw-thread-

ed, and engages with a female thread cut in the lower half of the lever N $N^{\times}$. The pin is screwed into this female thread until the shoulder p^4 bears upon the upper part N of the lever. A nut, p^5, is screwed tightly upon the lower projecting end of the pin, and serves as a jam-nut, to secure the pin firmly in place, thus dispensing with one nut.

The pitman P′ (see Fig. 11) is provided at each end with a spherical socket, to receive the round heads of the wrist-pins, and is divided longitudinally, as shown, the two parts being adjustably secured to each other by means of bolts p and nuts p^1. The annular position of the ends of the pitman relative to the central parts insures a continuous surface in the sockets to receive the stems of the wrist-pins.

Each nut has upon its upper surface a number of notches or slits, p^2, and each bolt has a hole, p^3, through it, in order that when the pitman has been properly adjusted upon the wrist-pins the nuts can be locked to the bolts by means of wires p^4, as shown.

With exceptions to be hereinafter stated, the cutter-frame S S^1 S^2, its supporting devices, its tilting-lever or finger-bar lever, and the lifting-lever V and its locking devices, and the leading-wheel R and its supports, are substantially the same in construction and operation as the corresponding parts in my Patent No. 176,402, and need not now be specifically described.

As shown in Fig. 2, the finger-bar is supported in the cutter frame or shoe at an angle to the plane of the cutter-sections and the slots in the fingers through which the cutters vibrate. It will be seen from an examination of this figure that the rear edge of the finger-bar is much lower or nearer the ground than the front edge is, the result of this construction being that the cut grass passes much more readily from the cutting apparatus than it would if this finger-bar were level; and a further, and perhaps more important, result is, that when the fingers are tilted forward or downward to cut close to the ground, or to pick up down or tangled grass, the rear edge of the finger-bar will not rise above the level of its front edge, as is customary in other machines.

I have found that in practice an upwardly-inclined position of the rear edge of the finger-bar interferes materially with a proper delivery of the cut grass, which objection is entirely overcome by my construction.

It will be seen that the upper side of the shank of the guard-finger is beveled or inclined, to correspond with the angle of inclination of the finger-bar.

The groove or recess b^4, in the upright in which the pin s slides, is provided at the lower end with a shoulder, b^5, the pin s having a lug, s', at its forward upper end, and as the guard-fingers are tilted or rocked downward the lug s' strikes the shoulder, and thereby prevents further depression of the points of the guard-finger or other displacement of parts. Thus the open-bottomed groove b^4 permits the pin s and the points of the guard-fingers to fall much lower than they could were the lower end of the groove closed, while the lug s' and shoulder b^5 prevent such parts from dropping too far.

U U^1 is the tongue and seat frame or draft-frame. U^2 is the tongue. The arms U^1 of the draft-frame, which extend rearward, are each provided with outwardly-extending lugs or pivots u u^1, which enter holes u^2, formed for their reception in brackets B^3, projecting rearward from the main frame of the machine, and by preference cast in one piece with said frame.

B^4 is a locking-latch, pivoted to one of the arms or brackets B^3, and provided upon its under side with a series of notches, u^3, corresponding, substantially, in position to the series of holes u^2 in the bracket to which it is pivoted.

The distance between the brackets is as much greater than the distance from outside to outside of the arms U^1 as will permit the latch B^4 to be shut down into the position shown in full lines in Fig. 7.

In order to remove the tongue-frame from the main frame, the latch is thrown forward, as in dotted lines, the frame moved over toward the bracket which has the latch attached far enough to permit pivot u to slip out of its seat or hole, when pivot u^1 can be removed from its seat, this pivot u^1 being much longer than pivot u is, to permit the desired movement.

By adjusting the tongue and seat frame in these holes in the brackets the weight of the driver may be made to properly counterbalance the weight of the main frame, or overcome partially the downward thrust upon the leading-wheel, as will be readily understood without further explanation.

W is a draft-rod, connecting the whiffletree with a lug, w, projecting downward from the main frame at a point nearly perpendicular to the main axle. W′ is a hook pivoted to the tongue, upon which the main frame may be suspended. X is the seat-spring. x^1 x^1, Fig. 6, are rubber or other springs, arranged between the lower part of the seat-spring and the draft-frame, in recesses formed by the lips x^2 x^2 and the central wedge-shaped rib x^3.

The object of this construction is to permit a desired freedom of lateral or sidewise motion of the driver's seat.

It will be readily understood that the elasticity of the S-shaped seat-spring allows sufficient rising and falling and forward and backward motion, even though the lower end of said spring be bolted rigidly to the tongue or draft frame; and it will also be seen that by my plan of supporting this spring upon the narrow edge of the rib x^3, in combination with the side springs x^1 x^1, the seat has a free (within certain limits) lateral rocking motion upon the edge of the rib x^3 as a center.

Y is a driver's guard, rising from the tongue or the tongue-frame, as may be most convenient, to prevent the driver from being thrown

from his seat in case the machine meets an obstruction or otherwise.

By providing my guard with long legs *y y*, I adapt it to be readily attached to the tongue or wooden frame of a harvester by merely boring holes in the wood for the reception of these legs; hence it can be more readily attached to many of the machines now in use than it could be if it were constructed to be secured to the seat itself, owing to the great difference in the form and size of such seats.

With a view to reduce the friction of the main frame upon the main axle, I have divided the rear tubular portion of said main frame horizontally into two parts, B^1 B^2, and have formed internal chambers $b^\times$ near each end of this tubular part. Within each of these chambers I place a ring, $b^{\times\times}$, and within this ring I arrange a sufficient number of anti-friction rollers, $b^{\times\times\times}$, to form a suitable bearing, commonly called a "cage," for the main axle.

In order that the rings shall be self-adjusting to their inclosing-chambers, I make the outer surface of each to represent a sphere with a sector cut from each side, the center of the sphere being the center of the axle, at a point about equidistant from both ends of the rollers.

When preferred, the cage may be dispensed with, and the rings made of such internal diameter as to fit the main axle. In either construction the rings may be cast upon chill-mandrels or bored.

It is obvious that these rings, owing to their external form, will be self-adjusting within their chambers, and that by loosening the nuts which bind the two parts of the parts B^1 B^2 together the rings may be turned around within their chambers, or the rings may be made sufficiently loose to adjust themselves (see Figs. 12 and 13) should wear of parts render this desirable.

Oil-holes may be made in these chambers, and oil will be taken up from the lower portion of the chambers and applied to the axle and ring by the rollers.

Z Z′, Figs. 3 and 5, represent, respectively, the upper and lower shells of a somewhat larger chamber formed in the tubular part of the main frame. *z* is a collar or flange firmly attached to and revolving with the main axle A′. z^1 z^1 are two followers fitting loosely upon the axle. They are oblong or rectangular in form, and are prevented from revolving with the axle by means of ribs z^2 z^2 on the inside of the chamber, with which the ends of the followers engage.

z^3 z^3 are keys or wedges, the legs of which pass down upon each side of the axle. z^4 z^4 are shoulders or abutments cast upon the inside of the chamber, preferably in an inclined position, as shown in Fig. 3.

The inner faces of the followers z^1 z^1 are flat, so as to properly engage with the collar *z*, their outer faces being preferably made curvilinear to engage properly with the keys z^3 z^3. z^5 z^5 are set-screws in the upper part of chamber Z Z′, engaging with the keys z^3 z^3. This chamber is provided with a suitable oil-hole, and the collar *z* is of such size as to insure that it shall reach down into oil retained in the lower part of the chamber, and thus lubricate the parts.

It will be readily seen that by means of the collar *z*, the followers z^1 z^1, the keys z^3 z^3, and the set-screws, the longitudinal position of the main axle A′, the flange M, and the helicoid or screw K can be accurately adjusted relative to the main frame and the nut-section L L^1, and also that any jar, concussion, or strain which may ordinarily be produced upon the main axle will be transferred to and supported by the devices contained within the chamber Z Z′.

For the purpose of securing together the two parts of which the main frame is composed, I cast bolts a^1 a^1 into the lower section, the bolts extending upwardly through the upper section, as in Fig. 4. a^2 a^2 are nuts applied to bolts a^1 a^1. The lower ends of the bolts may be screw-threaded, or have heads, or made of other shape which will insure their being held firmly by the cast metal.

The construction, operation, and function of the various parts of this machine have been so fully set forth and described herein, when taken in connection with my Patent No. 176,402, that no more detailed description need be given, as I believe that these matters will be fully understood by all who are familiar with the general construction and operation of mowing-machines.

Having thus set forth the nature of my invention, what I claim is—

1. The combination, with the bifurcated lever N $N^\times$ and trunnions *m m*, of the bushings n^3 n^3, substantially as set forth.

2. In a harvester, the combination, with the lever N $N^\times$ and main frame, of a friction-roller to support the front vibrating end of the lever upon the main frame, substantially as set forth.

3. In a harvester, the combination of the flange M, provided with the arm M′, the track b^2, and a friction-roller to support the flange against rotary thrust, substantially as set forth.

4. The pivot-pins provided with the lug *s*′, in combination with the slot b^4, having the shoulder b^5 at the lower end, substantially as set forth.

5. The combination of the main axle, the main frame adjustable longitudinally thereon, and carrying the fixed lever-pivot, with the vibrating lever, substantially as set forth.

6. In a harvester, the tubular part B^1 B^2 of the frame, provided with the chamber $b^\times$, in combination with the globular ring $b^{\times\times}$, rollers $b^{\times\times\times}$, and bolts or set-screws, securing the two parts of the chamber together upon the globular ring, substantially as set forth.

7. In a harvester, the main axle A′, having a collar rigidly attached thereto between the driving-wheels, in combination with the main frame, provided with abutments or shoulders

upon opposite sides of said collar, whereby the desired longitudinal position of the main frame relative to the axle may be maintained, substantially as set forth.

8. The main frame provided with a chamber, Z Z′, having abutments z^4 z^4, in combination with the axle A′, collar z, followers z^1 z^1, keys z^3 z^3, and set-screws z^5 z^5, substantially as set forth.

9. In a harvester, the tubular part B^1 B^2 of the frame, provided with the chamber $b^\times$, adapted to receive the cage of anti-friction rollers and to contain oil, in combination with the ring $b^{\times\times}$ and rollers $b^{\times\times\times}$, substantially as set forth.

10. The part L of the nut-section, provided with the expanded flaring part to collect and return the oil, substantially as set forth.

11. The combination, with the main axle, of the sleeve L^2, provided with the ribs l^1 l^2, and the part L^1 of the nut-section, whereby said sleeve is made to support the one end of the axle upon a driving-wheel, to support the locking devices, and to support and drive the nut-section, substantially as set forth.

12. The yoke E, made in one piece, in the form of a hook, to extend in rear of the axle and rest upon the sleeve C, in combination with the forked yoke E′, for actuating the segment D′, and adapted to be removed from the sleeve C without taking off the driving-wheel, substantially as set forth.

13. The draft-frame provided with the central rib x^3 and the lips or ribs x^2 x^2, one upon each side of rib x^3, and of less height, in combination with the seat-spring x and spring x^1 x^1, arranged in recesses formed by ribs x^2 x^3, to permit a rocking lateral motion of the seat, substantially as set forth.

14. The combination of a locking-latch with the arm U^1 and bracket B^3, substantially as set forth.

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

WM. FARR GOODWIN.

Witnesses:
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H. H. DOUBLEDAY.