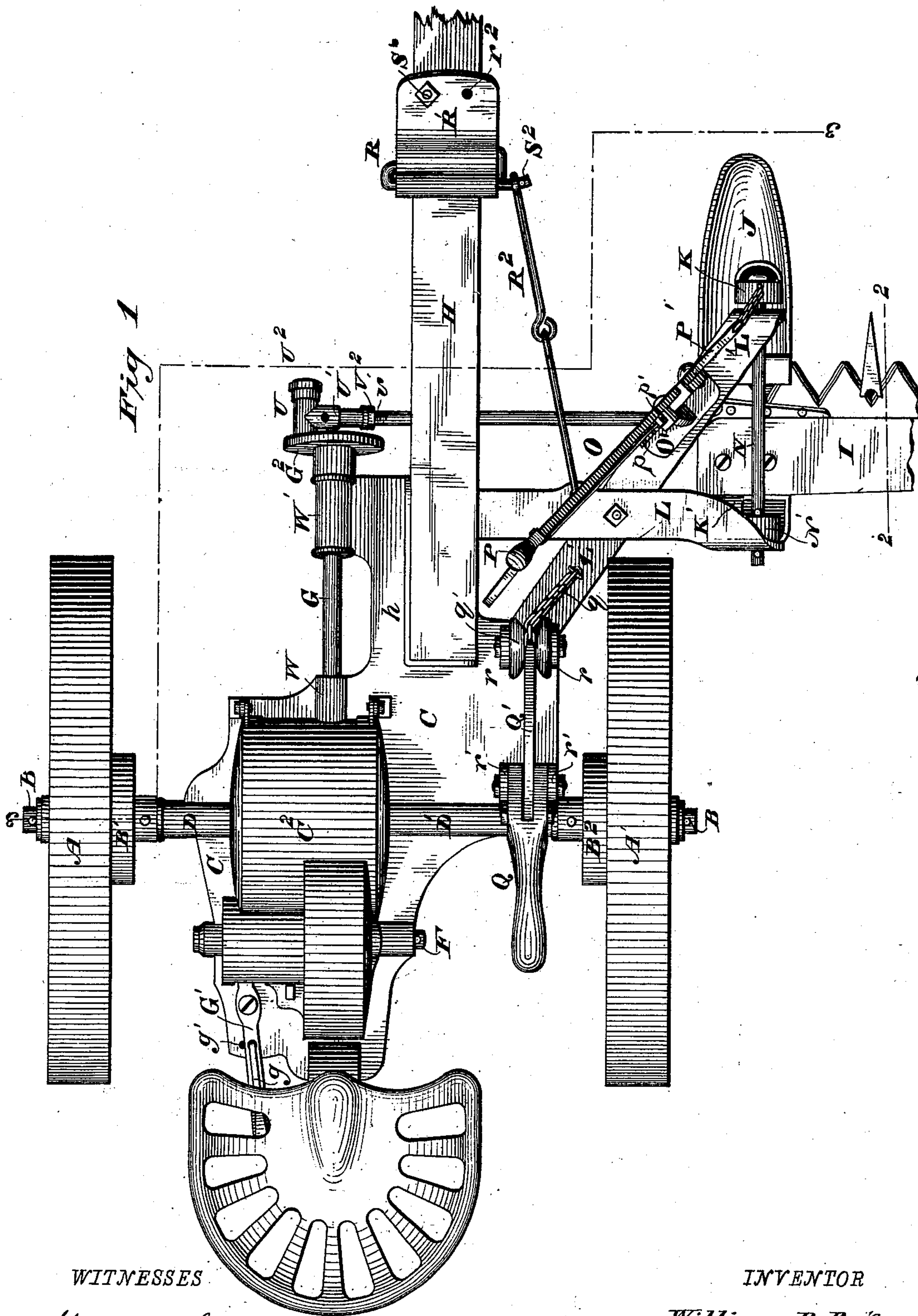


W. R. BAKER.
Mower.

No. 210,232.

Patented Nov. 26, 1878.



WITNESSES

Wm A Skinkle
Geo W Buck del.

INVENTOR

William R Baker.

By his Attorneys

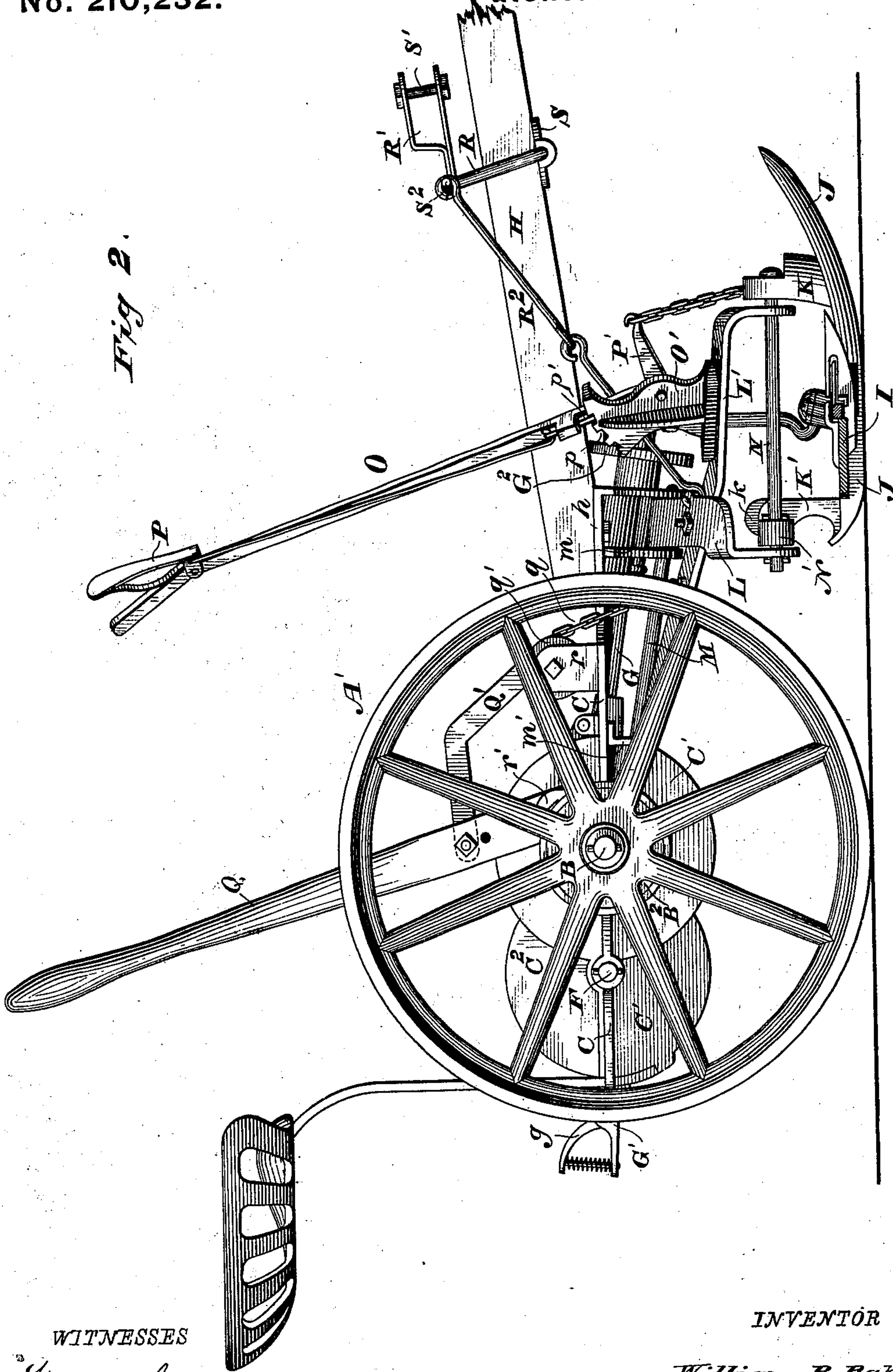
Baldwin, Hopkins & Peyton.

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Fig 2.



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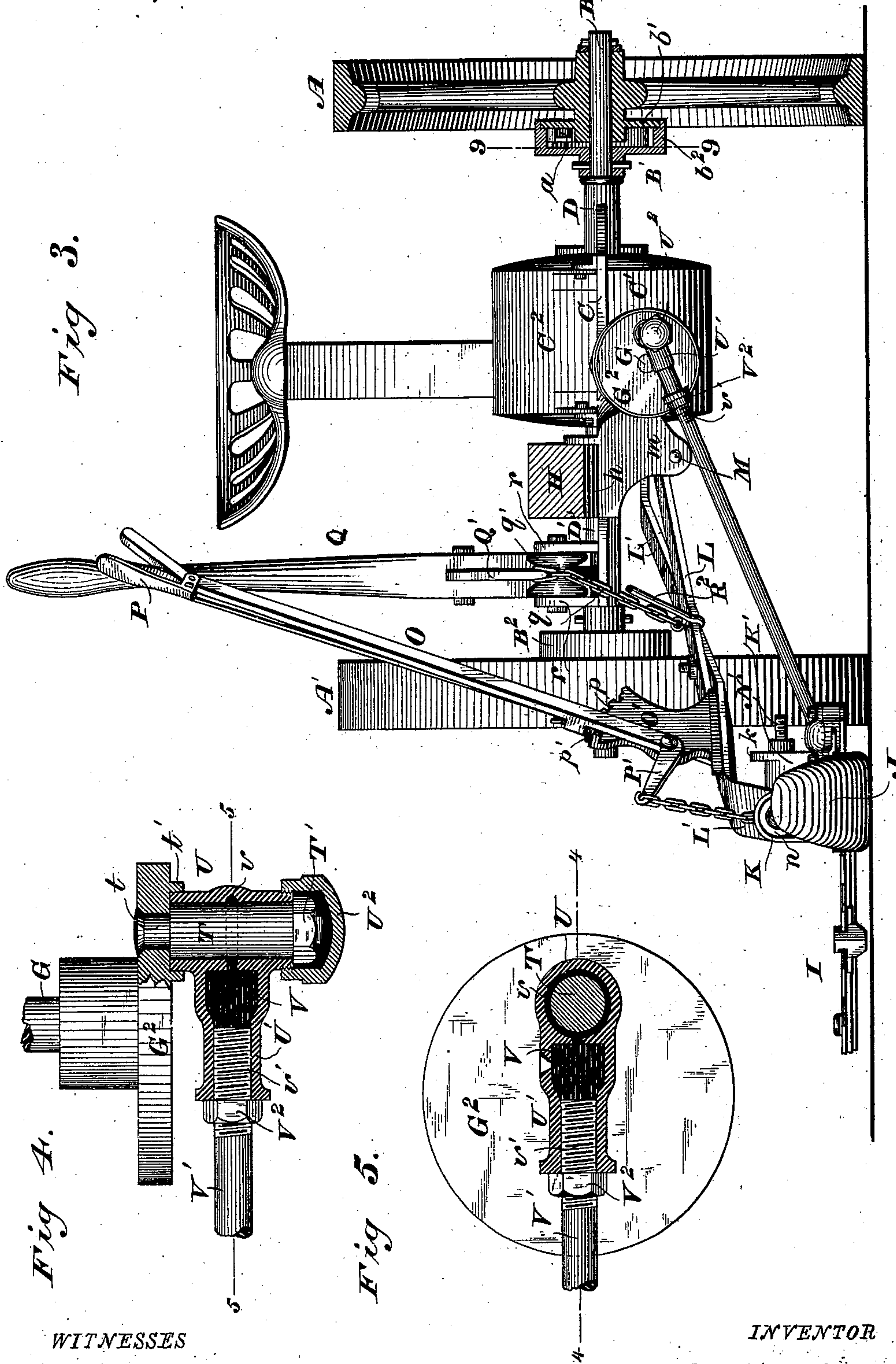


Fig 4.

Fig 5.

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Fig 6.

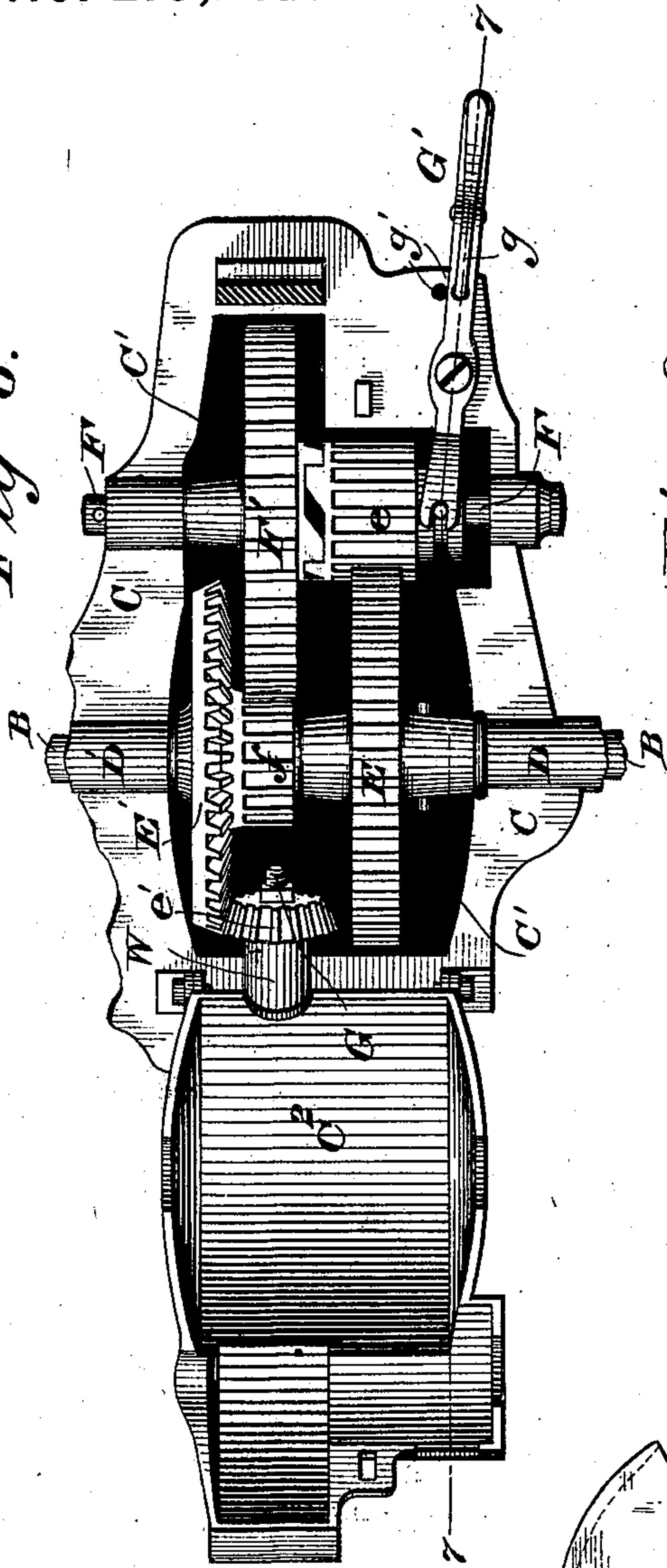


Fig 8.

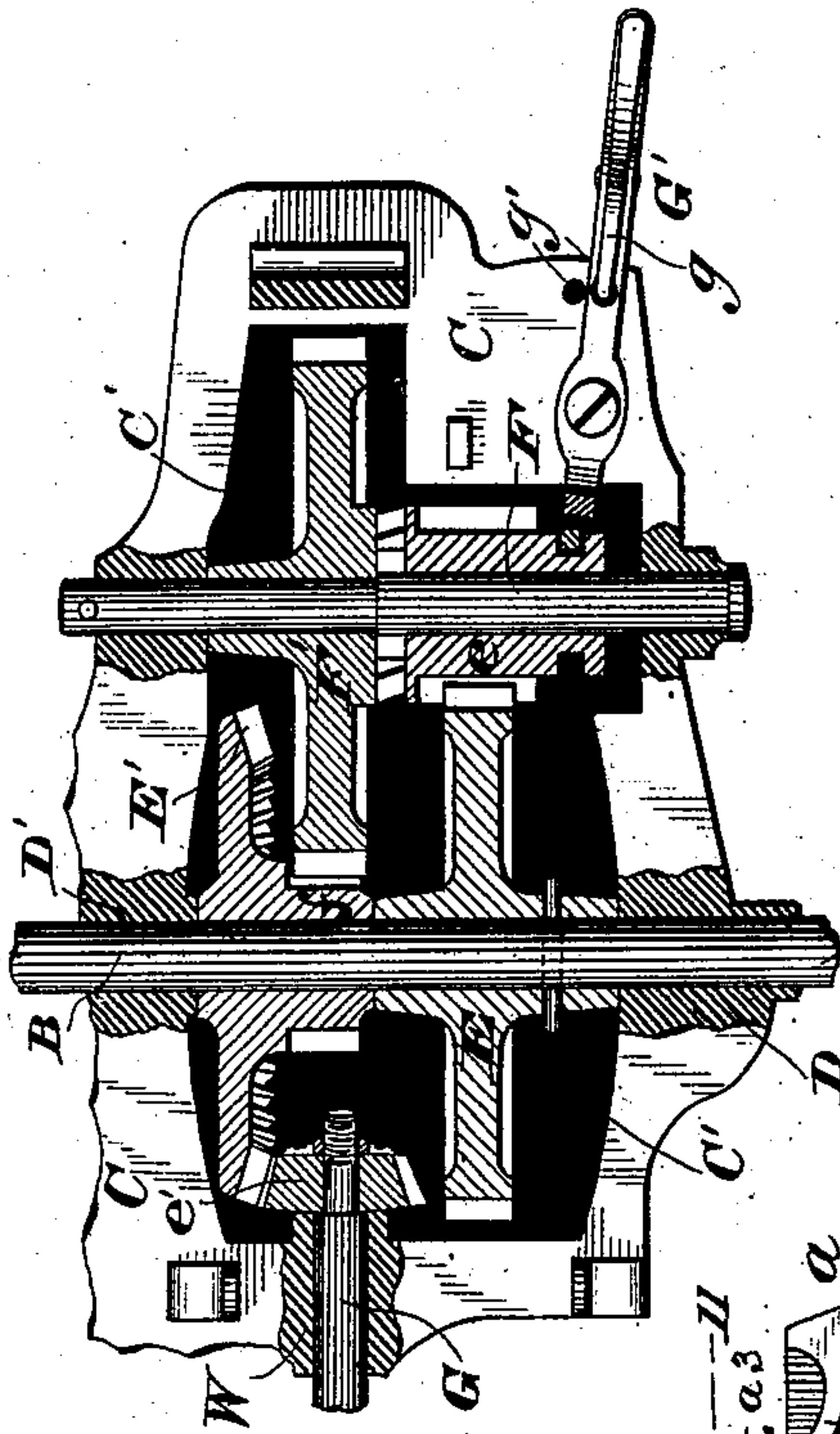


Fig 9.

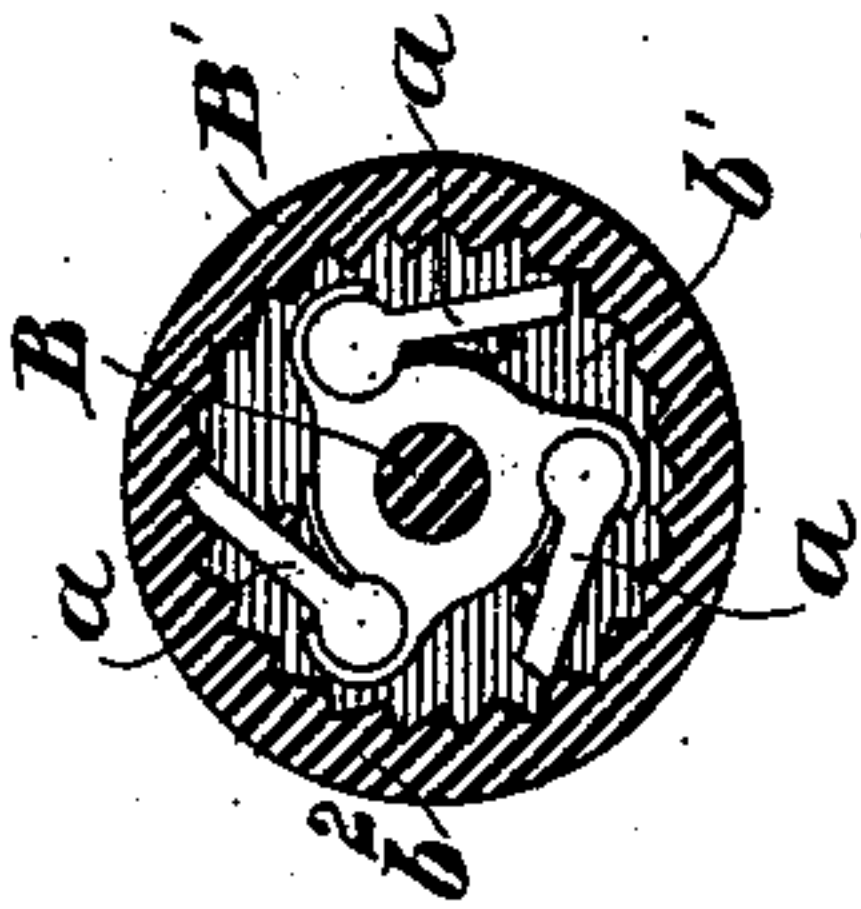


Fig 7.

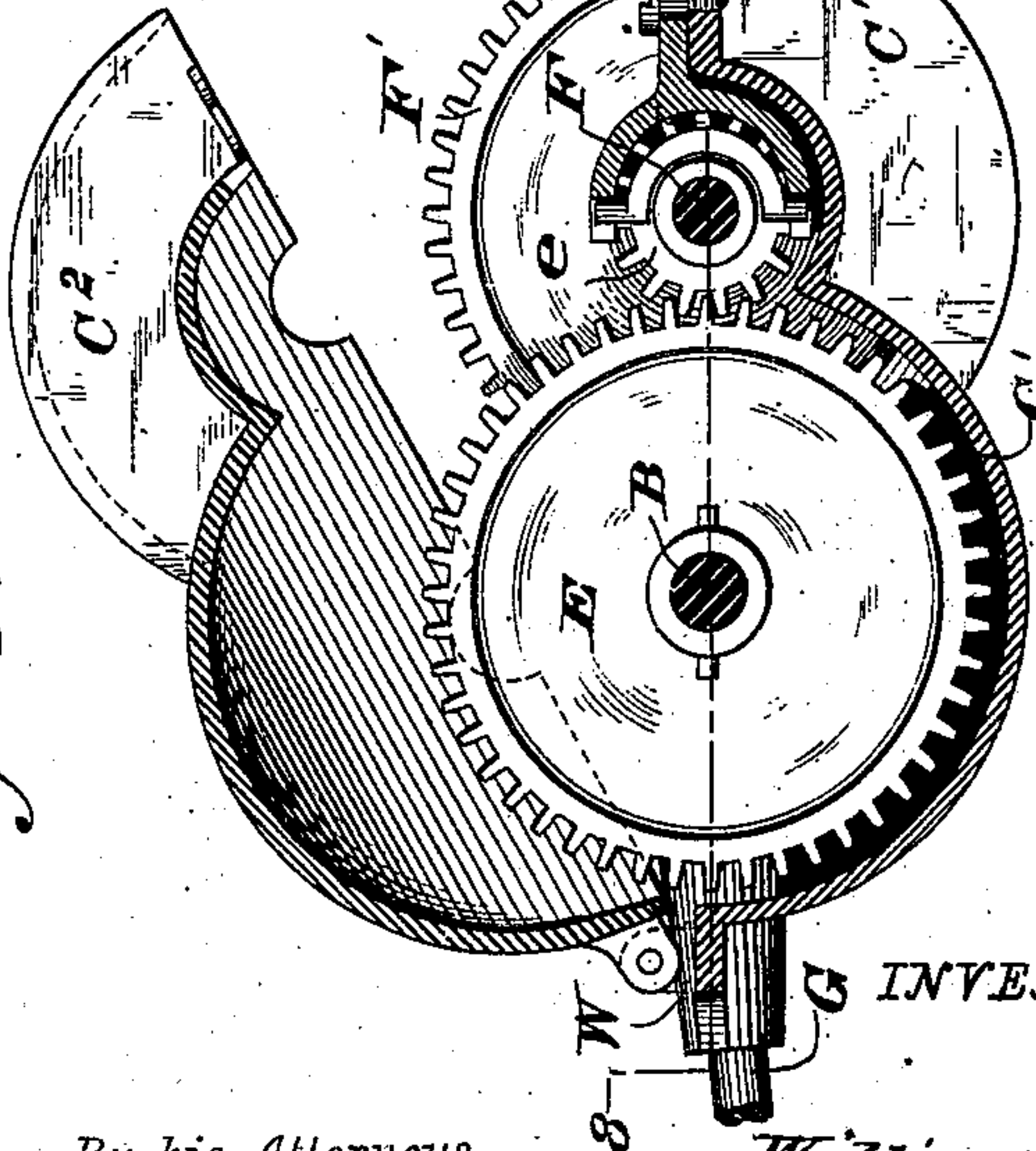


Fig 10.

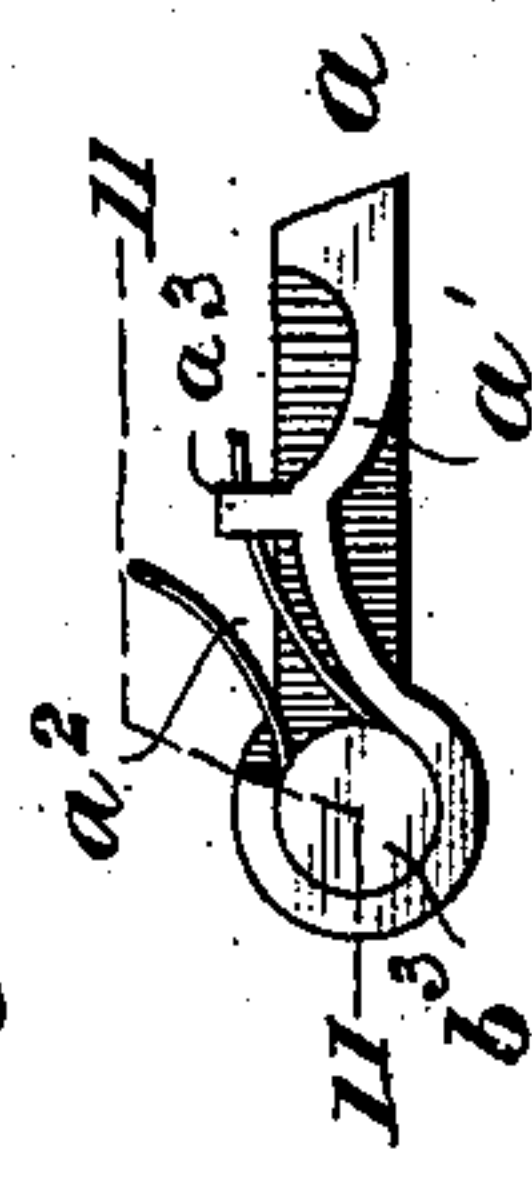
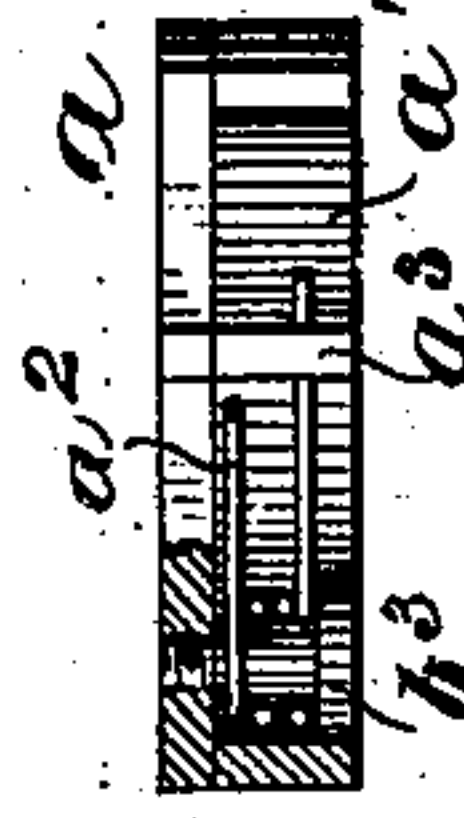


Fig 11.



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UNITED STATES PATENT OFFICE.

WILLIAM R. BAKER, OF CHICAGO, ILLINOIS, ASSIGNOR TO C. H. & L. J. McCORMICK, OF SAME PLACE.

IMPROVEMENT IN MOWERS.

Specification forming part of Letters Patent No. **210,232**, dated November 26, 1878; application filed October 26, 1878.

To all whom it may concern:

Be it known that I, WILLIAM R. BAKER, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Harvesters, of which the following is a specification:

My invention relates to improvements in mowing-machines, or that class of harvesters especially designed for cutting grass, in which the laterally-projecting hinged cutting apparatus is in advance of the supporting-wheels; and my objects, generally, are to provide a strong, cheap machine, and one which shall be simple in construction and thoroughly under the control of the driver in operation. Specifically my objects chiefly are to facilitate the rocking of the cutting apparatus, to improve the attachment or connection of the crank-wheel and pitman, and to lessen side draft.

My improvements will hereinafter first fully be described, and the subject-matter which I deem novel then specifically claimed.

In the accompanying drawings all my improvements are shown as embodied in a fully-organized harvester, such as I prefer to ingraft my invention upon.

Obviously, however, some of the improvements may be used without the others, and in machines differing in some respects from that therein shown and hereinafter specifically described.

Figure 1 is a plan or top view, the tongue being broken away and part only of the cutting apparatus shown; Fig. 2, a side elevation, as seen from the inner or cutting-apparatus side of the machine, with the finger-beam and cutter-bar in section on the line 2 2 of Fig. 1; Fig. 3, a front elevation, with parts in vertical section on the line 3 3 of Fig. 1. Fig. 4 is a view, partly in plan and partly in section, on the line 4 4 of Fig. 5, showing the details of the connections between the crank-wheel and pitman; Fig. 5, a view of the same parts, partly in front elevation and partly in section, on the line 5 5 of Fig. 4. Fig. 6 is a view showing the gear-casing portion of the main frame, with the top or cover thrown open to show a top or plan view of the gearing; Fig. 7, a view of the same parts, partly in side

elevation and partly in section, on the line 7 7 of Fig. 6, the gear-box cover being partially opened; Fig. 8, a horizontal section through the gearing and casing on the line 8 8 of Fig. 7. Fig. 9 is a section on the line 9 9 of Fig. 3, showing one of the backing-ratchets, and exposing to view the inner sides or faces of the pawls or their surfaces next the ratchet-wheel on the axle. Fig. 10 is a longitudinal view, on a considerably enlarged scale, of one of the backing-ratchet pawls, as seen from the outer side or edge, showing that surface or face of the pawl next the hub of the driving-wheel; and Fig. 11, a longitudinal view of the pawl at a right angle to Fig. 10, and partly in section on the line 11 11 of said figure.

The driving and supporting wheels A A', mounted loosely on the main axle B, are connected therewith by backing-ratchets B¹ B² for a well-known purpose. Any of the usual and suitable forms of backing-ratchets may be employed. Those shown in the drawings, and which I prefer to employ, are of somewhat peculiar construction, as will hereinafter be explained.

A metallic main frame, C, is by preference composed of a single casting. A half-box or partial gear-casing, C¹, is formed with the frame. A hinged cover, C², completes the gear-casing. This cover is the counterpart of the half-box or cavity of the main frame, and is hinged at its front to the front end of said cavity, so that the cover may be opened and thrown back when it is desired to expose the gearing by which motion is communicated to the cutters.

The axle B crosses the gear-casing or cavity C¹, and is mounted in suitable sleeve-bearings D D' in the frame C.

A main gear or driving pinion, E, fast on the axle, meshes with and imparts motion to a long or broad faced shifting or clutch pinion, e, on a counter-shaft, F, mounted at its ends in suitable bearings in the main frame, in rear of the axle, and spanning the gear-casing or cavity in the frame.

The pinion e is loose on its shaft, so that it may be moved endwise by a suitable shifting-

lever to clutch it with or disconnect it from a larger pinion, F' , also loose on the counter-shaft. This pinion F' meshes with and drives a small pinion, f , loose on the axle, and formed with or attached to a larger bevel-pinion, E' , which meshes with and drives a corresponding, but smaller, pinion, e' , fast on the end of a crank-shaft, G . By means of a shipping-lever, G^1 , provided with a suitable detent, g , and connected with a sleeve at one end of the pinion e , this pinion may be clutched with the pinion F' , and held in connection with it, and be disconnected and locked in its inoperative position, as is well understood, for obvious purposes.

The lever G^1 is within easy reach of the driver when in his seat, so that he may readily operate the lever and cause its detent to engage with one or the other of two holes, g' , in the frame, according to whether the cutters are to be actuated by the gearing or remain at rest.

A tongue or draft-pole, H , is rigidly bolted at its heel to the flanged or socketed upper side of a forwardly-projecting arm or narrow front portion, h , of the main frame C .

The tendency of the main frame to rock or tilt forward on the axle and cause the stiff tongue to bear too heavily upon the necks of the horses is, in a measure, counteracted by the weight of the driver in his seat in rear of the axle, as usual.

The finger-beam I , the cutter-bar, the cutters, and the guards of the cutting apparatus are of the commonly-employed kind.

A shoe, J , similar in all respects, except as otherwise explained, to shoes of well-known construction, is connected with a hinged two-part coupling-frame or double brace-bar in the following way: The shoe of ordinary form is provided with upright front and rear lugs, K K' , the lug K being near the point of the shoe, and the lug K' at the heel. The front lug is hollow or slotted, and is open at its rear from its base to near its top, to form a way in which a roller plays, as hereinafter explained. This lug is shown as of a bow-like or arched shape, and as closed at front at its base and for about half its height. The slot at the rear extends from the base upward to the arched or curved and closed top. The inner ends of the crossed arms or members L L' of the double brace or two-part coupling-frame are hinged or pin-jointed by a rod, M , to the under side of the main frame C . This rod is beneath and in line with the tongue, and at the side of and parallel with the crank-shaft G .

The pivot-rod M passes through down-hanging forked lugs or two-armed pendent brackets m m' .

The bottom diagonal bar, L' , of the brace has an eye or loop formed at its inner end to receive the rod M , and fits between the arms of the rear lug, m' . The upper bar, L , of the brace is correspondingly formed at its inner end to receive the pivot-rod, and fits in the arms of

the front bracket, m , beneath the front narrow part or projection, h , of the frame. The two members of the brace where they cross each other are bolted or otherwise secured together, as usual.

The bars L L' of the brace are hinged or pin-jointed to the shoe at their downwardly-bent outer ends by a pin or rod, N . A roller, n , on the front of this rod plays up and down in the guideway or slot in the lug K . (See Fig. 3.) A swivel-connection or double joint is made between the bar L of the brace and the heel-lug K' . The rod N passes through an eye or opening in the head of a turning rod or swivel-bolt, N' , removably secured by a nut or otherwise in the rear lug, K' , of the shoe.

By this construction the finger-beam may be rocked vertically in two planes, so as to tilt the guards and allow the outer end of the beam to rise or fall.

The cutting apparatus is left free to conform to the surface of the ground over which it passes without necessarily affecting the hinged brace or rocking it on the pivot M .

As the points of the guard-fingers move upward to glide over obstructions, the roller n moves downward in its slot or guideway in the front lug of the shoe, and when their points are rocked downward the roller ascends.

The rocking of the guards is limited by the length of the slot or degree of play allowed the roller in its lug.

To enable the driver to control the rocking of the finger-beam and limit the downward movement of the outer ends of the guards, and yet leave the cutting apparatus free to conform to the undulations of the ground independently of the brace, and to pass slight obstructions by rocking to move upward the points of the guards, I mount a rocking lever, O , upon the brace near the shoe, provide it with a detent, and connect it with the front of the shoe by a flexible connection. In this way the finger-beam may be rocked transversely to any desired extent, within certain limits, to elevate the points of the guards and hold them so as to be incapable of descending, and yet leave them free to rock upward.

The lever O is shown as mounted upon a bracket or post, O' , provided with a rack or series of notches, p , to engage a detent, p' , operated by the handle P in a well-known way. The lever-supporting and detent bracket O' is mounted on the brace-bar L' , near its outer end, so as to bring the short arm P' of the lever over and quite close to the front lug, K , of the shoe J .

A chain or other flexible connection is secured at one end to the top of the shoe-lug K and at the other to the lever. The lever extends diagonally backward toward the driver's seat, and when depressed lies over and parallel, or nearly so, with the bar L' of the compound brace or two-part coupling-frame.

To enable the driver to elevate the cutting apparatus first at the heel and then bodily, a

lifting-lever, Q, is mounted on the frame, at one side thereof, and so as to extend upward near to the driver's seat. The lever is pivoted at its lower end between lugs, or in a slotted or two-armed bracket on the frame near the bearing D' for the axle. The lever is slotted longitudinally for a portion of its length from its heel or lower end upward. A curved bar or bent link, Q', is pivoted at its rear end in the lever-slot, near its top. The outer or free end of the link projects downwardly from the elbow or central bend, and is joined by a chain, q, or any suitable connection, with the hinged coupling frame or brace. The chain passes from the link end to the bar L' of the brace, near its junction with the bar L. The chain q may be adjusted so as to connect with the brace nearer to or farther from its inner end, so as to increase or lessen the force required to lift the cutting apparatus, to suit the strength of the driver. Holes are provided in the bar L' for this adjustment. The closer to the pivot-rod M the connection is made the quicker the cutting apparatus may be elevated, and the greater the power required to operate the lever.

The link Q' may be adjusted up or down in the slot in the lever, instead of adjusting the chain, and answer the same purpose.

The lifting-chain passes from the link over a pulley, q', on its way to the brace. The bracket or lugs r, in which the shaft of this pulley is mounted, are preferably made shorter than the arms r', in which the lever is fulcrumed.

By the employment of the above-described devices I am enabled to dispense with the spring-detents, catches, &c., usually employed to lock the lifting-lever to hold up the cutting apparatus.

It will be seen that when the lever is thrown back far enough to bring the ends of the link Q' in line with or below the level of the lever-fulcrum, strain on the chain will not elevate the lever; and by locating the roller q' so low as to bring its surface over which the chain passes below the level of the lever-fulcrum the weight of the cutting apparatus keeps the link in proper position (when the lever is depressed to the proper extent) to prevent any possibility of accidentally elevating the lever, as by the jolting of the machine, and guards against the premature lowering of the finger-beam to its working position. The link, when the lever is thrown back, enters the slot therein, as will readily be understood from an inspection of the drawings.

The first upward movement, when the lever Q is operated, lifts the shoe or heel end only of the cutting apparatus, while continued strain on the lever causes the projection k, or the top of the lug K', to strike the under side of the bar L of the brace, and dog the heel of the beam, so as to cause the cutting apparatus to ascend at its outer end and bodily.

When the lever Q is thrown back or adjusted to its locking position for holding the cutting

apparatus elevated, as when moving from field to field, it will be seen that a very strong, inexpensive, and durable connection is made between the main frame and the compound brace-bar or coupling-frame intermediate its hinged attachment to the frame and the shoe.

There are no spring-pawls or detents, racks, &c., to wear, break, or get out of order, and to require the driver's attention and confuse him. An upward pull unlocks the lever, and a backward pull and downward thrust lock it. As the draft of the team comes upon the brace and cutting apparatus, as hereinafter will be explained, it is important to have the lifting and locking devices very strong, and to adapt them to be operated without requiring an undue exertion on the part of the driver.

To lessen side draft, and to reduce the strain on the brace-hinge by the drag or backward pressure on the cutting apparatus, I mount upon the stiff tongue H a vertically-rocking support or carrier, R, for a double-tree plate or holder, R', and connect these parts with the hinged brace L L' by a flexible connection, R². The double-tree holder support or carrier is composed of a loop-like rod, properly bent or shaped to pass around the tongue. It is attached to the tongue, upon its under side, by a suitable bearing plate or bracket, S, bolted or otherwise firmly secured in place, so as to allow the loop-support to rock vertically, but prevent its movement lengthwise of or along the tongue.

The double-tree is pivoted in the socket in the plate or holder by a bolt, S¹, which may be adjusted in one or another of a series of two or more holes, r², through both plates or the top and bottom portions of the holder. The double-tree is adjusted to suit the character of the crop or the length of the finger-beam, so that the draft of the team may be caused to exert a greater or less tendency to lift the cutting apparatus, and the forward pull on the brace be lessened or increased.

The links R² (or it may be any suitable flexible connection) couple the top bar L of the brace with the rocking support R on the inside of the tongue, or that side next the cutting apparatus.

An arm, or the inwardly-projecting end S², of the loop-shaped rod forming the support or holder, serves to attach the forward end of the draft-connection to the support. The draft-connection extends backward to the brace, diagonally downward and inward or toward the shoe. A single hole only is shown in the brace-bar, for attaching it to the rear end of the draft-connection; but obviously several holes may be made in the brace, so as to adjust the draft to increase or diminish the pull on the brace and the tendency to reduce the weight or relieve the pressure of the cutting apparatus on the ground.

The double-tree holder is pivoted upon the carrier R over the tongue, as clearly shown by the drawings, that it may turn or rock verti-

cally independently of the carrier for an obvious purpose.

By connecting the draft-links with the brace, in or nearly in line with the link Q' and chain q of the lever for lifting and locking the cutting apparatus in its elevated position, it will be seen that strain on the brace and its hinges in transporting the machine is considerably diminished.

By mounting the guard-rocking lever well out upon the hinged coupling frame or bar L' of the compound brace, not only is ample room left for the attachment and sidewise adjustment of the draft-connection R^2 between the post O' and the tongue, but a more direct lift or more nearly vertical pull upon the front of the shoe is attained than would be practicable were the lever mounted closer to the tongue and the inner or hinged end of the brace.

To completely protect the crank or wrist-pin of the crank-shaft, and prevent it from being clogged by dirt and the winding of grass about it, as well as to prevent loss of oil, and insure a thorough lubrication of the pin and the pitman-box or connection between the wrist-pin and pitman, I construct the parts and make the connections in the following way: The wrist-pin T is secured to the crank-wheel G^2 (see particularly Figs. 4 and 5) by securing its tenon or reduced end t in a mortise or opening in the crank-wheel by striking up or heading the pin at the back or inner face of the wheel, with the shoulder or inner end of the enlarged and regularly-formed main part of the pin against or close up to the wheel. The outer end of the wrist-pin is reduced or tenoned, and a screw-thread is cut upon it. A T-shaped pitman-box or two-armed coupling-sleeve, U U^1 , is connected to the wrist-pin by its tubular end or sleeve-bearing U , which is made open at both ends, and has an external screw-thread upon its outer end. The sleeve is slipped in place upon the wrist-pin, and snugly, but loosely, envelops it from end to end of its main or enlarged portion. The inner end of the wrist-enveloping sleeve projects onto and fits snugly in a seat or annular socket, t' , on the crank-wheel, concentric with the wrist-pin. The sleeve abuts at its inner end against the crank-wheel, and is free to turn in the socket t' . A nut, T' , on the threaded outer end of the crank-pin T , serves to secure the box-sleeve U in proper position. The nut overlaps or bears at its inner face against or close to the outer end of the enveloping-sleeve. In this way the wrist-pin, if loose in the crank-wheel, is drawn to its seat, and a close but sufficiently-loose connection to admit of the turning of the sleeve on the pin is attained, and loss of oil at either end of the sleeve is prevented.

An oil-chamber, V , in the arm or sleeve U^1 of the box, communicates, by a small opening, with an annular recess, v , in the sleeve U , around the wrist-pin. A screw-cap, U^2 , upon the outer end of the sleeve U , covers the nut

T' , and completely protects the wrist-pin, as well as serves as an additional precaution against the waste of the lubricant. An internal screw-thread in the outer end of the arm or sleeve U^1 of the pitman-box serves to connect the threaded end v' of the pitman V^1 with the box. A nut, V^2 , completes the connection. An opening in the top of the oil-chamber is provided to supply the oil and insure its feed to the lubricating groove or recess v around the wrist-pin. The end v' of the pitman serves as a plug to close the end of the sleeve U^1 and form one side of the oil-reservoir, and prevents escape of the oil by way of the sleeve U^1 , in which the reservoir is formed.

The pitman-box proper, it should be observed, is made of a single piece, the two arms or sleeves U U^1 being formed together.

The crank-shaft G turns in suitable bearings W W' in the frame, parallel with, but not concentric with, the pivot or hinges of the coupling frame or brace of the cutting apparatus. Owing to this relative arrangement of the crank-shank and the inner hinged ends of the brace there is a slight endwise movement (a pull or thrust) on the pitman in elevating and lowering the cutting apparatus; but this movement of the pitman is no disadvantage. It does not cramp or bind the cutters nor injuriously strain the machine. The front bearing, W' , in the main frame for the crank-shaft projects downwardly and outwardly from the outside (that side opposite to the side from which the cutting apparatus projects) of the front narrower part or arm, h , of the frame. Ample room is left upon the inside of the frame to accommodate the brace, the guard-rocking lever, and the chain of the lifting and locking lever, and to allow of all the required movements being given the cutting apparatus, as well as leaving room for the draft attachment.

The pawls a of each of the backing-ratchets B^1 B^2 (see Figs. 9, 10, and 11) are respectively fitted at their inner ends, so as rock in sockets in a spider, or in the outer ends of radiating arms secured to the inner face of a disk, b^1 , on the driving-wheel hub, as usual. The internally-ratcheted inclosing hub or wheel b^2 , fast on the axle, fits around the disk b^1 , as is well understood.

As the pawls are all alike, but one need be described.

The inner side of the pawl, or that away from the driving-wheel hub and next the ratchet-hub, is plane surfaced or smoothly and regularly formed, so as to prevent irregular wear by the frictional contact between the pawl and ratchet-hub when the machine is backing.

This side of the pawl, as compared with the opposite side, is broad, and presents a large wearing-surface, and gives strength to the pawl. That side or face of the pawl next the disk b^1 , which, to distinguish it from the broad regular face and facilitate description, I term the "outside," is irregularly formed, having a

narrow flange or rib, a^1 . This flange or rib is widened out at the outer end of the pawl to form a broad nose or wearing-point to engage the ratchet and resist wear. At the inner or heel end of the pawl the rib is curved to form a partially-open recess or socket. The socket is open at the outer end or on the outer side or face of the pawl and at one side, as clearly shown in Figs. 10 and 11.

The pawl-spring a^2 is secured in place and its coil inclosed in the socket by a headed bolt or pin, b^3 , around which the spring is coiled before inserting it in the pawl-recess. When the pin is placed in the socket and screwed or riveted in place the ends of the spring project out at the side opening or front of the socket, one end being fast in a hole in a shoulder or lug, a^3 , on the rib a^1 . The free end of the spring bears upon the spider or fixed hub b of the ratcheted pawl-receiving arms, and performs the usual functions.

By the above-described construction the spring may be readily and securely fastened in place, and ample room left for the expansion of its coil.

I do not broadly claim a lifting and locking lever having a slot in which a link connected with the lifting-chain plays, nor a forked or two-part hinged brace or coupling frame. Neither do I claim, broadly, the combination, with a hinged brace or coupling frame, of a shoe hinged thereto, and having a double joint or swivel connection at its heel and playing vertically at the front end.

I do not claim a vertically-rocking double-tree plate or holder having a draft chain or attachment; nor, broadly, the combination of such a holder and draft attachment with the cutting apparatus and a coupling-frame or hinged connection with the main frame.

I claim as my own invention—

1. The combination of the shoe, the swivel-bolt on its rear lug, the vertically-slotted front lug, the two-part coupling-frame, the connecting-bolt passing through the lugs of the coupling-frame and of the shoe, and the roller on the connecting-bolt playing in the slot of the front lug of the shoe, these members being constructed and operating substantially as set forth.

2. The combination, substantially as hereinbefore set forth, of the main frame, the doubly-hinged brace or coupling-frame, the cutting apparatus, the shoe provided with front and rear lugs, the double-joint or swiveling connection between the coupling-frame and the rear lug on the shoe, and the roller playing in a slot or way in the front lug of the shoe and carried by the coupling-frame, and partaking of its vertical movements.

3. The combination, substantially as hereinbefore set forth, of the main frame, the doubly-hinged brace or coupling-frame, the shoe, the cutting apparatus, the double-joint or swiveling connection between the rear lug on the shoe and the coupling-frame, the ver-

tically-adjustable roller and slot connection between the coupling-frame and the front lug on the shoe, and the rocking lever mounted upon the coupling-frame toward its outer end near the shoe, and flexibly connected with the front lug thereon.

4. The combination, substantially as hereinbefore set forth, of the main frame, the stiff or rigid tongue, the two-part brace or coupling-frame hinged to the main frame beneath the tongue and projecting in advance of the inner driving-wheel, the shoe, the cutting apparatus, the slotted lug near the point of the shoe, the heel-lug on the shoe, the turning rod or bolt in said heel-lug, the pivot-pin passing through said rod and the coupling-frame, and the roller carried by the front end of said pin and playing in the slot of the front lug on the shoe as the guards rock.

5. The combination of the main frame, the slotted lifting-lever, its bent or elbow link, the lifting-chain secured at one end thereto, the roller over which it passes, and the hinged brace or coupling-frame to which the chain is attached at its outer end, these members being constructed and operating substantially as hereinbefore set forth, whereby the cutting apparatus may be elevated and the lever locked by the strain on the lifting-chain.

6. The combination of the main frame having the narrow projection or arm h at front, the tongue rigidly secured to said arm, the brace or coupling-frame hinged to the main frame at two points, one beneath the arm thereof and the other near the axle, and the lifting-lever flexibly connected with the coupling-frame inside the driving-wheel at the side of the narrow portion or front arm of the frame and near the heel of the tongue, substantially as hereinbefore set forth, whereby provision is made for the attachment of the draft-connection and to accommodate the rocking lever, as described.

7. The combination of the main frame having the narrow front portion or arm h , the hinged brace or coupling-frame, the hinged cutting apparatus, the stiff or rigid tongue, the vertically-rocking double-tree plate or holder, and the flexible draft-connection between said holder and the hinged brace, these members being constructed and operating substantially as hereinbefore set forth.

8. The combination of the crank-wheel, the wrist-pin, the two-armed or double-sleeved pitman-box, the nut on the end of the wrist-pin overlapping the end of the wrist-pin-enveloping sleeve of the pitman-box, and the cap on the end of said sleeve, substantially as and for the purpose set forth.

9. The T-shaped pitman-box or two-armed coupling-sleeve $U U^1$, made in a single piece, having the annular groove or lubricating-recess in one sleeve and the communicating oil-chamber in the other, the one sleeve being provided with a screw-thread to secure the pitman, and the other with the external screw-

thread, by which is attached the screw-cap to inclose and protect the outer end of the wrist-pin and its nut, substantially as hereinbefore set forth.

10. The combination, substantially as hereinbefore set forth, of the crank-shaft wheel, the seat or socket thereon, the wrist-pin, the two-armed pitman-box or coupling-sleeve, the nut on the outer end of the wrist-pin, the cap on the outer end of the sleeve of the pitman-

box which surrounds the wrist-pin, and the pitman connected with the other sleeve of the box, whereby the working parts are protected and loss of oil is prevented.

In testimony whereof I have hereunto subscribed my name.

WILLIAM R. BAKER.

Witnesses:

JOHN V. A. HASBROOK,
F. H. MATTHEWS.