

W. N. Whiteley Harvester-Rake

N^o 81045

Patented Aug. 11, 1868.

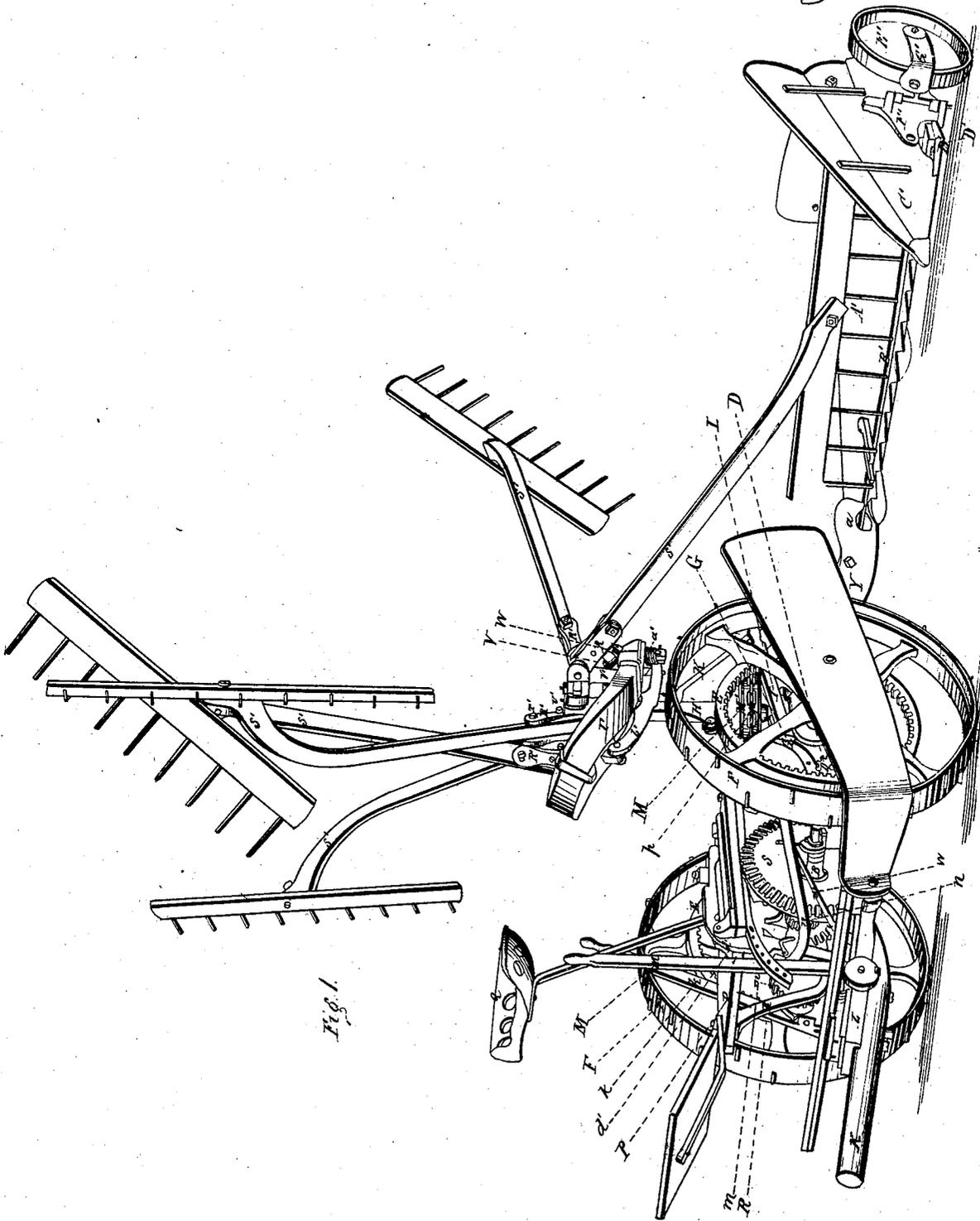


Fig. 1

Witnesses

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T. Brown

Inventor

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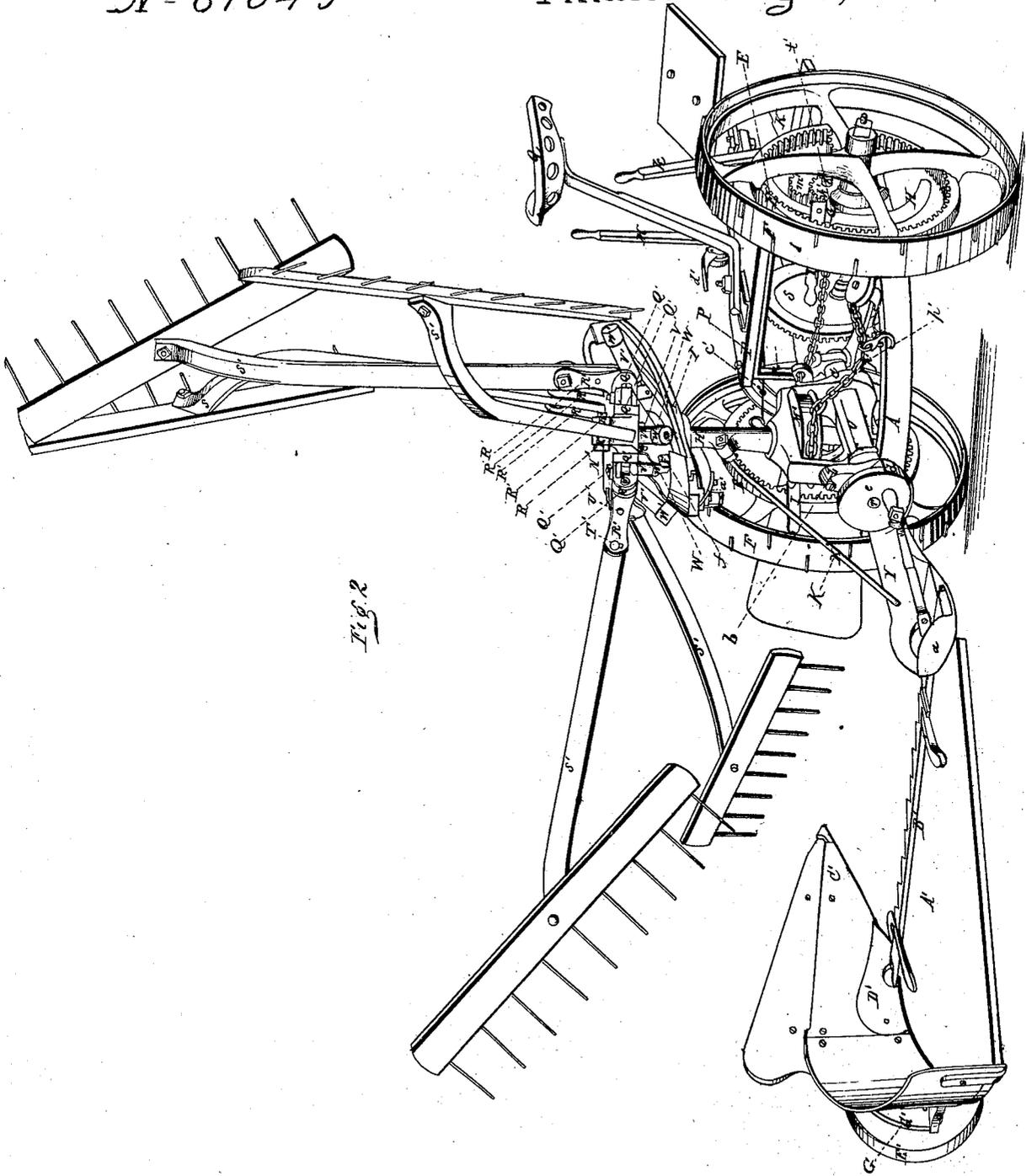


Fig. 2

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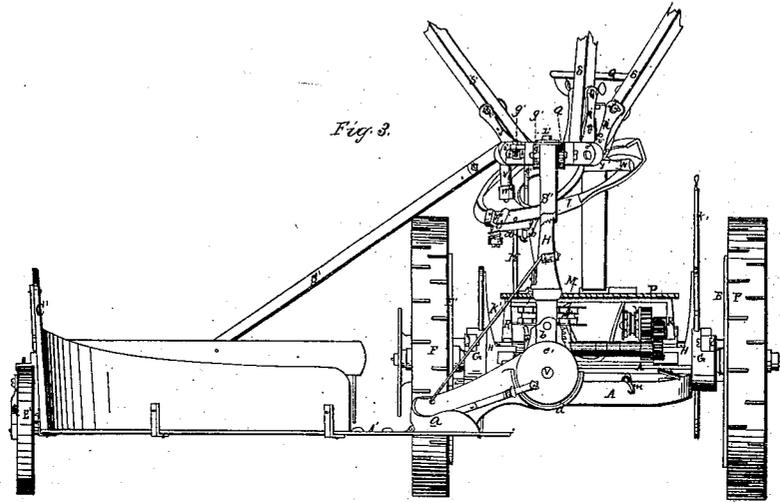


Fig. 3.

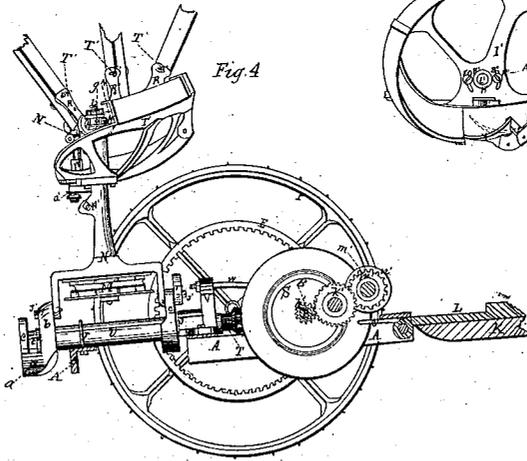


Fig. 4.

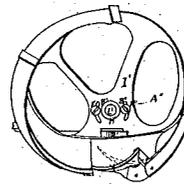


Fig. 9.

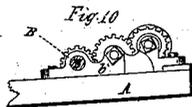


Fig. 10.

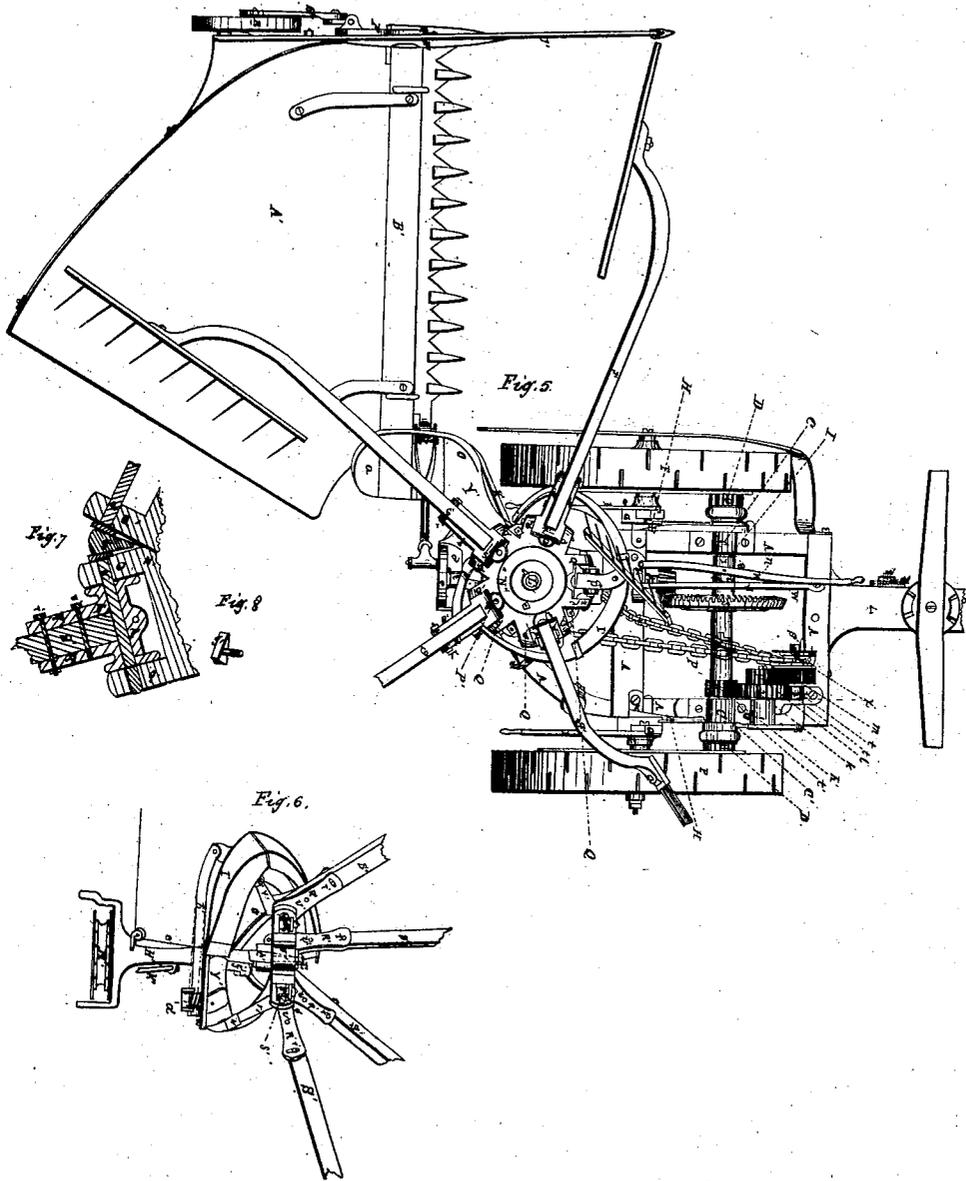
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UNITED STATES PATENT OFFICE.

WILLIAM N. WHITELEY, OF SPRINGFIELD, OHIO.

IMPROVEMENT IN HARVESTER-RAKES.

Specification forming part of Letters Patent No. 81,045, dated August 11, 1868.

To all whom it may concern:

Be it known that I, WILLIAM N. WHITELEY, of Springfield, in the county of Clarke and State of Ohio, have invented a new and useful Improvement in Harvesters; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of my machine in working position as a reaper, taken from the front. Fig. 2 is a perspective view of the same, taken from the rear. Fig. 3 is a rear elevation. Fig. 4 is a sectional side elevation taken on line *xx* of Fig. 5. Fig. 5 is a plan view of the same, with the platform removed so as to exhibit the gearing. Fig. 6 is a side elevation of the rake-guide, &c. Fig. 7 is a horizontal section through a part of the rake-shaft, showing the manner of retaining the joint-bolts in place. Fig. 8 is a perspective view of the block which is employed to retain the joint-bolts in place.

My invention relates to that class of harvesters known as "reaping-machines;" and it consists in the manner of mounting and adjusting the rake-stand upon the coupling-arm; in the arrangement and construction of the gearing; in the manner of retaining the joint-bolts in place, &c.

That others may understand the construction and operation of my invention, I will particularly describe it.

A is the main frame, composed of bars of angle-iron form, the outer side piece of which is extended backward, and curved around toward the cutting apparatus, as particularly shown in Fig. 3.

The pinion-shaft B is mounted in boxes C C, secured to the side pieces of the main frame in the usual way, and the pinions D D gear with the internal spur-wheels E E, which form parts of the driving and supporting wheels F F. The axles of the wheels F F project from the rear ends of the sector-plates G G, which are hung upon bearings the centers of which are coincident with the axis of the pinion-shaft B, so that, as the axles of said wheels F are raised or lowered in respect to the pinion-shaft, the mesh of the gears D and E will not be changed.

The rear ends of the sector-plates G G are

retained in proper line, and are supported by the curved standards H H, which are bolted at their lower ends to the side pieces of the main frame.

The levers I I, secured to the sector-plates G, project backward to a convenient position, and enable the attendant to easily adjust the height of the main frame in respect to the axis of the main wheel. The pins J J, inserted through holes in the sector-plate and standard, hold the sector-plate in the desired position upon said standards, so as to elevate the main frame a proper distance from the ground.

The tongue K is bolted to the draft-plate L, which is jointed to the front bar of the main frame, by a long bolt passing through corresponding lugs upon the draft-plate and front bar of the frame. The lever M is attached to the draft-plate by an adjustable serrated joint, and by pulling or pushing the top of said lever the driver can depress or elevate the front end of the main frame at will.

While mowing, the tongue is flexible, so that the cutting apparatus may conform to the surface of the ground; but during transportation from place to place, or while being used as a reaper, it is necessary that the tongue should be rigid, and I therefore provide the arm O, which is bolted fast to the platform P, and projects forward by the side of the lever M.

The arm O is provided with a series of holes, and the lever M has a projecting pin, N, which may engage in any one of said holes, and hold the tongue and frame in any fixed relative position.

While mowing, the front end of the main frame will be elevated so much that the pin N will not come in contact with the arm O, and at any time, when it is desired to disengage the pin N from one of the holes in the arm O, it is only necessary to press the lever sidewise slightly.

The platform P, upon which is mounted the driver's seat Q, is supported by legs R at a height above the main frame sufficient to accommodate the large gear-wheel S beneath it.

The crank-shaft T, which is driven by the bevel-wheel S, has its bearings in the long pipe-box U, which is secured to the rear cross-bar of the main frame by bolts, and to the curved side bar by a stout strap or staple, *r*,

which passes over the box and down on either side through the rear bar of the frame, and is secured by a screw-nut on each of its ends.

This pipe-box U is cast with the lug V projecting upward from its forward end, for attachment of the draw-rod W, which connects the upper end of said lug and the front bar of the main frame, as shown, and materially strengthens the frame, and transmits the draft-strain directly to the coupling-arm and cutting apparatus. The pipe-box U, being thus connected to the bars A A, forms a part of the main frame, at the same time that it contains the bearings and protects the crank-shaft from dirt or injury. It may be cast in a single piece, cored out through its central part, and bored at the ends to fit the shaft. The pipe-box is turned so as to form on its outer surface, at two points, bearings for the coupling-arm Y, so that while the machine is in operation the cutting apparatus may rise or fall, moving upon a center coincident with the center of the crank-shaft. The pipe-box U not only secures the shaft T from dirt and other extraneous clogging matter, but it protects it from accidental injuries, and the strain of binding in its bearings, to which all other arrangements must be liable.

The coupling-arm Y is cast solid with the inner shoe *a*, and the inner end is cast with the branches *b c*, through which holes are accurately bored and fitted to the cylindrical portion of the pipe-box V, as shown in Figs. 2 and 4, thus securing separate bearings for the coupling-arm joint each end of the pipe-box, and enabling it to withstand the side strain of the cutting apparatus without other bracing than its bearings upon the pipe-box.

The lower part of the branch *b* is provided with the flange *d* projecting backward beneath the crank-wheel *e*, so as to protect said wheel from collision with any object which may be upon the ground over which the machine may be passing.

The crank-wheel *e* is provided with a hub, *t*, which projects forward on the rear end of the crank-shaft T. This hub is secured in place by a key or pin passing through both hub and shaft, and at its forward end it is provided with a flange or shoulder, *u*, larger in diameter than the end of the pipe-box U, with which it is in close contiguity. The pipe-box, near its forward end and just in rear of the lug V, has a corresponding shoulder, *v*, and between the shoulders *u* upon the crank-shaft and *v* upon the pipe-box the coupling-arm exactly fits, and the shoulder *u* retains it in place.

If it should be required to remove the coupling-arm, it would be necessary to remove the strap *r*, loosen the bolts at the forward end of the pipe-box, and remove the crank-wheel *e*, after which the coupling-arm could be slipped on or off its bearings upon the pipe-box.

The clutch-lever *n*, at the will of the operator, throws the operative mechanism out of gear with the main wheels, and a small hook, *g*, pivoted to one of the front posts of

the platform P, serves to retain the lever *n* in the desired position to prevent an accidental disengagement of the mechanism. The main bevel-wheel S is loose upon the axle B, and is engaged or disengaged therewith by a sliding clutch operated by the lever *n*.

A' is the platform, attached to the rear edge of the finger B' by metal battens in the ordinary manner. A vertical divide-board, C', is secured to the outer shoe D' by screws or other sufficient means, and the forward point of said divide-board is set out sufficient to gather all the grain which stands inside of the line of the tread of the grain-wheel E'. The platform A' belongs to that class known as "quadrant-shaped," though, in reality, it is bounded on one side by a chord, and on the other by the radius of a circle drawn from the center of revolution of the rake and reel blades, and in area it corresponds to a sector of about one-sixth of a circle.

The grain-wheel E' is pivoted to the outer end of an arm, G', jointed at its other end to a plate, F', which is secured to the divide-board and shoe, so that said wheel may follow like a caster-wheel, and the arm G' is provided with an adjustable joint near its forward end, which permits the wheel E' to be set as desired, to give the machine a high or low cut.

The rake-stand is composed of a tubular post, H', and guide-frame I' bolted to its upper end. The post H' has lugs at its lower end, which are exactly fitted between the lugs *b c* of the coupling-arm Y, and it is attached to said coupling-arm by screws J' J', which pass through the lugs *b c* into the lugs of the post H'. The ends of the brace-rod K' pass through lugs or flanges on the shoe *a* and post H', and said rod connects said post with the inner shoe *a*, so as to hold them in the same relative position to each other, but permits the ready adjustment of the rake-stand in regard to its position, as inclined to or from the cutting apparatus, by means of the screw-nuts at the ends of the brace-rods, which renders it easy to change the effective length of said rod, and incline the rake-stand toward or from the shoe *a* and cutting apparatus, or hold it perpendicular thereto. The object of this adjustment is to enable the attendant to adjust the sweep of the reel or the rake to such a distance from the platform as may be desired.

The post H' is tubular, and forms a long box, with bearings at its ends for the shaft L', which communicates motion to the rake and reel. This shaft L' has at its lower end a chain or sprocket-wheel, M', by which it receives motion from the driving mechanism, and at its upper end a metallic head, N', provided with parallel pairs of projecting lugs Q', (see Fig. 5,) to receive the joint-bolts O' and rake-arm heads P', of which there may be any required number.

When the shaft L' revolves, the head N' and the attached rake and reel arms are caused to revolve also, and they pass over the platform in lines parallel thereto, but are raised up

in the air to a position more or less nearly vertical as they pass over the main frame, so as not to endanger or incommode the driver sitting upon his seat. This irregular movement of the rake is produced by the guideway *I'*, over which the reel and rake arm pass in their rotation around the shaft of the reel and rake.

The rake-arm head *P'* is made with two branches or arms, *R' R'*, between which the rake or reel arm *S'* is fitted, and secured by the bolts *T' U'*, Fig. 5, the latter of which is passed through the arm *S'*, near to its end, and acts as a pivot upon which the rake may be adjusted, while the bolt *T'* passes through a hole in the arm *S'*, and through slots in the branches *R'*, so as to permit a movement of the rake-arm, as above mentioned, and enable the attendant to fasten and securely hold to arms *S'* at the desired point of adjustment. This adjustment of the rake-arm *S'* is required to regulate properly the distance at which the rake or reel shall pass above the platform, and to adjust the reel or rake-blade so that it shall move over the platform in a plane parallel thereto.

The head *P'* is provided with a pendent stud, *V'*, at the lower end of which is a traveler-roller, *W'*, which traverses the surface of the guideway *I'*, and causes the path of the rake to conform to the inequalities thereof.

It is required to make the rake efficient at all times, that its periods of operation upon the grain should be variable and under the control of the attendant, as it frequently occurs that the standing grain is too thin to make a sufficient gavel during one revolution of the driving-wheels. I have therefore provided a switch, *Y'*, over which, when closed, the rollers *W'* are compelled to travel, so as to pass at such a distance above the platform as will not permit them to remove the cut grain therefrom; but when the switch is open, then the roller may pass along the guideway behind it, so as to permit the rake or reel blade to descend upon and remove the grain from the platform.

In this machine each of the reel-blades is represented as provided with teeth, so that either of said reel-blades may act as a rake, if permitted to descend upon the platform, by opening the switch *Y'*. It is necessary to place the switch *Y'* under control of the driver, so that he can cause it to open as often as required, and I therefore, by means of the spring *a'*, cause the switch to open automatically when released from the latch *b'*, which retains it when closed. One end of the spring *a'* acts against the lower end of the pin of the switch *Y'*, and the other end of the same spring acts against the free end of the latch *b'* to raise the same behind a small stop attached to the switch, which comes into position to engage with the latch *b'* when the switch is opened.

The latch *b'* is pivoted to the front part of the guide-frame, and a cord, *c'*, is attached to the middle portion of said latch, and thence extended to the treadle *d'* at the front end of

the platform, and convenient to the driver's foot, so that he can at any moment withdraw the latch and permit the switch to open.

If the condition of the grain will permit, the opening of the switch may be made automatic by the employment of a cam-lug, *e'*, attached to the shaft-head *N'*, and adjusted to come in contact with and push downward the lug *f'*, which projects upward from the latch *b'* for that purpose. The lug *e'* is made with a tang, which passes upward through a hole in the shaft-head *N'*, and is secured in place by a screw-nut at the top of the tang. This is for the purpose of easy removal or attachment.

If desired, the tang of the lug *e'* may pass through a slot in the head, and it can then be removed to one side to prevent contact with the lug *f'*, if so desired.

The joint-bolts *O'* pass through the lugs *Q* *Q*, and are placed so that the heads of two adjoining bolts are toward each other, and then both of said bolts may be retained in place by interposing the wedge-shaped stop *g'* between their heads. The stop *g'* has a tang fitted with a screw-nut at its end, and said tang passes through a hole in a flange or web which connects the adjoining lugs *Q* *Q*, and is secured in its place by the screw-nut at its top.

The hole through which the tang passes may be somewhat larger than said tang to permit a slight adjustment of the stop *g'* to make it touch both of the bolt-heads, which it is required to keep in place.

The rake-guide *I'* is made adjustable upon the head of the post *H'*, so that the position of the switch, &c., may be regulated to govern the stroke of the rake in reference to the cutting apparatus and platform; and this adjustability I can secure by passing the binding-bolts *A''* through the slots *B''*, or by equivalent means, so that the guide-frame may be moved partially around the head of the post *H'*, and secured at any desired point by tightening up the binding-bolts. (See Fig. 9.)

The driving-pinion *h'* is mounted on the main pinion-shaft *B*, and communicates motion to the train which drives the reel and rake. The hub of the pinion *h'* is formed into a sleeve, *j*, long enough to couple to the hub of the main bevel-wheel *S*, so that when the cutters are stopped by disconnecting the wheel *S* from the driving-axle by the clutch *i'*, the pinion *h'* will be thrown out of connection also, and the rake and reel will cease to revolve.

In order to give the proper velocity to the reel-blade, the intermediate pinions *k' v'* are interposed between the driver *h'* and its pinion *m'*. *v'* is smaller than *k'*, and the effect therefore is to reduce the speed of the pinion *m'*. The intermediate wheels *k'* and *v'* are cast together in a single piece, so as to increase their strength, give them a long, and therefore steady, bearing upon their journal, and facilitate the handling when it is necessary to remove them, as when the machine is to be converted into a mowing-machine.

Attached to the side of the pinion *m'* is a

sprocket-wheel, n' , cast in one solid piece with said pinion m' , for the same reasons that k' and l' are cast in a single piece. The chain p' passes over the sprocket-wheel n' and around the sprocket-wheel M' , so as to drive the rake, and, to conduct it properly from one wheel to the other, it passes through the guide r' attached to the lug c of the coupling-arm, and under the hook s' attached to the front bar of the machine.

It is of the first importance that the bearing of gear-wheels which mesh with each other should be secured always at exactly the same distance asunder, because a small variation in the distance will change the frictional surfaces of the wheels, and cause them to run badly, and with too much friction. I therefore cast a single piece, t' , of metal, which should be of the proper form and dimension to form the box for the outer end of the pinion-shaft B, and to receive the bearings of the wheels $k' l'$ and $m' n'$. The bearings or journals of those wheels are formed of steel or iron, turned true, with a shoulder and tang to be inserted through holes in the block t' , and secured therein with screw-nuts. The wheels $k' l'$ and $m' n'$ are retained in place on their journals by pins or keys inserted through the journal outside of said-wheels.

When the machine is to be fitted as a mower, the pins are withdrawn and the wheels $k' l'$ and $m' n'$ are removed from their studs, so as to be out of the way during the operation of mowing. I locate the gearing which immediately drives the rake at the outer forward corner of the machine, as shown, so that the chain p' , in its passage back to the sprocket-wheel M' , will pass entirely clear of the gear-wheel S and its connections.

The rake-stand is located at a considerable distance in front of the line of the cutter-bar, and the reel-arms are curved backward near their outer ends, so that the reel-blades will

meet and be parallel with the line of the cutting apparatus when the reel-arms project from the shaft L' in lines parallel with said cutting apparatus.

By placing the rake and reel stand at a distance in front of the line of the cutting apparatus, I am enabled to employ a shorter platform than would be possible with rake located as far or farther back than the line of the cutting apparatus.

Having described my invention, what I claim as new is—

1. Conducting the rake-stand to the coupling-arm by the pivot-bolts J' J' on a line parallel with and above the crank-shaft.

2. The adjusting-brace K', or its equivalent, connecting the rake-stand to the main shoe, substantially as set forth, so that the position of the rake-stand may be adjusted in reference to the plane of the cutting apparatus.

3. The supplemental gear-wheels $k' l' m'$ driven by the pinion h' on the main pinion-shaft, and arranged at the outer front corner of the platform, in connection with the chain p' and chain-wheels $M' n'$, to communicate motion to the reel and rake shaft.

4. The combination-box t , cast in one piece, to support the pivot-pins of the supplemental gears $k' l' m'$, as and for the purpose set forth.

5. The stop g' interposed between the heads of the joint-bolts $o' o'$, to retain them in place, substantially as set forth.

6. The tripper c' , constructed with a shank extending through the head, so as to be readily secured with a screw-nut, for the purpose of easy removal, as set forth.

7. An adjustable guide-frame, I', substantially as described, and for the purpose set forth.

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Witnesses:

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