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E. M. KRUM.

MOWING OR REAPING MACHINE.

No. 412,274. Patented Oct. 8, 1889

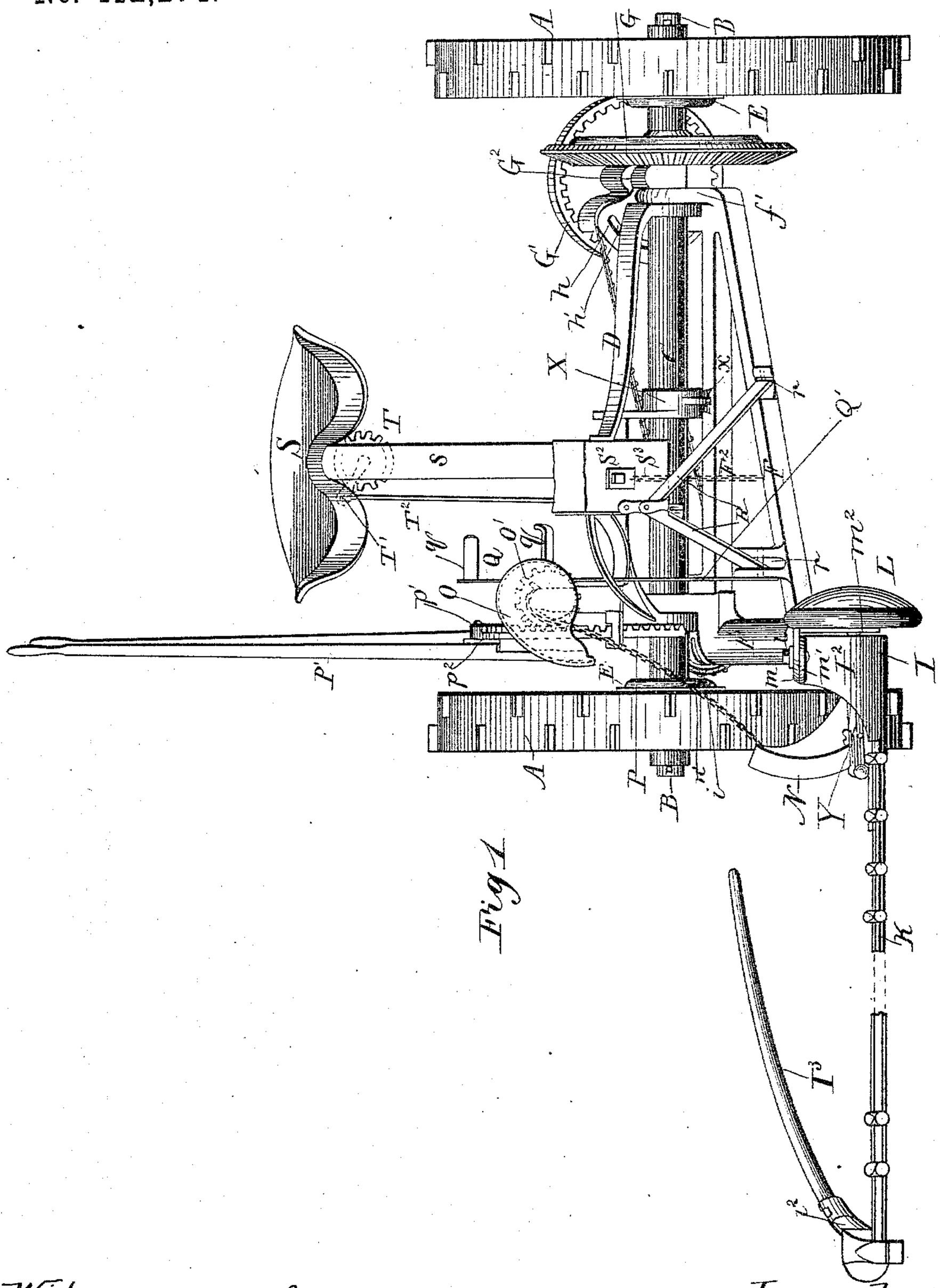

Fig 1.

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(No Model.) 4 Sheets—Sheet 2.

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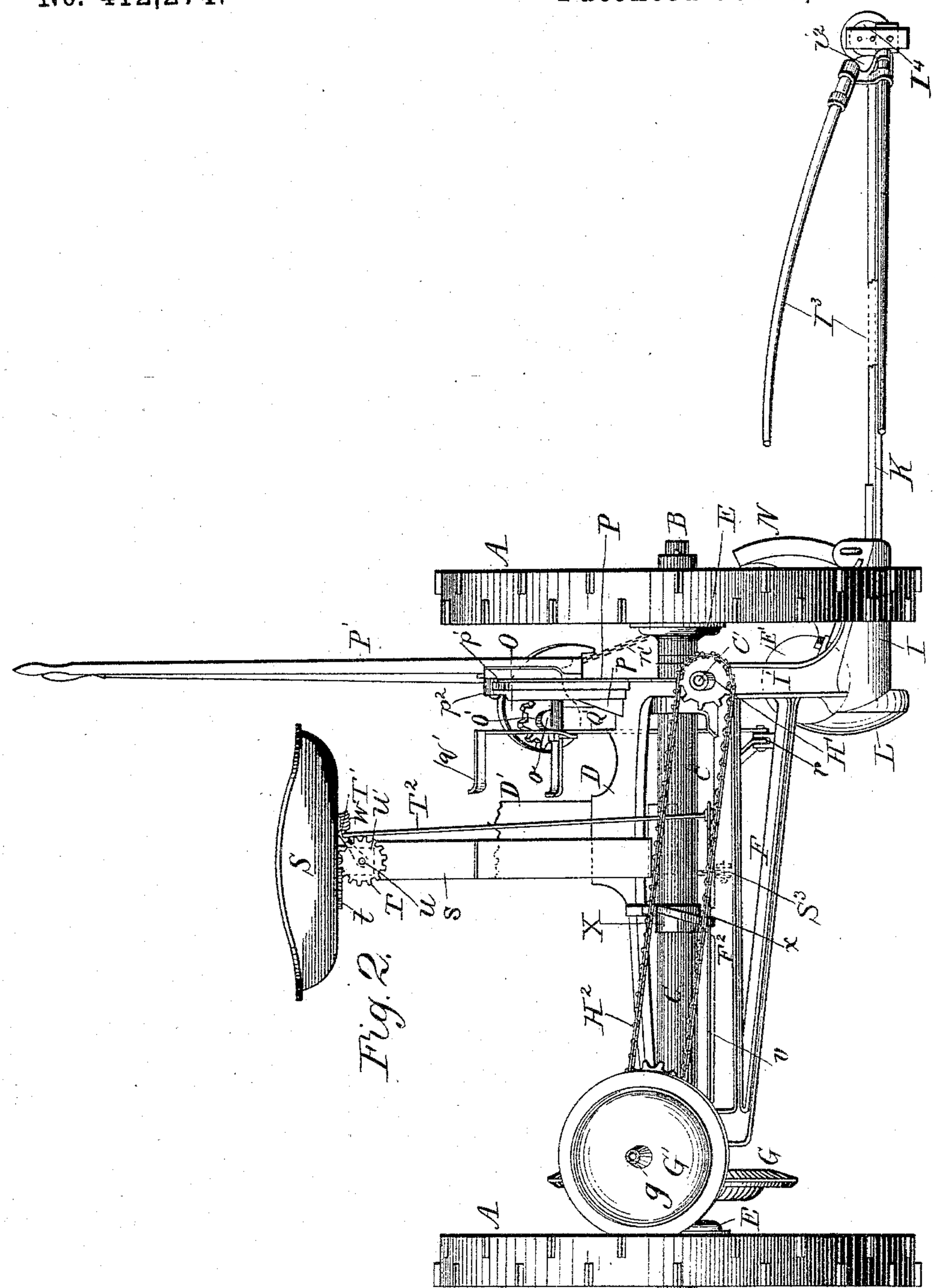

Fig. 2.

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(No Model.)

4 Sheets—Sheet 3.

E. M. KRUM.

MOWING OR REAPING MACHINE.

No. 412,274. Patented Oct. 8, 1889.

Fig. 7.

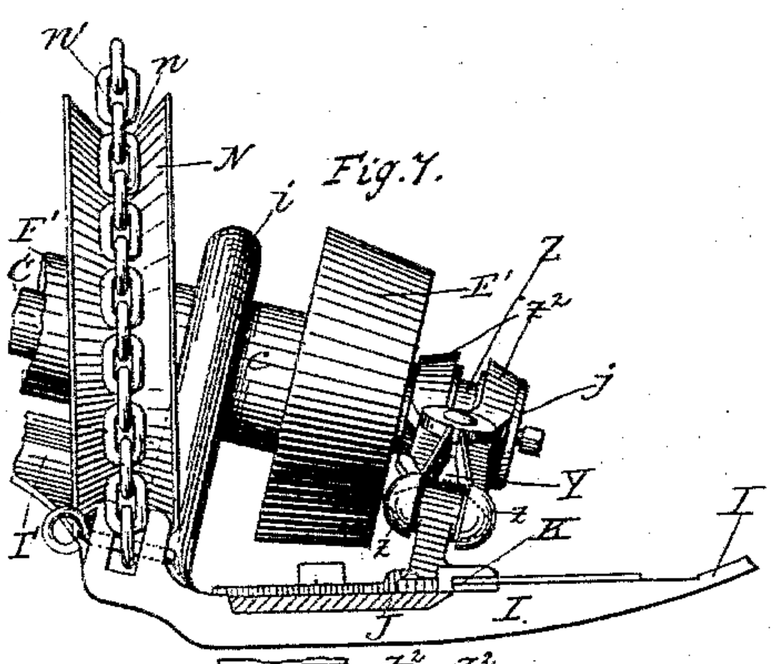


Fig. 8.

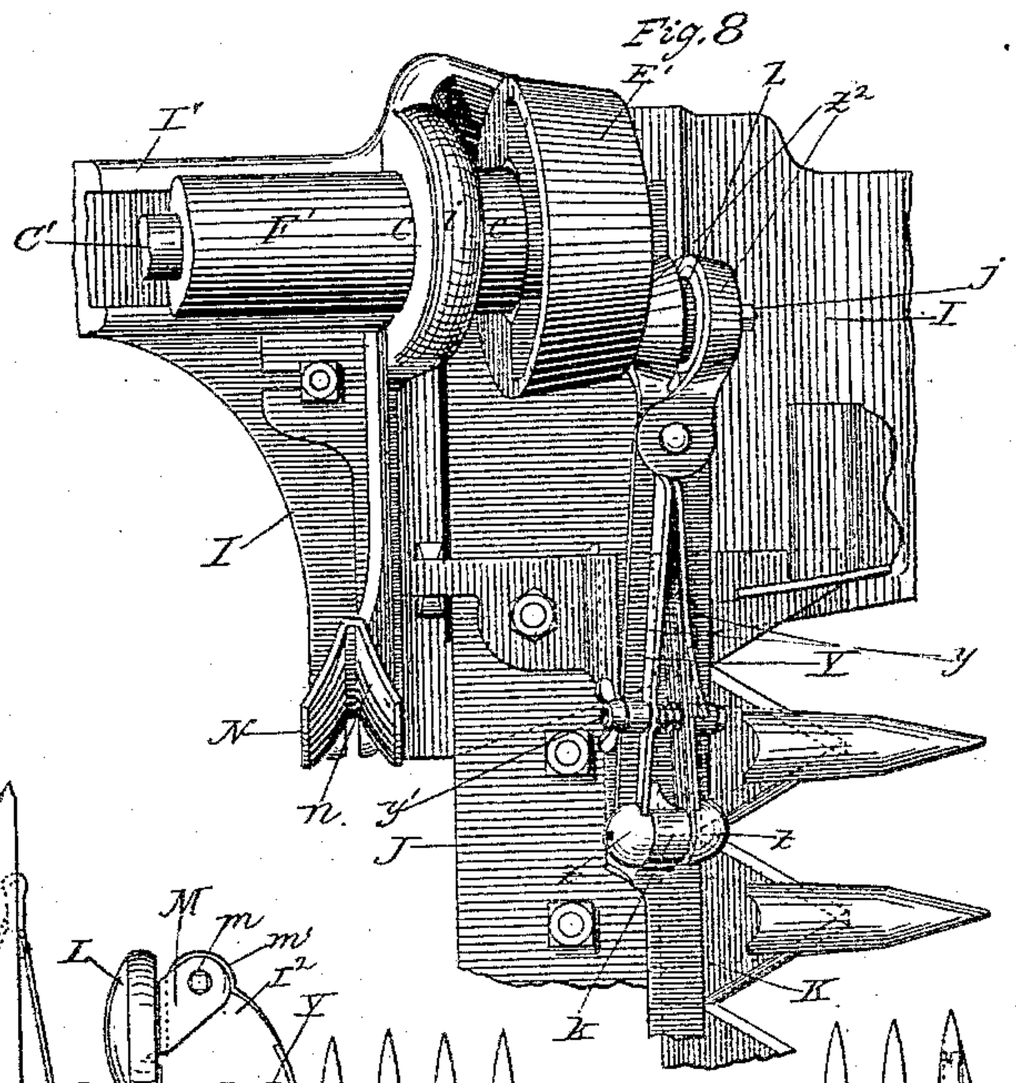


Fig. 9.

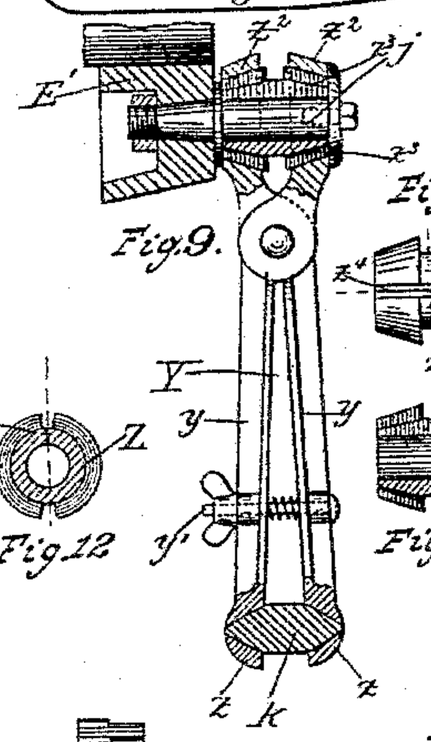


Fig. 10.

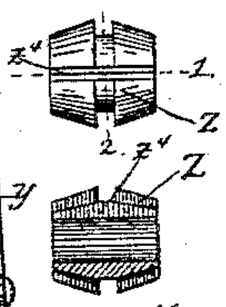


Fig. 12.

Fig. 11.

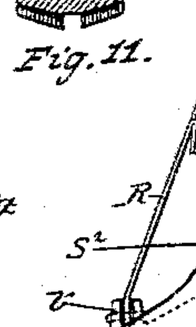
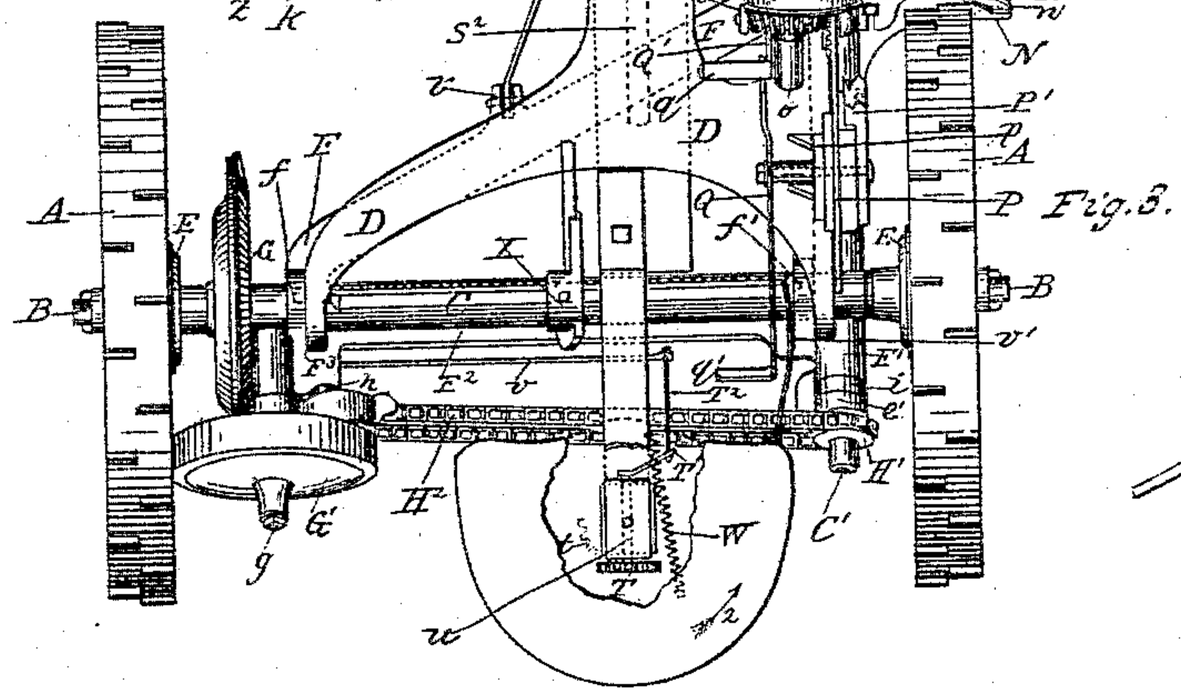


Fig. 5.



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(No Model.) 4 Sheets—Sheet 4.

E. M. KRUM.

MOWING OR REAPING MACHINE

No. 412,274. Patented Oct. 8, 1889.

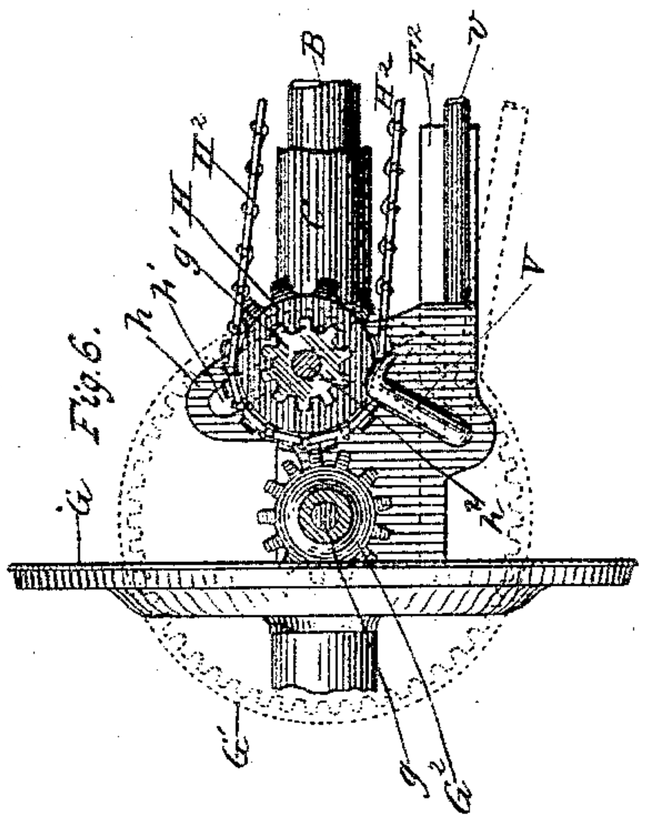

Fig. 6.

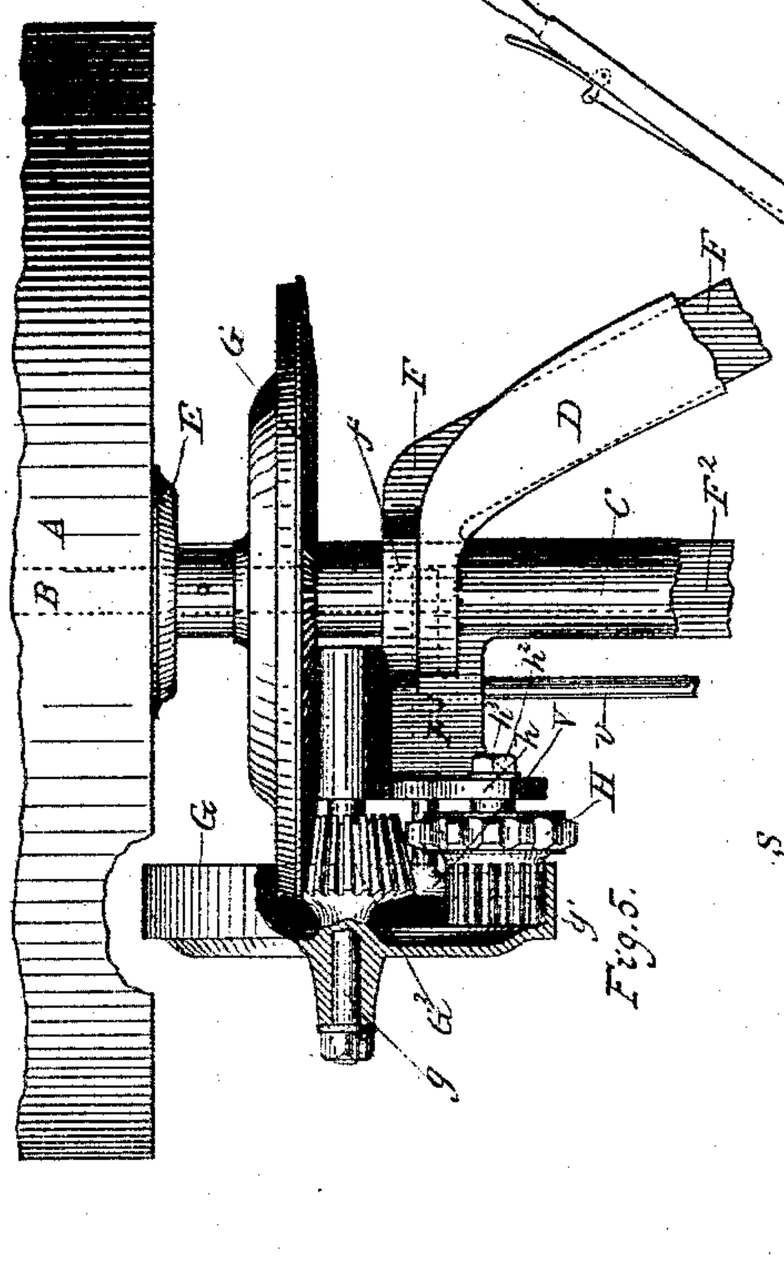

Fig. 5.

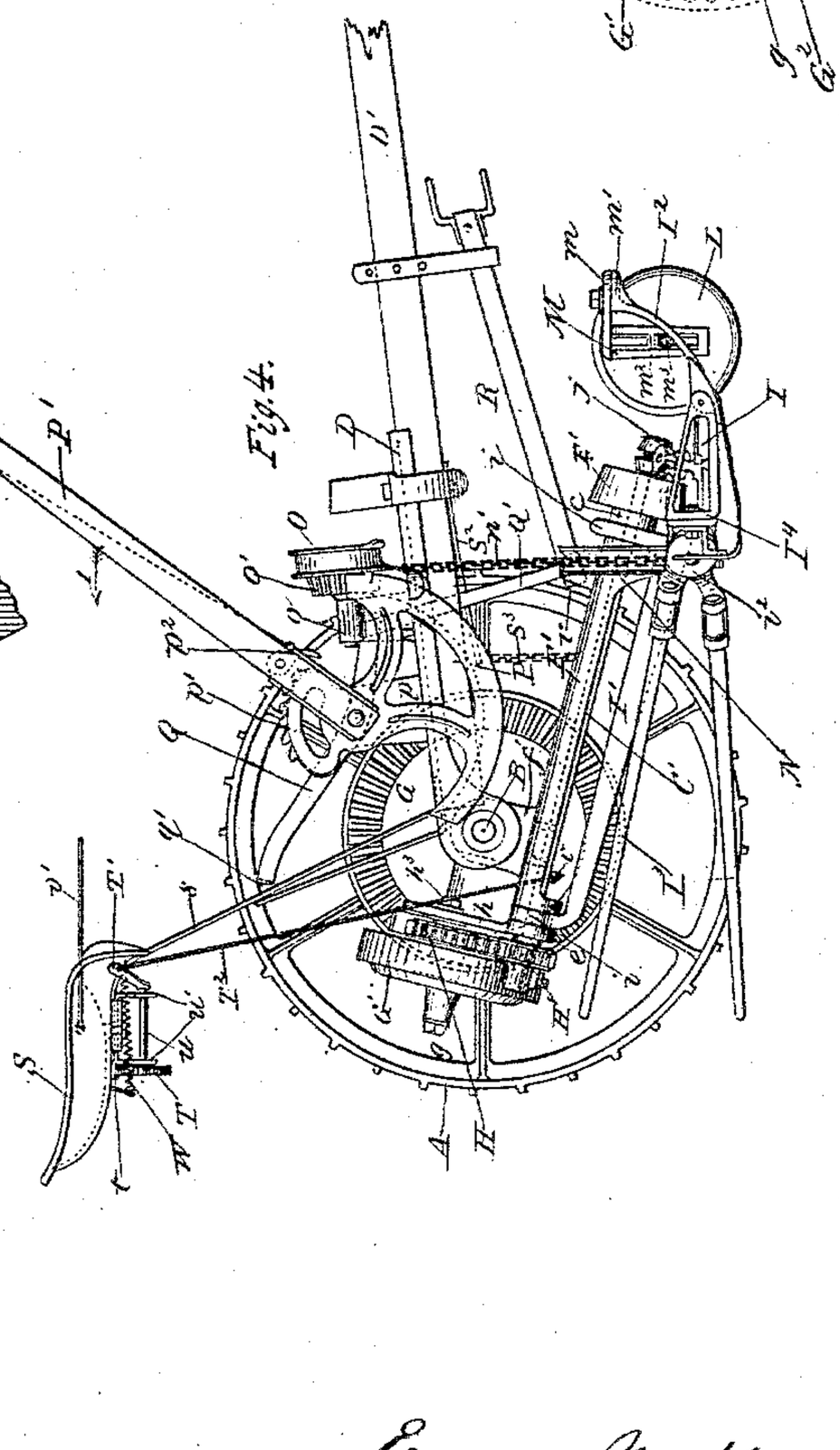

Fig. 4.

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Alex. Selkirk

UNITED STATES PATENT OFFICE.

EDWARD M. KRUM, OF OLD CHATHAM, NEW YORK.

MOWING OR REAPING MACHINE.

SPECIFICATION forming part of Letters Patent No. 412,274, dated October 8, 1889.

Application filed September 30, 1886. Serial No. 214,921. (No model.)

To all whom it may concern:

Be it known that I, EDWARD M. KRUM, a citizen of the United States, residing at Old Chatham, in the county of Columbia and State of New York, have invented certain new and useful Improvements in Mowing or Reaping Machines, of which the following is a specification.

My invention relates to improvements in mowing or reaping machines; and it consists of the devices and parts and combinations of devices and parts, hereinafter particularly described, and specifically set forth in the claims.

The objects of my invention are to provide in mowing or reaping machines certain means by which the driver can easily and at will control the operations of operating parts in the same, and also render certain parts more effective than heretofore; and, further, to combine certain elements with certain operating parts of the machine, whereby more advantageous operations will be had than heretofore, all of which will be hereinafter fully explained. I attain these objects by the means illustrated in the accompanying drawings, in which there are twelve figures, in all of which the same letters of reference refer to like parts throughout the several views.

Figure 1 is a front view of a machine embodying the improvements in this invention. Fig. 2 is a rear side view of the same. Fig. 3 is a view from above of the same. Fig. 4 is a side elevation of the same with one of the driving-wheels removed. Fig. 5 is an enlarged view of the gear mechanism, drive-wheel, axle-connections of the frames, and other co-operating parts. Fig. 6 is another view of the gear mechanism. Fig. 7 is an enlarged view of the adjuncts of the cutter-bar shoe and crank-shaft. Fig. 8 is a view of the crank-shaft connection with the cutter-bar from above. Fig. 9 is a sectional view of the pitman-wrist-pin box and sickle-bar pin. Fig. 10 is a side view of the wrist-pin box or bearing. Fig. 11 is a sectional view of the same, taken at line 1, Fig. 12. Fig. 12 is a sectional view taken at line 2 in Fig. 10.

Referring to the drawings, A A are the driving-wheels, and B is the main shaft or axle on which these wheels are loosely mounted. This axle has its bearings in sleeve C, and tongue-frame D connects pole D′ with said sleeve in the manner usually practiced by the trade. Wheels A A are each held in connection with the axle or shaft B by a friction-clutch E.

A floating frame composed of portions F F′ F^2 (shown by full and dotted lines in Figs. 1, 2, 3, and 4) is arranged relatively below the axle-sleeve C and tongue-frame D. This floating tongue-frame is preferably made with its portions F F′ F^2 connected as one piece and arranged relatively in the form of a triangle below the axle of the machine, and it is jointed with the axle or its sleeve by ears *f f′*, Figs. 1, 3, 4, and 5, so as to be capable of vibrating vertically to elevate or depress its forward end, with which the cutting mechanism is connected. Portion F of this frame runs diagonally from ear *f* to the front end of portion F′, which holds the crank-shaft C′, and portion F′ is extended rearwardly from the forward end of the crank-shaft in a direction relatively parallel with the sides of drive-wheels A, and is jointed with sleeve C by ear *f′*, as shown in Figs. 1, 3, and 4, and portion F^2 is arranged relatively below axle-sleeve C and extends from ear *f* of portion F to ear *f′* of portion F^2. A bracket F^3 is extended rearwardly from portion F^2 for supporting one portion of the gear mechanism, Figs. 1, 2, 3, 4, 5, and 6, for imparting motion to the crank-shaft. The end portions *c c* of portion F′ serve as bearings for crank-shaft C′. Bevel-gear G is connected with axle B so as to revolve with it.

Supported from bracket F^3, extended from portion F^2 of the floating frame, Figs. 5 and 6, is the internal gear G′ and bevel-pinion G^2, (preferably cast in a single piece,) mounted on a suitable spindle *g*, supported from bracket F^3, and pinion *g′*, working with the internal gear G′, and suitably connected with sprocket-wheel H and mounted on a suitable spindle and also supported from bracket F^3. The revolution of bevel-gear G will, through bevel-gear G^2 and pinion *g′*, revolve sprocket-wheel H.

Secured to the rear end of crank-shaft C′ is sprocket-wheel H′, which is geared with sprocket-wheel H by endless drive-chain H^2,

and secured to the front end of the same shaft is the balance crank-wheel E′, which operates, through a pitman, the sickle-bar.

I is the inner shoe connected with suspended arm I′, which latter is suspended from portion F′ of the floating frame by ears *i i*, Figs. 3, 4, 7, and 8. The shoe I being thus suspended by means of its arms I′ from the portion F′ of the floating frame, it can be readily oscillated from the latter in either direction, so as to carry the shoe sidewise upward from the ground and return.

Secured to shoe I is the finger-bar J, in which works the sickle-bar K. A wrist-pin *j*, secured with balance crank-wheel E′, operates with a pitman to impart to the sickle-bar a reciprocating motion. When the shoe I, by its arm I′, is oscillated outwardly and upwardly, it will carry with it the entire cutting apparatus and elevate the outer end of the same accordingly.

In the nose I² of shoe I is secured the caster-wheel L, Figs. 1, 3, and 4. This caster-wheel is connected with the nose of said shoe by the angular bracket M, the horizontal limb *m* of which is pivoted to bracket *m′* at the end of nose I², while the vertical limb *m*² is slotted and provided with an adjustable spindle *m*³, on which the caster-wheel revolves. By means of a screw-threaded nut on spindle *m*³ the latter can be adjusted at will to different heights above the surface of the ground, so as to carry the shoe at a corresponding distance above the same, and by the pivoting of the horizontal limb of bracket M with the shoe the caster-wheel is rendered free to vibrate horizontally.

Secured to the rear side of shoe I, and projecting outwardly from the same, is the curved lifting-arm N, Figs. 1, 2, 3, 4, 7, and 8, having groove *n* for receiving lifting-chain *n′*. Chain *n′* connects with the volute-shaped lifting-cam O. This cam is connected with gear O′, (preferably a bevel-gear,) and is mounted on a spindle held by a suitable bracket *o*, projected upward from frame D, as shown in Fig. 4.

Pivoted to bracket *p*, projected upward from tongue-frame D, is segment-gear P, working with gear O′, connected with volute cam O. Made with the segment gear-piece are ratchet-teeth *p′*, and lever-handle P′, provided with pawl *p*², operated by a lever-latch and connecting-rod in the manner usually practiced by the trade, enables the driver to operate at will the segment-gear and through it and its coacting gear O′ revolve the volute cam O to cause it to wind up chain *n*, and thereby cause the arm I′ of shoe I (which carries the cutting apparatus) to swing upwardly and outwardly by its ears *i i* from portion F′ of the floating frame, when the cutting apparatus will be elevated from a horizontal position to a vertical one, when the cutting apparatus can be readily moved to a short distance past a vertical position, so as to be slightly inclining, and thereby obviate the use of a locking device for holding the said cutting apparatus up, and when the cutting apparatus is turned up from a horizontal position the curved lifting-arm N will be in reversed position on opposite side of portion F′ of the floating frame, with the end of lifting-chain (connected with the shoe) relatively inward past the line of arm I′, while the opposite end of said chain will have contact with the external portion of the volute cam. A return of the cutting apparatus to a horizontal position will be effected by reversed operations of the handled lever P′.

Q is a duplex lever (shown in Figs. 1, 2, 3, and 4) arranged relatively forward of the driver's seat, so that both its treadles *q q′* can be reached by the driver's feet. This lever is pivoted to bracket *p*. Connecting-bar Q′ connects the forward end of this lever Q with the forward end of the floating frame, as shown in Figs. 1 and 4. The pressure of the driver's foot on the forward treadle *q* will depress the forward end of the floating frame, and consequently shoe I and the heel end of the cutting apparatus carried by it. When the pressure is transferred to the rearward treadle *q′*, the forward end of the floating frame will be elevated, when the shoe and heel end of the cutting apparatus will be correspondingly elevated. When the forward treadle *q* is operated at the time lever-handle P′ is moved to a short distance, the heel end of the cutter-bar will be kept to the ground, while the outer end of the said cutter-bar will be raised to pass any projecting substance; but when rear treadle *q′* is depressed and lever-handle *p′* is idle, the heel end of the cutter-bar will be raised, so as to pass over any projecting substance at or near the heel of the cutter-bar. By operating lever P′ to a short distance at the same time the rear end of the duplex lever Q is depressed the cutter-bar will be raised in its entire length to a corresponding position above the ground. It will therefore be readily understood that by means of the lifting mechanism operated by lever P and the duplex lever Q the driver has full control of the cutting apparatus, and can, at will, elevate or depress the same, or raise or depress its outer end only, or only elevate or depress its heel or shoe end of the same, as may be desired.

R is a bifurcated draw-bar having its upper end supported in a suitable loose manner from pole D′, while the ends of its limbs *r r* are jointed to the diagonal portion F of the floating frame, as shown in Figs. 1, 3, and 4. By this bifurcated draw-bar the draft of the animals is applied directly to the floating frame instead of to the main frame or pole, and this floating frame will not be in the least affected by the relative rise or fall of the pole when the machine is being drawn over uneven surfaces of the ground, while the shoe I of the cutting apparatus will be maintained to the elevation set by the adjustment of the caster-wheel without being materially raised or low-

ered by the draft of the animals or the movements of the pole.

With the means of applying the draft of the animals to the machine the pole is employed simply to guide the machine for turning the same and for properly supporting the devices which are attached to the tongue-frame D.

Mounted on standard *s*, projecting above the tongue-frame, is driver's seat S, which is pivoted to the horizontal end portion of standard *s*, so as to be capable of turning in direction of arrow 2. On the lower side of seat S are gear-teeth *t*. (Shown in Fig. 2, and indicated by dotted lines in Fig. 3.) These gear-teeth operate gear T, Figs. 1, 2, 3, and 4, mounted on shaft *u*, which is supported by brackets *u' u'*, connected in a suitable manner with standard *s*. Secured to the forward end of shaft *u* is a crank-lever T', and jointed with the free end of this crank-lever is rod T^2, which is jointed with the horizontal arm *v* of dog V, Figs. 5 and 6. This dog V is pivoted in a suitable manner with bracket F^3, as shown illustrated in Figs. 5 and 6, and when arm *v* is in a horizontal position, as shown by full lines in Fig. 6, this dog will be out of engagement with the cogs of the internal gear G'; but when said arm is depressed the dog will engage with said gear and hold the same from revolving

W is a spring connecting with seat S and its standard. This spring tends to turn seat S in direction of arrow 2 and hold it turned with its front side toward the gear G', and when the seat turns in direction of arrow 2 the gear made with the seat will operate gear T, actuating crank-lever U, and effect a depression of the arm *v* of dog V, and throw the latter in with the teeth of the internal gear G and hold it from revolving; but when the seat is turned to position facing the front of the machine the gears *t* T will, through crank-lever T' and connecting-rod T^2, operate to hold dog V out of engagement with the teeth of said gear, so that it can fully revolve. At a side of the seat is fixed a reacting lever *v'*, Figs. 3 and 4, which projects forward so as to have bearing along the side of the driver's leg, to aid him to hold the seat facing the front of the machine. Whenever the seat is turned so as to face toward gear G, the dog V will be thrown into engagement with the internal gear and hold the same from transferring motion from the bevel-gear G to the cutting apparatus. It will be readily seen that should the driver from any cause fall from the seat the spring W will turn the seat on its pivot and thereby cause the gear mechanism T *t* and crank-lever T' to throw dog V into engagement with the internal gear G', and thereby stop the movement of the cutting apparatus and prevent the driver from being injured by it. Another advantage is that when the driver is off the seat the seat will be in position for holding the dog V in locking-engagement with gear G, when the driving-wheels will be held from revolving forward. In this case the mechanism operates as a brake to the wheels, and will check the animals from readily starting off with the machine in the absence of the driver.

I provide with bracket F^3, Figs. 5 and 6, an adjustable sprocket-wheel bracket *h*, which is pivoted on the stud or spindle *g* of the internal gear G'. This bracket is provided with curved slot *h'*, which receives the spindle h^2 of the sprocket-wheel H. This spindle h^2 is made with a shoulder and a tightening-nut h^3, by which it can be readily fixed after the said bracket *h* has been adjusted. By means of this adjustable sprocket-wheel bracket the slack of the sprocket-chain can at any time be taken up.

X, Figs. 2 and 3, is a shifting cam mounted on sleeve C and working in notch *x*, made in portion F^3 of the floating-frame. This cam has a throw sufficient to move the floating frame to a distance sidewise from the bevel-gear G equal to the depth of the cogs in the same, so as to move the bevel-pinion G^2 out of engagement with said gear, when the driving-wheels of the machine will be free to revolve without imparting motion to other mechanism of the machine.

Y is the pitman for connecting the wrist-pin of the balance crank-wheel E' with the reciprocating sickle-bar K. This pitman consists of the pivoted lever-jaws *y y* and tightening screw-bolt *y'*, Figs. 7, 8, and 9. The long ends of these lever-jaws are made with recessed jaws *z*, preferably conical-shaped, as shown in Fig. 9, and they hold the conical ends of a pivot or pin, which passes through the ear *k*, Figs. 7 and 8, made with the heel end of the sickle-bar. The opposite ends of these lever-jaws are made with conical cup-shaped recesses z^3 and receive the conical-shaped box-bearings Z of the wrist-pin. These bearings are preferably made as illustrated in Figs. 10, 11, and 12, in which two opposite sides are slotted in direction of the axes of the bearings to within a short distance from being through the shell, while with one of these slotted sides is slit z^4 through to the bore of the bearing. Whenever either the conical ends of the pivot-pin or those of the bearing Z become worn the pitman can be readily tightened on the same by screwing the nut on the tightening-bolt *y'*.

The track-clearers I^3 are held in sockets i^3, suitably connected, as practiced by the trade, with a bracket i^2, which is adjustably pivoted to the heel of the outer shoe I^4, and is held with the same by a screw-bolt, which can be loosened and tightened at will to permit the adjustment of the track-clearer to any desired position for clearing a good track.

Connected with the main frame or pole and attached to the same and arranged between the same and the floating frame is the elastic holder consisting of a suitable spring S^2, secured to the main frame or pole, and a suspension-chain S^3, (or jointed rod,) which con-

nects the said spring with the floating frame. This device operates to give to the forward end of the floating frame an elastic support, so as to cause the shoe I to bear more lightly on the ground than it would without this support.

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

1. In a mowing or reaping machine, the combination, with a revolving axle, drive-wheels connected with said axle by friction-clutches, a drive-gear fixed to the axle, and a sleeve loosely mounted on the latter, of the floating frame pivoted on said sleeve so that the said frame can be moved in either way in the direction of said sleeve, and a bracket connected with said floating frame and projecting rearward of the axle and supporting the gears, which are actuated by the drive-gear secured to the axle, whereby the floating frame can at will be made to carry the drive-gear mechanism into or out from engagement with the constantly-revolving drive-gear on the axle, substantially as and for the purposes set forth.

2. In a mowing or reaping machine, the combination, with the drive-gear fixed to the main axle and revolved by drive-wheels, and a sleeve loosely mounted on said axle, of a floating frame pivoted on said sleeve so as to be moved endwise at will in either direction, brackets secured to the rearward end of the floating frame, gear mechanism supported by said brackets, and sprocket-wheel H, actuated by the drive-gear, sprocket-wheel H′, secured to the crank-shaft and driven by drive-chain H^2, actuated by sprocket-wheel H, and a lever for moving said floating frame endwise, substantially as and for the purposes set forth.

3. In a mowing or reaping machine, the combination, with the drive-gear fixed to the main axle, a sleeve loosely mounted on said axle, a floating frame pivoted on said sleeve and adapted to be moved in direction of the axis of the latter, the driven-gear mechanism carried by a bracket secured to the rear end of the floating frame so as to be moved with it, of a sprocket-wheel carried by an adjustable arm and driven by the driven-gear mechanism, and the second sprocket-wheel fixed on the crank-shaft and revolved by a chain belt actuated by the first sprocket-wheel, substantially as and for the purposes set forth.

4. In a mowing or reaping machine, the combination, with the crank-shaft, of floating frame pivoted to a sleeve loosely mounted on the main axle, the arm I′, suspended and pivoted from portion F′ of said floating frame, having the crank-shaft bearings, the inner shoe connected with said suspended arm, the tongue-frame, the progressive coil-shaped cam O, pivoted to a bracket connected with said tongue-frame, chain n', pinion O′, segmental gear P, and lever P′, all substantially as and for the purposes set forth.

5. In a mowing or reaping machine, the combination, with the floating frame, the sleeve loosely mounted on the main axle to which the said frame is pivoted, the crank-shaft supported in bearings on the floating frame, and a tongue-frame pivoted to said sleeve, of the bifurcated draw-bar connected with the diagonal limb of the floating frame at two points on opposite sides of the tongue, a loop for supporting the forward end of said draw-bar, and a device for attachment of animals to the draw-bar, substantially as and for the purposes set forth.

6. In a mowing or reaping machine, the combination, with the main-axle sleeve loosely mounted thereon, floating frame pivoted on said sleeve, a tongue-frame also pivoted on said sleeve, arm I′, suspended and pivoted from said floating frame, inner shoe I, and cutter-bar J, of the bifurcated draw-bar connected with the diagonal limb of the floating frame at two points on opposite sides of the tongue, and means for attachment of animals to said draw-bar, substantially as and for the purposes set forth.

7. In a mowing or reaping machine, the combination, with a drive-gear fixed to the main axle, and a sleeve loosely mounted upon said axle, of a floating frame pivoted on said sleeve and carrying the crank-shaft, driven gearing actuated by the drive-gear fixed to the main axle, sprocket-wheel H, driven by said driven gearing, sprocket-wheel H′, secured to the crank-shaft and actuated by the drive-chain H^2, located rearwardly of the sleeve, as described, cam X, rigidly fixed upon said sleeve and provided with a lever, and the notch x in the floating frame, whereby the driven gear can at will be thrown into or out of engagement with the drive-gear on the main axle, substantially as and for the purposes set forth.

8. In a mowing or reaping machine, the combination, with the pitman Y, constructed as described, of the lever-jaws $y\,y$, pivoted together and provided with the tightening-bolt and having conical-formed recessed jaws z at one end, and the conical-shaped box-bearing Z, interposed between the wrist-pin and the jaws of the pitman, substantially as and for the purposes set forth.

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