

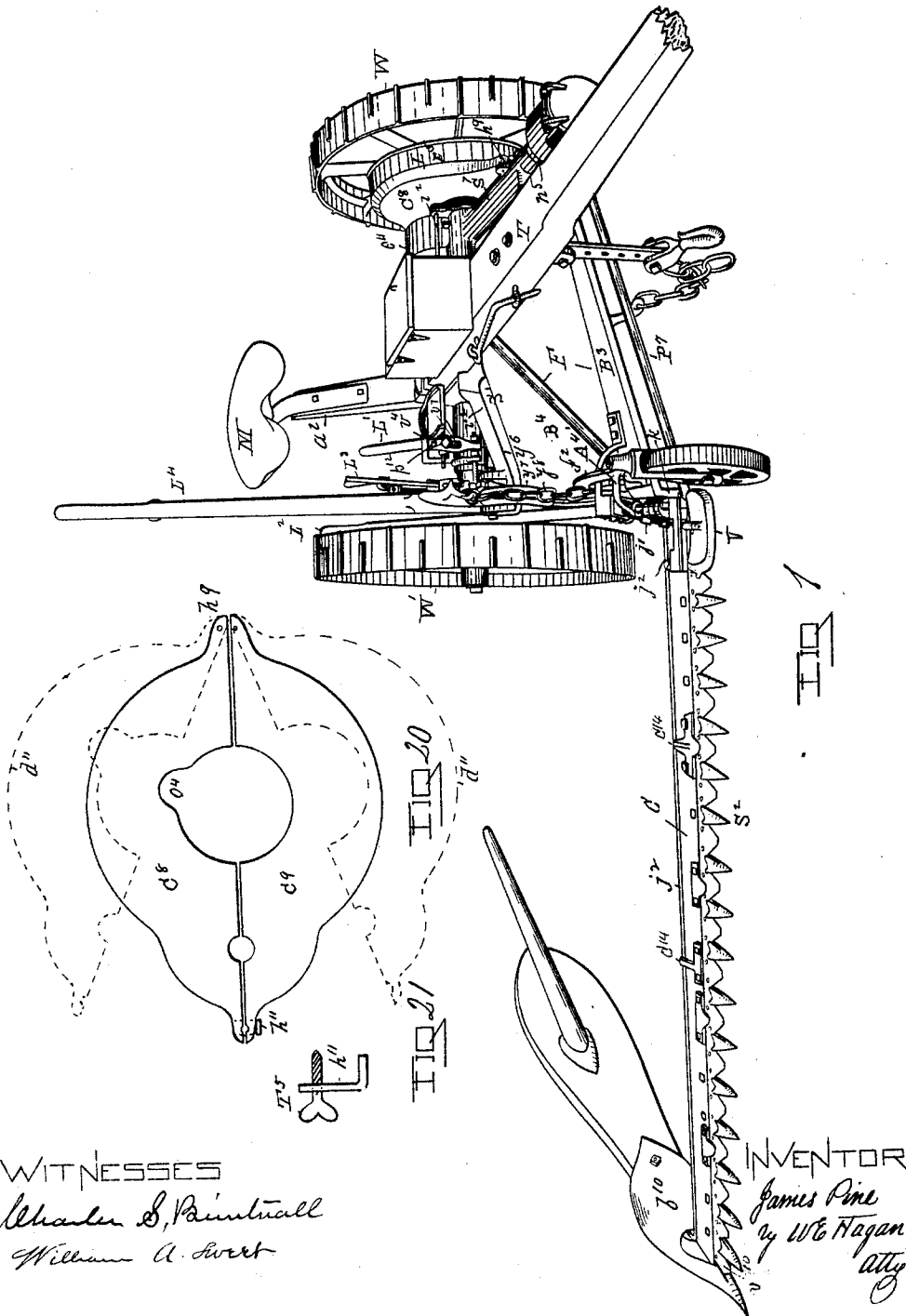
(No Model.)

8 Sheets—Sheet 1.

J. PINE.
MOWING MACHINE.

No. 586,621.

Patented July 20, 1897.



WITNESSES

Charles S. Brintnall
William A. Sweet

INVENTOR
James Pine
By W. E. Hagan,
Atty.

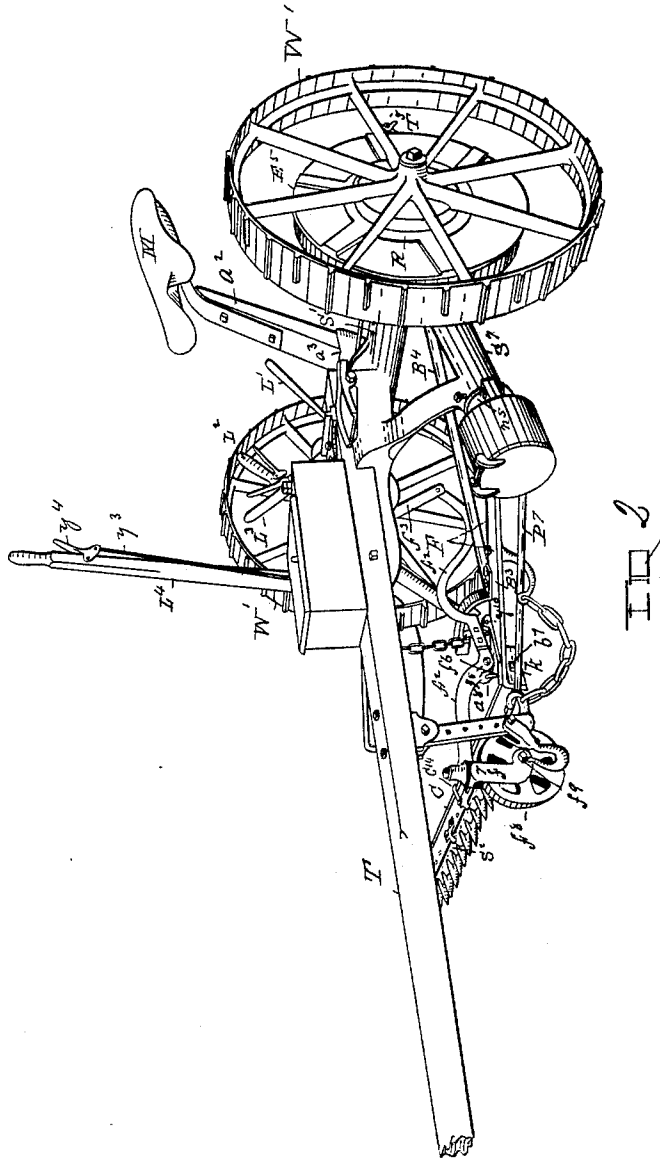
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8 Sheets—Sheet 2.

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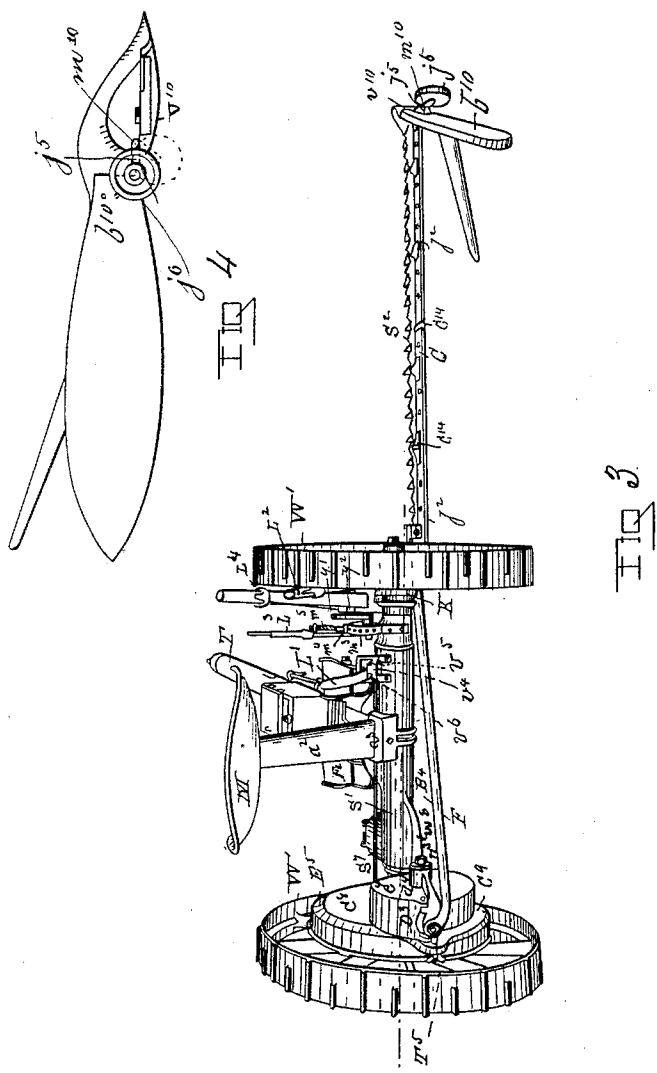
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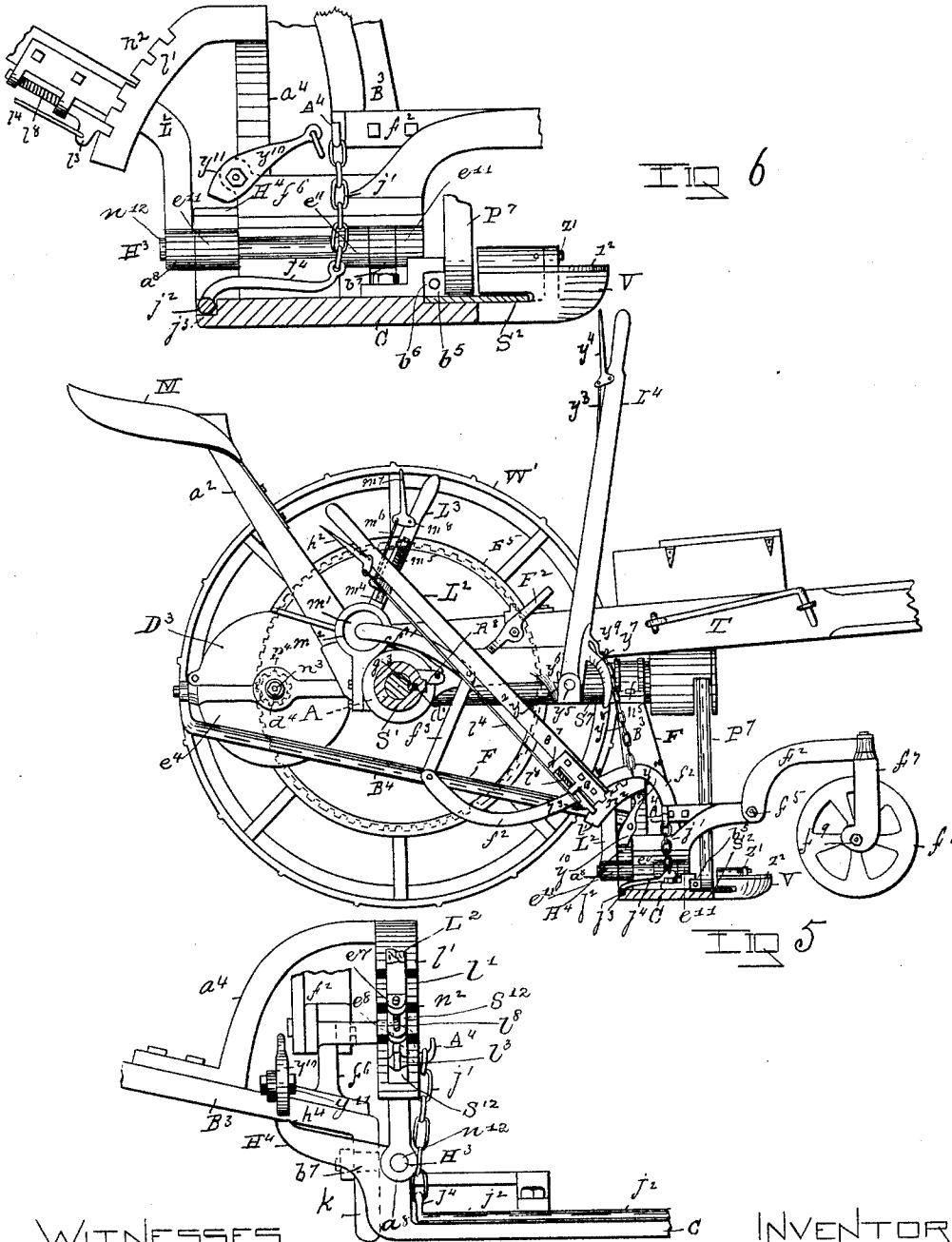
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8 Sheets—Sheet 4.

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FIG 7

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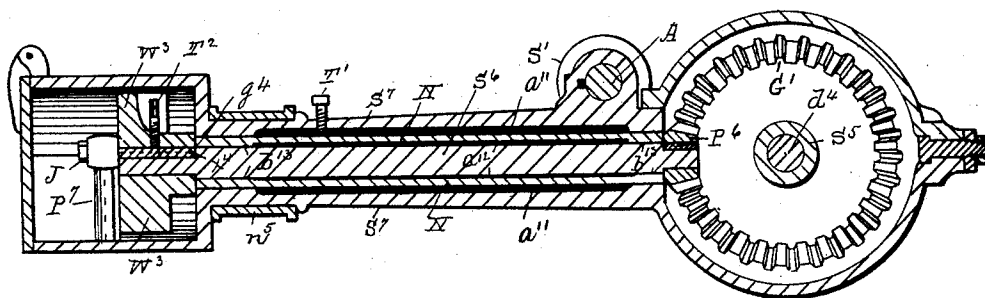
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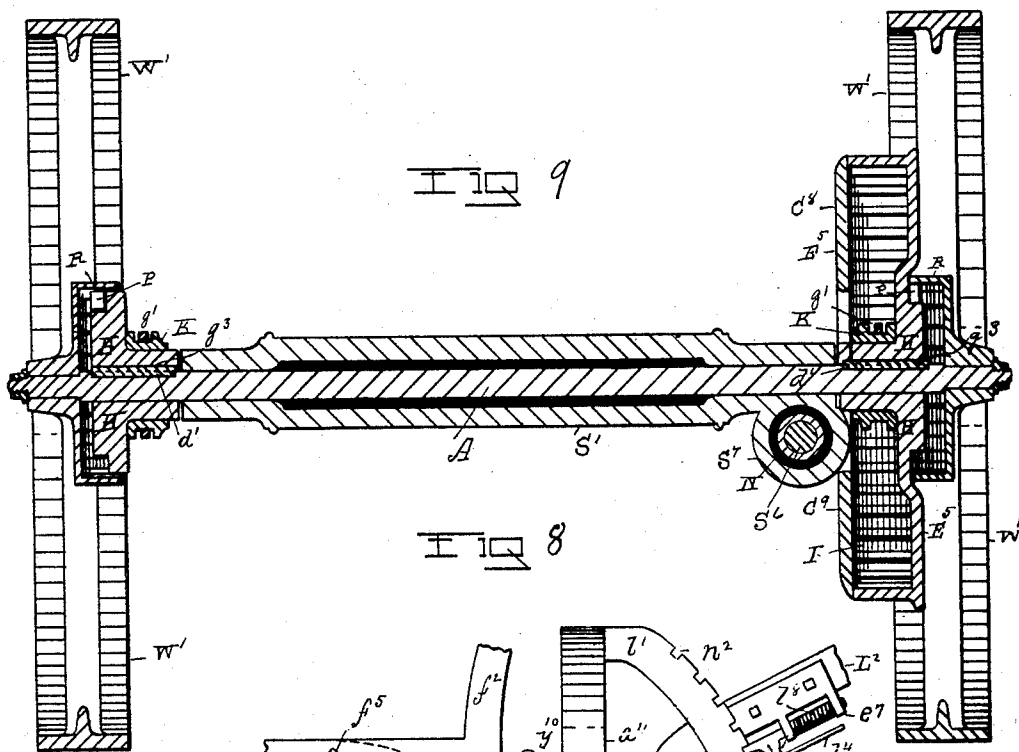
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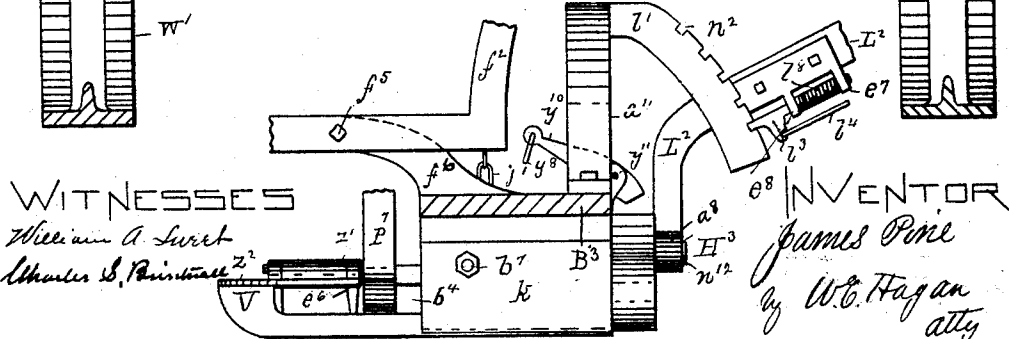
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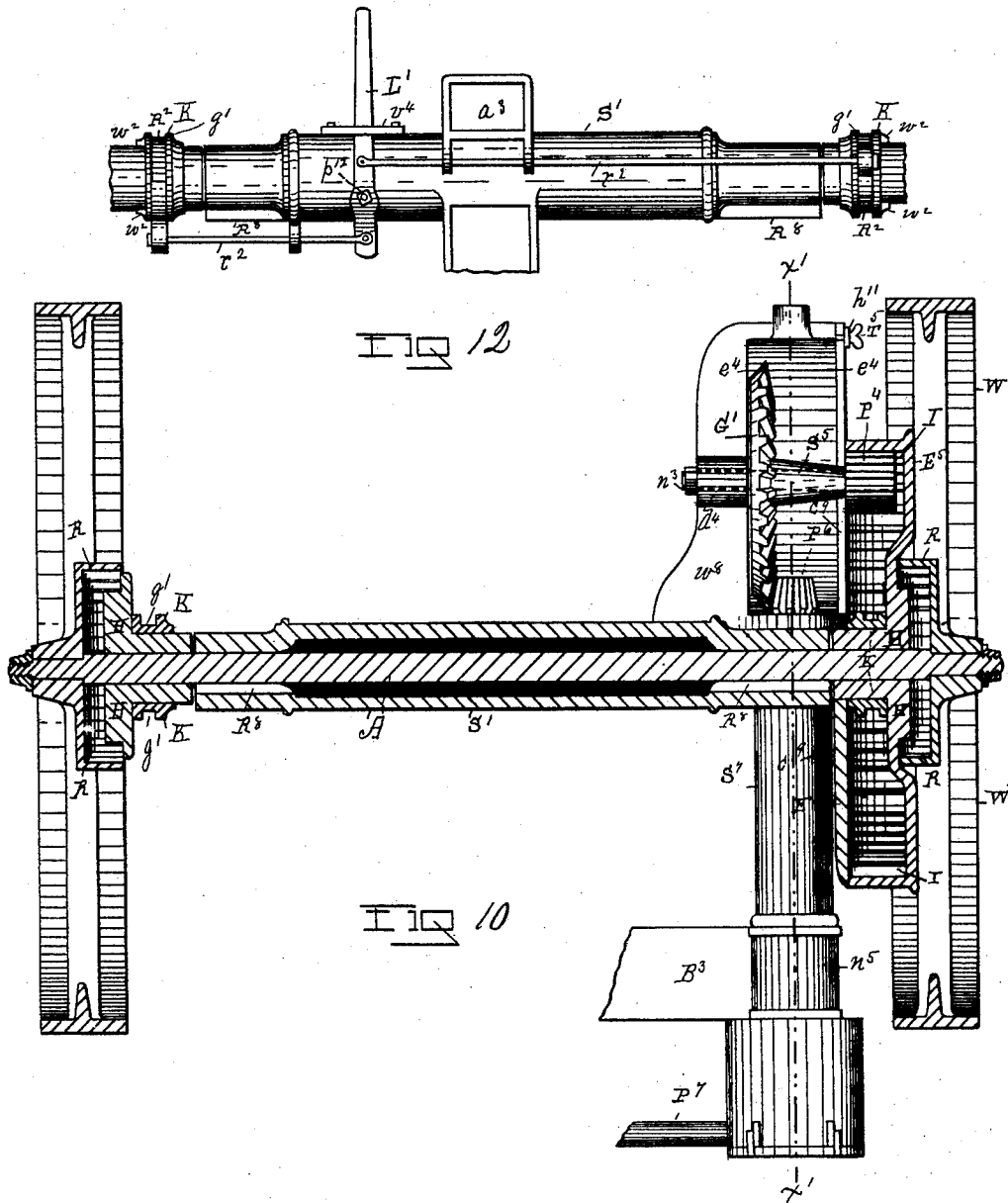
(No Model.)

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J. PINE.
MOWING MACHINE.

No. 586,621.

Patented July 20, 1897.



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(No Model.)

8 Sheets—Sheet 8.

J. PINE.
MOWING MACHINE.

No. 586,621.

Patented July 20, 1897.

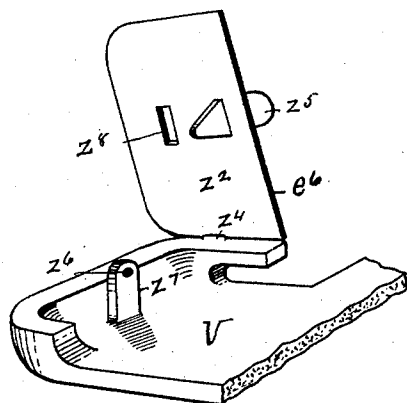


FIG 22

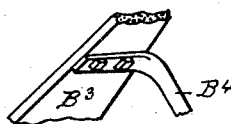


FIG 26

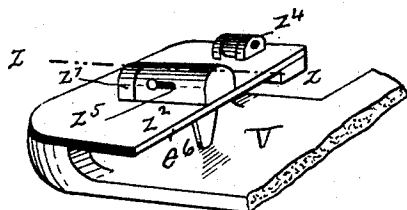


FIG 23

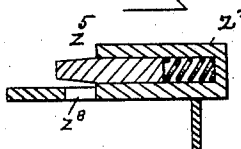


FIG 24

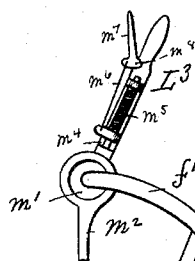


FIG 25

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UNITED STATES PATENT OFFICE.

JAMES PINE, OF LANSINGBURG, NEW YORK.

MOWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 586,621, dated July 20, 1897.

Application filed April 21, 1890. Serial No. 348,903. (No model.)

To all whom it may concern:

Be it known that I, JAMES PINE, of the village of Lansingburg, county of Rensselaer, and State of New York, have invented new and useful Improvements in Mowing-Machines, of which the following is a specification.

Accompanying this specification, to form a part of it, there are eight plates of drawings, containing twenty-six figures illustrating my invention, with the same designation of parts by letter reference used in all of them.

Of the illustrations, Figure 1 is a front view perspective of a mowing-machine containing my improvements with the outer end of the tongue shown as broken off. Fig. 2 is another perspective of the same machine with the front and one side thereof facing the view, with the outer end of the tongue shown as broken off. Fig. 3 is a rear elevation of the same machine. Fig. 4 is a side elevation of the swath-board and its tracking-wheel. Fig. 5 is a side elevation of the improved mowing-machine illustrated in the other figures, but shown with one of the main wheels removed and the cutter-bar, sickle, and main axle shown in section. Fig. 6 is an enlarged side elevation of the shoe and connected parts illustrated in the same position as shown at Fig. 5. Fig. 7 is a rear view of the parts shown at Fig. 6. Fig. 8 is an elevation of the parts shown at Fig. 7, taken so as to bring what is their inside face when in position at the front in this illustration. Fig. 9 is a vertical section taken through the wheels, axle-sleeve, axle, interior gear, ratchets, pawl-holders, pawl-shippers, pitman-driving shaft, and inclosure containing the latter. Fig. 10 is a horizontal section of the parts shown in vertical section at Fig. 9, with the cover inclosing the gears operating the pitman crank-shaft removed and with the inclosure containing the interior gear and connected pawl-holder illustrated in section and showing in a top view the pinion receiving power from the interior gear, also the beveled gear on the said pinion-shaft operating a beveled pinion-gear on the pitman crank-shaft, together with a top view of the inclosure containing the pitman crank-shaft. Fig. 11 is a section taken on the line $x'x'$ of Fig. 10. Fig. 12 is a top view of the axle-sleeve and the le-

ver operating the pawls, also showing a part of the tongue-seat and a part of the support on which the driver's seat rests. Fig. 13 shows a perspective of one of the ratchets, there being one connected with each wheel oppositely facing each other and made alike in construction. Fig. 14 is a perspective of one of the pawl-holders, of which there is one at each end of the axle facing oppositely and made alike, excepting that the pawl-holder adjacent to the interior gear is made integrally with the latter. Fig. 15 is a view of the inner faces of the pawl-holders. Fig. 16 is a perspective of one of the pawl-shippers, of which there is one for each of the pawl-holders, made to encircle the hub of the pawl-holder at one end of the axle and to encircle the hub of the pawl-holder and combined interior gear at the other end. Fig. 17 is a top view of the driver's foot-rest and a part of the tongue, with which it connects adjustably. Fig. 18 is a side elevation of the parts shown at Fig. 17, with a dotted line indicating the foot-rest as turned up at the front. Fig. 19 is a perspective of a part of the sickle, the sickle-eye, and the swivel with which the sickle-eye block connects with the sickle. Fig. 20 is an elevation of the inclosure containing the gear-wheels operating the pitman crank-shaft, illustrated with that side of the inclosure facing the driver's seat shown as turned to the front in the figure. Fig. 21 shows the fastening for the cover of the inclosure. Fig. 22 is a perspective of a part of the shoe with the hinged latch-cover shown as turned up on its hinged connection. Fig. 23 is a view of the same parts shown at Fig. 22 with the shoe-cover down and as latched. Fig. 24 is a section taken on the line $z z$ of Fig. 23. Fig. 25 is a detached view of the lever, handle, the link, and a connected pivoted lever by which the parts resting on the tracking-wheel and ground-wheel in front of the shoe are raised or depressed. Fig. 26 is a perspective of the connection made by the outer end of the brace-rod with the coupler-bar.

The several parts of the mowing-machine thus illustrated are designated by letter reference and the function of the parts is described as follows:

The letters W designate the wheels; A , the

axle; S', the axle-sleeve; T, the tongue; F, the under or tilting frame; C, the finger-bar; S², the sickle.

The letters R designate the ratchets, of which there is one arranged on the inner face of each of the propelling-wheels. Each of these ratchets is an interior ratchet and arranged on the inner edge face of an inclosure, as shown at Fig. 13, and they are arranged to face each other as placed on the propelling-wheels.

The letters H designate pawl-holders, and P pawls, each of which is arranged on a pivot-shaft p' so as to turn in the circular recess r' , made in the pawl-holder plate p^2 , as shown at Figs. 14 and 15.

The letters S³ designate a spring arranged in the opposite side faces of the pawl-holder plate beneath each of the pawls, and which springs operate to force outwardly the pawls P, so that they will engage with the ratchet-teeth when not operated by the pawl-shipper.

The letters a designate an arm arranged on the inner end of each of the pawl pivot-shafts, which arms a are operated to press inwardly the outer ends of the pawls proper as the arms a are moved outwardly, and so that the pawls will not, when thus acted upon by the arms, engage with the teeth of the ratchets.

The letters K designate shippers which are arranged at each end of the main shaft so as to move on the hub of the pawl-holder at one end of the axle and the hub of the pawl-holder and combined interior gear at the other end of the axle.

The letters w^2 designate wedges projected from the face of the shipper K which is adjacent to one of the pawl-holders, and o' passages made in the adjacent pawl-holder in line transversely with said wedges on the shipper, so that when the latter are moved outwardly at each end of the axle the said wedges will enter the passages o' and by their engagement with the arms a force outwardly the latter and inwardly the pawls proper, away from their engagement with the ratchets.

The letter R² designates a ring encircling the shipper K within the groove g' , and this shipper at each of the opposite ends of the axle is operated by a shipping-lever L', which is pivoted at p^{12} and connected with the rings R² by oppositely-placed rods r^2 r^2 , as shown at Fig. 16. When the lever L' is pulled toward the driver's seat, then the shippers are moved outwardly and the wedges on the shipper-face engage with the pawl-arms a to disengage the pawls from the ratchets, and when lever L' is moved away from the driver's seat on its handle end then the shippers K are moved inwardly away from their engagement with the pawl-arms a and the pawls proper, by the action of the springs S³, are caused to engage with the ratchets.

The letter v^4 designates a frame that is upwardly projected from the axle-sleeve, as shown at Figs. 1, 3, and 12. This frame is made with two notches v^5 and v^6 , and the let-

ter v^7 designates a spring encircling the pivot-bolt p^{12} , as shown at Fig. 1. The lever L' is passed upwardly and rearwardly through the frame v^4 and as operated by the spring v^7 will be forced into the notch v^5 when the pawls and ratchets are in engagement and into the notch v^6 when the shipper has been operated to disengage the pawls from the ratchets, and in either of which positions the lever L' is held in place thereby.

The letter I designates an interior gear that is cast integrally with the adjacent pawl-holder H, and the letter d' designates a spline secured to the axle and arranged to mesh into a groove g^3 , made in the combined gear-wheel I and the combined pawl-holder, that are made integrally. The other pawl-holder H, at the end of the axle opposite to that made in connection with the gear I, is also made with a groove g^3 , and that part of the axle A adjacent thereto is also made with a spline d' , adapted to mesh into the groove g^3 thereat.

The letter P⁴ designates a pinion arranged on the tube-form shaft S⁵, said pinion meshing into the gear I, so as to receive power therefrom at the rear of its circumferential interior, and the said shaft S⁵ is arranged to turn on a stud or bar d^4 , secured exteriorly to the web w^8 by a nut n^3 , as shown at Figs. 10 and 11.

The letter G' designates a beveled gear arranged on the inner end of the shaft S⁵ and that end which is opposite to that on which the pinion p^4 is placed.

The letter P⁶ designates a beveled pinion arranged on the pitman crank-shaft S⁶, as shown at Fig. 11, said pinion meshing into and receiving power from the beveled gear-wheel G'.

The letter N designates a tube arranged within the crank-shaft sleeve S⁷, in which tube the pitman crank-shaft S⁶ turns, the latter having end journals which turn in bearings b^{13} at the ends of said tube.

The letters a^{11} designate an encircling recess made in the interior of the crank-shaft sleeve between its ends, and the letters a^{12} designate an encircling recess made in the tubular bearing N between its end bearings for the pitman crank-shaft S⁶. This tube-form bearing N is kept from turning with the pitman crank-shaft by means of a set-screw T', that is tapped into the crank-shaft sleeve, so as that when screwed in it will engage with the tubular bearing N to hold the same in place. This tube-form bearing N, constructed with end bearings, differs from a tube-form bearing in which the whole length of the tube acts as a bearing and in which the least spring or vibration of the shaft renders the bearing inoperative. As I make and arrange it the parts are easily disconnected when it is desired to take the machine apart.

The letter J designates the wrist or crank pin arranged on the outer face of the crank disk-wheel W³, which latter is on the outer end of the pitman crank-shaft S⁶, said disk-

wheel being secured to the outer end of the latter by means of a feather or spline x^4 , made in said disk-wheel.

The letter T^2 designates a set-screw arranged to pass through the hub of the disk-wheel and to engage with said spline to keep the crank disk-wheel in place, preventing said wheel from slipping along said spline.

The letter P^7 designates the pitman, which makes a crank engagement with the outer face of the crank disk-wheel W^3 by means of the wrist-pin J , as shown at Fig. 11.

The letter e' designates the sickle-eye into which the inturn end of the pitman is entered for connection. The sickle-eye e' is formed in the front side of a block b^4 , that is pivoted to the outer end of a block b^5 by means of a swivel b^6 , said block b^5 being connected to the sickle at the top thereof, as is shown at Fig. 19. The angular end of the pitman is entered into the eye e' of the block b^5 and is held therein for operating the sickle by means of the edge e^6 of the shoe-cover z^2 , the latter being hinged to the shoe at z^4 and with the cover of the shoe when closed arranged by its adjacent edge to keep the pitman in place, and with the shoe-cover kept closed by an eyebolt z^7 on the shoe and a spring-bolt z^5 , arranged to pass through the eye z^6 of said eyebolt z^7 , the latter passing up through the shoe cover when turned down through an opening z^8 , as shown at Figs. 22 and 23.

The letter M designates the driver's seat, made with the supporting-bar a^2 , secured in a socket a^3 , the latter being cast integrally with the main-axle sleeve A . The under or tilting frame F is composed of the coupling-bar B^3 and brace B^4 . Bar B^3 is strapped onto the pitman-driving-shaft sleeve S^7 at v^5 at its outer end, so as to make a hinged connection therewith and therefrom extended downwardly and laterally on an incline. This bar B^3 , thus arranged, is combined with the brace-rod B^4 , which is secured to the downwardly-extended end of the coupler-bar, as shown at Fig. 26, and at its rear end is pivotally connected with the rear end of the web w^8 , as shown at Fig. 3.

The letter k designates a knee formed on the lower end of the coupler-bar B^3 , to which, by means of a pivot-bolt b^7 , the shoe V is pivoted, so as to have the front end of the latter and connected sickle and sickle-bar raised or depressed and by which the pitch of the shoe and cutting mechanism relatively to the elevation of the machine-tongue is regulated, as will be more fully detailed hereinafter.

The letter L^2 designates a lever that at its upper end is made with a handle, and at its lower end this lever is constructed with an eye a^8 , and which eye is inserted on over the head of the hinging-rod H^3 . This lever L^2 is constructed with a latch-bolt l^3 , adapted to engage with notches n^2 , formed in the outer face of the segment l' . This latch-bolt is provided with a rod l^4 , that is pivoted to said bolt and also to a handle h^2 , which latter is

pivoted to the handle end of the lever L^2 , so that when the handle h^2 and handle of said lever are grasped and brought together the latch-bolt is raised from out of that one of the notches n^2 of the segment l' in which it is engaged against the force of a spiral spring l^8 , encircling said latch-bolt between the ears e^7 e^8 on the lever L^2 , as shown at Fig. 7. The segment l' is connected to the hinged coupling-bar B^3 of the frame F by means of an arm a^4 , as shown at Figs. 6 and 7, and the lever L^2 is continued down through a slot S^{12} , made in said segment and connected to the rear end of the hinging-rod H^3 by means of the eye a^8 , formed on the lever end and in which eye the hinging-bolt H^3 is adapted to turn. The letter n^{12} designates a nut on the said hinging-rod H^3 outside of the lower end of the lever L^2 . This hinging-rod H^3 is arranged in hinging-ears e^{11} e^{11} , having passages therein for the rod, and these ears are upwardly projected from the top of the shoe V . Between where passing through the ears e^{11} this hinging-rod H^3 also passes through an eye made in the bolt b^7 , so that as thus constructed the shoe can be turned so as to raise or depress its front end on the bolt b^7 , passing loosely through the knee k , made in the end of the bar B^3 and held therein by the nut n^{13} , as shown at Fig. 8, and the shoe V can be turned up on the hinging-rod H^3 , so as to raise the sickle and finger-bar by means of the hinged connection that the shoe V makes with the said rod. With the lever L^2 thus constructed and connected when the handles of the latter are grasped to unlatch the bolt and the upper end of said lever L^2 is drawn rearwardly the front end of the shoe, the front edge of the sickle, and sickle-bar are raised, and when the position of said lever is reversed the same parts are depressed at the front, with the lever adapted to be held in any measure of such adjustment by the latch-bolt. As thus made and arranged the pitch of the sickle when cutting may be adapted to the height or standing of the team which is to draw the machine and the measure of elevation their stand height gives to the elevation of the tongue of the machine.

The letter L^3 designates a latch-lever that makes a connection with a shaft m' , passing through a supporting-bearing m^2 , that is projected upwardly from the main-axle sleeve, said support on its rear being constructed with a segment having therein latch-bolt recesses m^3 , as shown at Figs. 3 and 5. This lever L^3 is provided with a latch-bolt m^4 , arranged on its side, so as to be over the recesses or notches in the segment face of the support m^2 . This latch-bolt is provided with an encircling spring m^5 , against the force of which it is raised from out of the recesses, and it is connected to a rod m^6 with the latch-handle m^7 , that at m^8 is pivoted to the handle end of the lever L^3 , so that when the latter and the latch-bolt are grasped by the hand the bolt is raised from out that one of the re-

cesses which is beneath it. When the grasp is released, it descends into the recesses beneath it.

The letter f' designates a crank-arm that is arranged upon and secured to the shaft m' , on that end of the latter where passing through its bearing-support m^2 , which is opposite to that end of said shaft to which the lever L^3 connects with it. This crank-arm is at its outer end pivotally connected to a link-bar f^3 , which latter makes a pivotal connection to the rear end of the bar f^2 , which latter from where thus connecting with the link-bar is curved to extend frontwardly and horizontally to be pivoted at f^5 to the bar f^6 at the upper end thereof, the latter bar being connected to and upwardly projected from the coupler-bar B^3 , as shown at Figs. 5 and 24. The curved bar f^2 where extended frontwardly and at its outer end at the front is constructed with a downwardly-projected and forked stud f^7 , in which the ground-wheel f^8 turns on a pintle-shaft f^9 .

The letter A^4 designates an arm projected at right angles from the curved bar f^2 , back of its pivot f^5 , as shown at Figs. 1, 5, and 7, and j' a chain connected with the outer end of said arm A^4 .

The letter j^2 designates a rod or shaft that is arranged to turn within a recess j^3 in the rear and top of the shoe V , and therefrom extended outwardly to journal in clips c^{14} thereon and to also journal in the swath-board shoe v^{10} at m^{10} .

The letter b^{10} designates a swath-board, and the letter j^4 designates a crank on the inner end of said rod or shaft j^2 , with which at its upper end the chain j' connects.

The letter j^5 designates a crank on the outer end of said rod or shaft j^2 where passing beyond the end of the cutter or finger bar, said crank being arranged to journal in the swath-board shoe v^{10} , and the letter j^6 designates a tracking-wheel arranged to journal on said crank j^5 where outside the swath-board. As thus made the lever L^3 , by means of its connection with the crank-arm f' and the connection the latter makes with the shaft m' , the link-bar f^3 , and the pivoted bar f^2 , having the ground-wheel stud on its outer end, together with the connection the chain j' makes with the crank j^4 on the inner end of the rod or shaft j^2 , the cutter mechanism including the shoe V , to which it is connected, may be raised by the ground-wheel and tracking-wheel of the swath-board acting as fulcrums, when the shoe and cutter mechanism are raised by said lever L^2 , and by which the measure of stubble length cut by the sickle may be regulated to suit the condition of the ground over which the machine is passing.

The letter L^4 designates another lever which is pivoted at y^5 to an arm y^6 , which latter is projected from the side of the tongue-support, as shown at Figs. 1 and 5.

The letter y^2 designates a segment made

with recesses, which is in part shown at Fig. 5 and in a rear view at Fig. 3.

The letter y' designates a latch-bolt adapted to engage with the recesses in said segment y^2 . This latch-bolt is shown at Fig. 3 and as pivoted at its upper end to a link at y^3 , said turn-lever being pivoted to the lever L^4 near its grasping end and having a latch-bolt handle y^4 , which is adapted to be grasped in connection with the handle to raise the said latch-bolt from out of the recesses shown in the segment y^2 . The lower end of this lever L^4 is made with a curved arm y^7 , having a segmental face that is grooved out to receive a chain y^8 , that is hooked onto said arm at y^9 , as shown at Fig. 5.

The letter y^{10} designates a pivoted latch that at y^{11} pivotally connects with an ear formed on the bar f^6 , as shown at Figs. 6 and 8, and this latch being also shown at Fig. 2. The upper end of this latch y^{10} is connected with the lower end of the chain y^8 , as shown at Figs. 2 and 5.

The letter H^4 designates a horn-form projection arranged on the inner side and rear end of the shoe V , as shown at Fig. 7. The top of this horn-form projection is made flat, as indicated at h^4 of Fig. 7. The function of this lever L^4 is to raise up from off the ground bodily the shoe V , the cutting mechanism, and its operation in so doing is as follows: When the lever L^4 is moved rearwardly on its pivot the chain causes the latch y^{10} to engage with the top of the horn-form projection, and as the operation of the lever continues the whole cutting mechanism and shoe are raised up in a horizontal position, the horn-form projection keeping the parts so raised in a line parallel with the ground and without being on an incline from the machine downwardly and outwardly, with the tilting frame, to which the parts connect, turning on its hinged connection made with the main-axle sleeve. This function of the lever L^4 and its connections enables the operator of the machine to raise up the cutting mechanism when compelled to pass over cut grass, or such other purposes as such a position of the parts is rendered desirable.

The letters F^2 F^2 designate the foot rests or supports, each of which is provided with a tubular bearing q , and the letter q^3 a plate provided with trunnions on which the foot-rests, by means of their bearings, turn, and each of these foot-rests are held in place on the trunnions by a nut q^4 . This plate q^3 is made with the bolt-passages q^6 , through which a bolt secured to the top of the tongue may be passed, and this bolt is designated by the letter q^7 , and the function of this bolt on the tongue and plate q^3 , made with the holes q^6 , is to adjust the foot-rests to the length of the driver's legs and so that the seat may be conveniently used by a tall or short operator.

The letter R^8 designates recesses cast in the axle-sleeve at each end thereof for the passage of the splines upon the axle when the

latter is being drawn out of the sleeve on taking the machine apart. These recesses are shown at Figs. 10 and 12.

The letter E^5 designates an inclosure formed by the interior edge and one side of the interior gear-wheel I and the vertically-arranged side covers C^8 C^9 . These latter are pivoted at their front ends to the main frame extension, on which connections they may swing up or down edgewise, and they are each upon their inner contact-edges recessed for the passage of the interior gear-hub and shipper-rod at O^4 and also for the passage of the tubular shaft, on which is arranged the pinion operated by the interior gear.

The letter h^{11} designates an L-form support for the rear ends of these side cover parts and this support is attached to the rear end of the web w^8 . This support is constructed with a screw T^5 , made to screw into the vertical side of said support, so that the pointed end of the cover part C^9 , resting on the horizontal part of the support beneath the screw-bolt, and the side cover part C^8 is adapted at its pointed adjacent end to rest on top of said screw-bolt after it has been screwed in, as shown at Fig. 21. These side cover parts prevent the entrance of grass and other substances into the area of the interior gear and the pinion that it operates to interfere with their work. The connection of these vertically-arranged side cover parts to the machine is shown at Fig. 3, and the said cover parts are shown as detached at Fig. 20 with the rear end support for the cover parts shown as detached from the machine at Fig. 21.

The letter e^4 designates the inclosure containing the beveled gear-wheel G' , arranged on the same shaft as the pinion P^4 , and which beveled gear-wheel where within said inclosure communicates power to the beveled pinion P^6 , and the web w^3 connects this inclosure to and with the axle-sleeve made integrally with said inclosure and web. This inclosure is provided with a top cover D^3 , and upon its side next adjacent to the interior gear-wheel I this inclosure where extending beyond the latter is closed by the vertical cover parts C^8 and C^9 , as shown at Figs. 3 and 10.

The operation of the machine is as follows: When the machine is started, the propelling-wheels turn with the axle, and when the pawl-shipper K, by means of the lever L' , is operated to move inwardly, so as to release the arms which hold the pawls away from their engagement with the ratchets, the pawls are actuated to engage with the ratchets by the springs S^3 , which will cause the main axle to turn with the propelling-wheels and that one of the pawl-holders cast integrally with the interior gear I actuates the latter and the pinion P^4 of the shaft S^5 , also the beveled gear G' , which latter meshes into the beveled pinion P^6 on the rear end of the pitman crank-shaft to operate the latter, and the crank disk-wheel on said shaft S^6 and the pitman P^7 to operate the sickle in the manner before

described. When in operating the machine it becomes necessary to change the pitch of the cutting mechanism relatively to the ground over which the machine is passing, which is caused to vary by the standing height of the team and the elevation which the latter gives to the tongue, the lever L^2 is operated to raise or depress the front end of the shoe and connected sickle to meet these varying conditions of use. When it is desired to raise up the shoe and the cutting mechanism or to lower the latter to adapt it to the character of the ground over which the machine is passing to regulate the length of stubble cut, the lever L^3 is used in the manner before described. When it is desirable to raise up bodily the shoe and cutting mechanism from off the ground, then the lever L^4 is used, as before described.

I am aware that the shoe of a mowing-machine with which the cutting mechanism is connected has been constructed with a heel part that was extended laterally from the shoe, and that a pivoted lever arranged parallel to the coupler-bar was operated by a lever arranged on the latter to raise up the outer end of the sickle and finger-bar with the shoe with which they connect resting on the ground.

I am also aware that an interior gear has been used in connection with a mowing-machine driving-wheel, and which gear operating a shaft having thereon a beveled gear-wheel that meshed into a beveled pinion on the pitman crank-shaft to actuate the latter, with the geared connection and inclosure so located and arranged in front of the main axle, and which as thus placed threw all the weight of these parts upon the tongue.

I am aware of the Letters Patent to Matthew Garvin and William J. Clokey, in which the finger-bar is bolted to a shoe, which latter is journaled to a shank on the end of a lever with the end of the shank passing through the eye of an eyebolt arranged to journal in a push-bar. This construction differs from mine in the fact that in the device shown herein the finger-bar is hinged to the shoe by means of ears upwardly projected therefrom by means of a hinging-rod, the latter passing through said ears and the eye of an immediately-placed eyebolt and the latter pivoting in the downturned knee end of the coupler-bar.

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

1. The combination with the lever L^3 , attached at its lower end to a shaft having a bearing in which to turn, of a crank connected to said shaft; a link connecting with said crank; a bar f^2 , pivoted to said link and extended frontwardly to connect pivotally with the ground-wheel stud, and intermediately pivoted to a bar f^6 , that is upwardly projected from the coupler-bar; a shaft or rod adapted to turn in a recess in the rear of the shoe and

finger-bar, said shaft or rod at its outer end provided with a crank having a tracking-wheel thereon and having a bearing in the swath-board shoe and at its inner end provided with a crank-arm connected by a chain with the bar f^2 , back of where it is pivoted between its ends substantially in the manner as and for the purposes set forth.

2. The combination with the latch-lever L^3 , made substantially as described, of the shaft m' , having a bearing or support m^2 ; the crank-arm f' , provided with a link f^3 ; the curved bar f^2 , connecting with said link and extending frontwardly to connect with the ground-wheel stud in which said wheel turns, and pivoted at f^5 , to the bar f^6 , upwardly projected from the bar B^3 , a rod or shaft arranged in a recess in the shoe V; a crank j^5 on the outer end of said rod or shaft provided with a tracking-wheel j^6 , a crank j^4 , on the inner end of said rod or shaft making a connection with said bar f^2 , and the crank j^4 , substantially in the manner as and for the purposes set forth.

3. The combination with the interior gear I, of the vertically-arranged cover parts C^8 , and C^9 , which are hinged at their front to the crank-shaft sleeve, and are constructed with recesses for the passage of the axle-sleeve, and the upper cover part C^8 , having a passage for the pawl-shipper rod, and adapted to be secured at their rear ends; with said covers arranged to open or close upon its inner side the area inclosed by said interior gear I, substantially in the manner as and for the purposes set forth.

4. The combination with the axle-sleeve S' , of the inclosure e^4 , made integrally with said axle-sleeve, and connected by the web w^3 , at the rear of the said axle-sleeve, and having a top cover D^2 , and the vertically-arranged side cover parts C^8 , C^9 , arranged to open or close that side of said inclosure next adjacent to the interior gear I, substantially in the manner as and for the purposes set forth.

5. The combination of the coupler-bar B^3 hinged to the pitman crank-shaft sleeve of the shoe V, pivotally connected to the downturned end of the coupler-bar, in combination with the shaft j^2 having a crank on its inner end and a crank on its outer end having its bearings in the shoe V and the swath-board shoe and provided with a tracking-wheel arranged on its crank at the outer end of said rod or shaft and the ground-wheel f^8 having its stud f^7 pivoted to a bar f^2 , pivoted

to a bar upcast from the coupler-bar constructed and arranged to be operated substantially in the manner as and for the purposes set forth.

6. The combination with the latch-lever L^3 , attached at its lower end to a shaft having a bearing in which to turn, of a crank-arm connected to said shaft, a link connecting with said crank-arm, a bar pivoted to said link and extended frontwardly to connect with the stud in which the ground-wheel turns, said bar being pivoted intermediate its length to the coupling-bar, a shaft or rod adapted to be turned in a recess at the rear end of the shoe V, said shaft or rod at its outer end being provided with a bearing and a crank having a tracking-wheel thereon and at its inner end constructed with a crank and a chain connecting said bar with the crank on the inner end of the shaft or rod, substantially in the manner as and for the purposes set forth.

7. The combination with the latch-lever L^3 , made substantially as described; of the shaft M' , having a bearing or support m^2 ; the crank-arm f^4 , provided with a link f^3 ; the curved bar f^2 , connecting with said link and extended frontwardly to connect with the forked stud f^7 , in which the ground-wheel turns, and pivoted to a support at f^5 , on the bar B^3 ; a rod or shaft j^3 , arranged in a recess in the shoe V; a crank j^5 , on the outer end of said rod or shaft, provided with a tracking-wheel j^6 ; a crank j^4 , on the inner end of the said rod or shaft, and the chain j' , making a connection with the said bar f^2 , and the crank j^4 , substantially as and for the purposes set forth.

8. The combination with the inclosure E^5 , arranged to contain the interior pinion P^4 , and shipper-ring; of the cover part C^8 , hinged to the front end and adapted to be raised up edgewise; the cover part C^9 , also hinged at the front end and adapted to swing edgewise downwardly, and the set-screw T^5 , constructed and arranged to be operated substantially in the manner as and for the purposes set forth.

Signed at Troy, New York, this 16th day of November, 1889, and in the presence of the two witnesses whose names are hereto written.

JAMES PINE.

Witnesses:

CHARLES S. BRINTNALL,
W. E. HAGAN.