No. 754,166. PATENTED MAR. 8, 1904.

G. L. ROBY.

HAY TEDDER.

APPLICATION FILED FEB. 28, 1901.

NO MODEL. 3 SHEETS—SHEET 1.

Fig. 1.

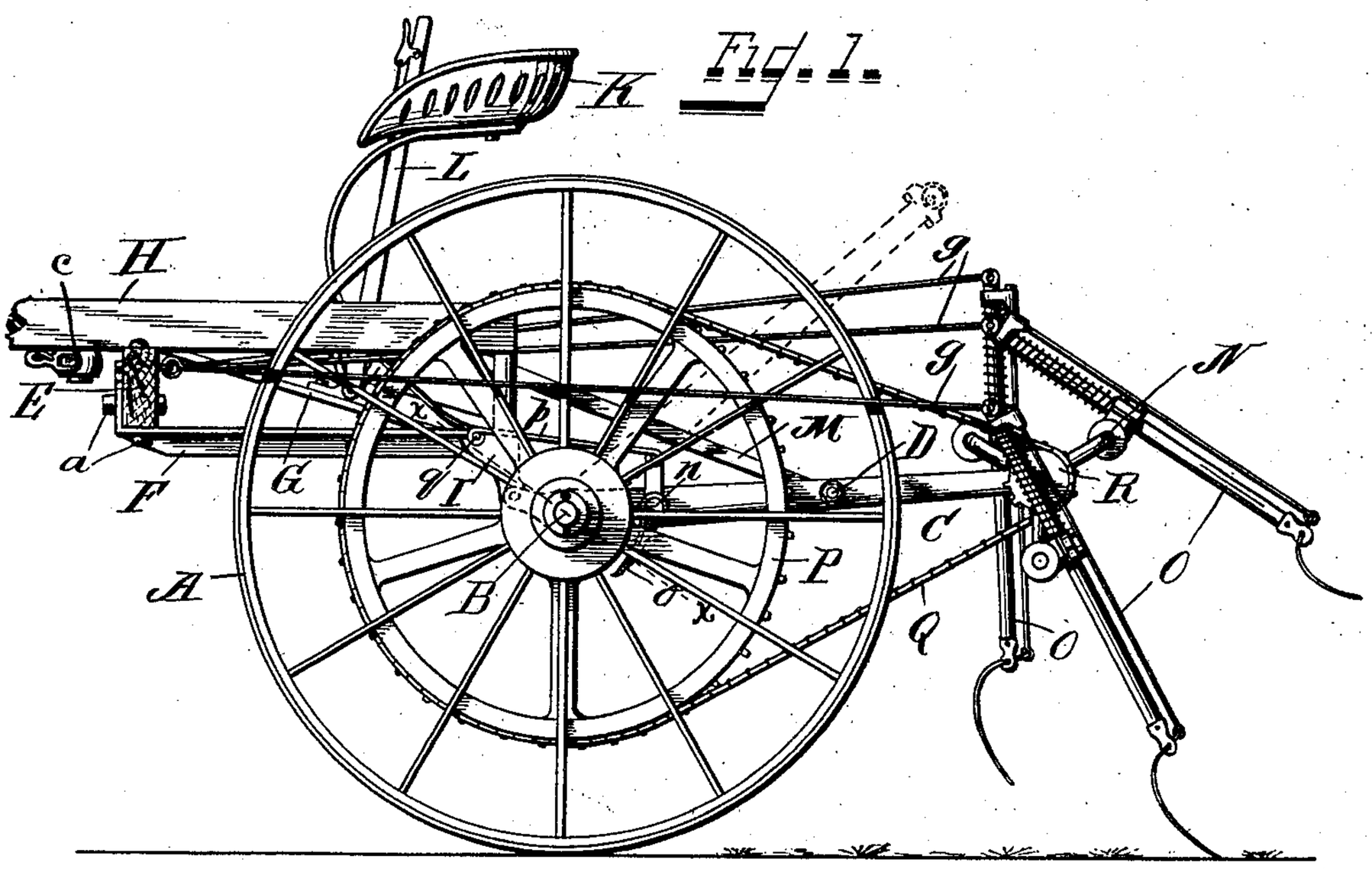

Fig. 2.

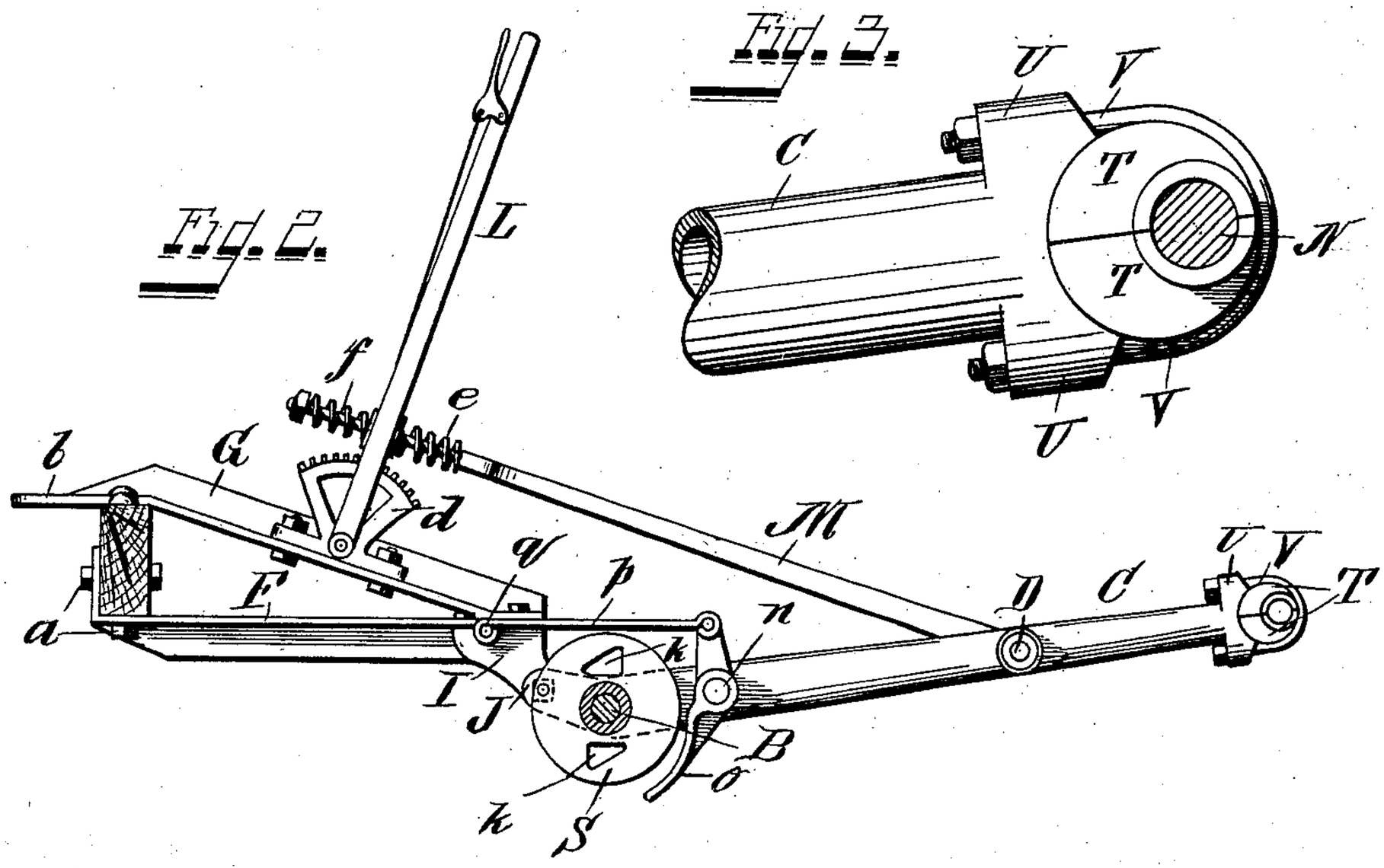

Fig. 3.

Witnesses.

Wm. J. Peck.

Edward Peck

Inventor.

George L. Roby

by Chas. M. Peck

his Attorney.

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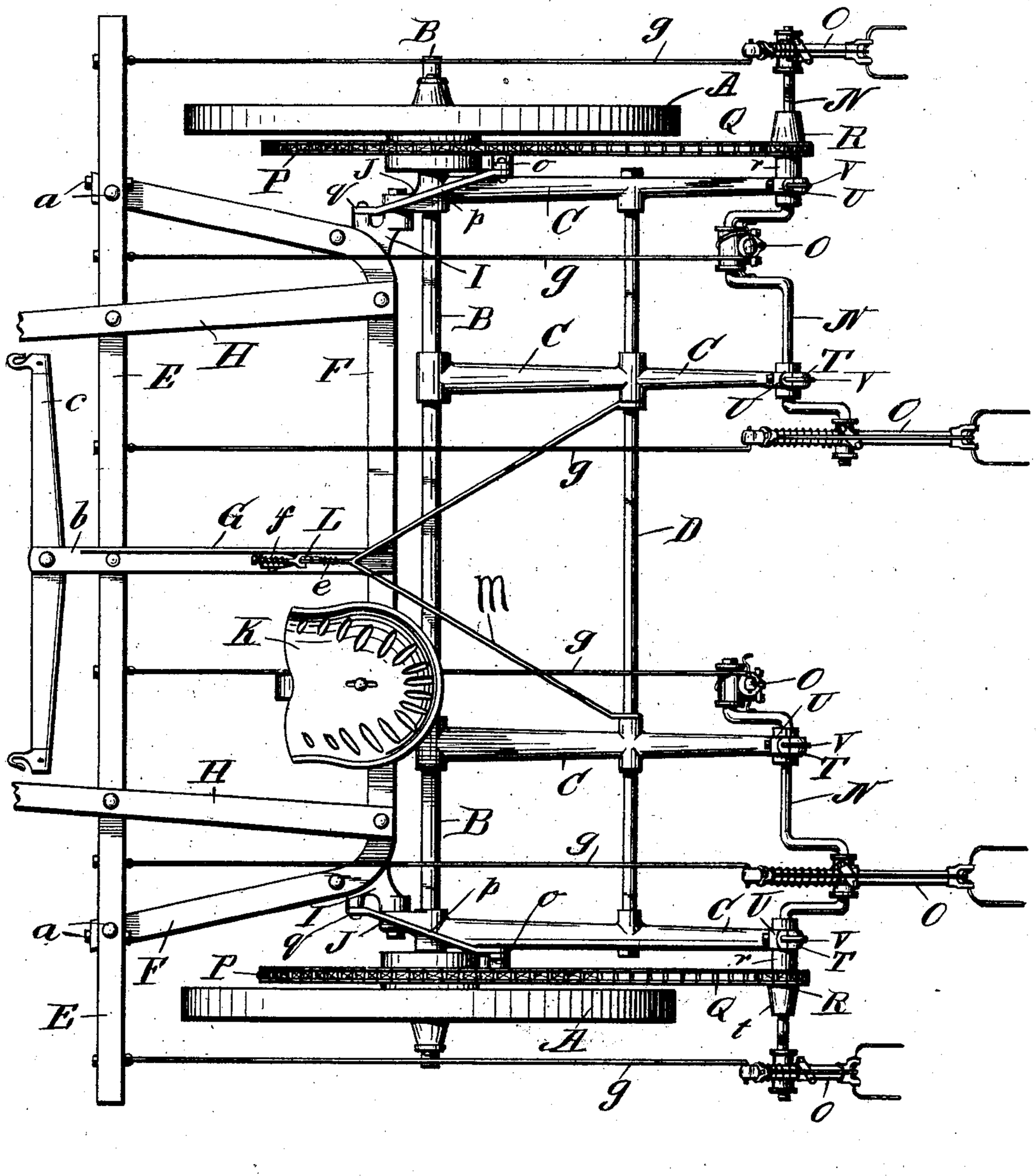
NO MODEL. 3 SHEETS—SHEET 2.

Fig. 4.



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NO MODEL. 3 SHEETS—SHEET 3.

Fig. 8.

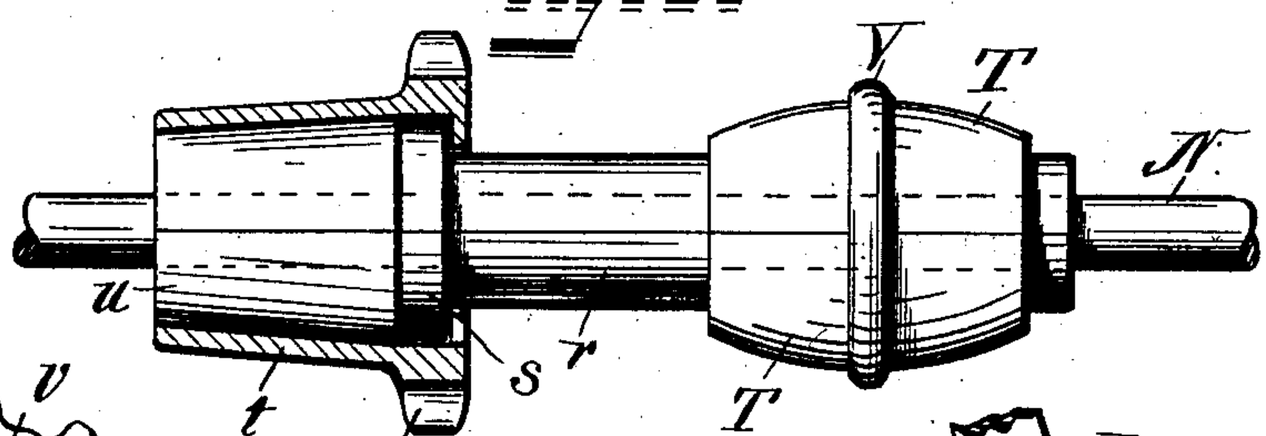


Fig. 9.

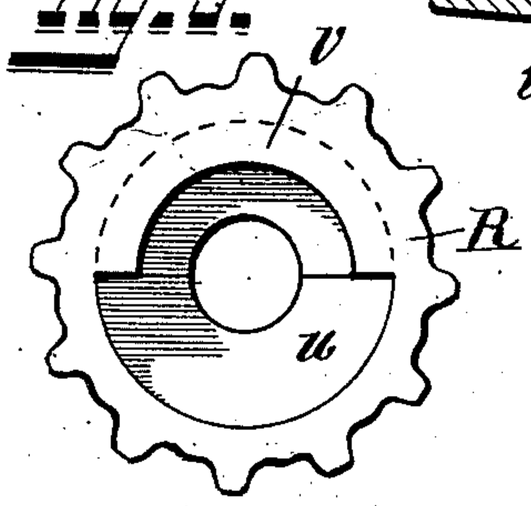


Fig. 6.

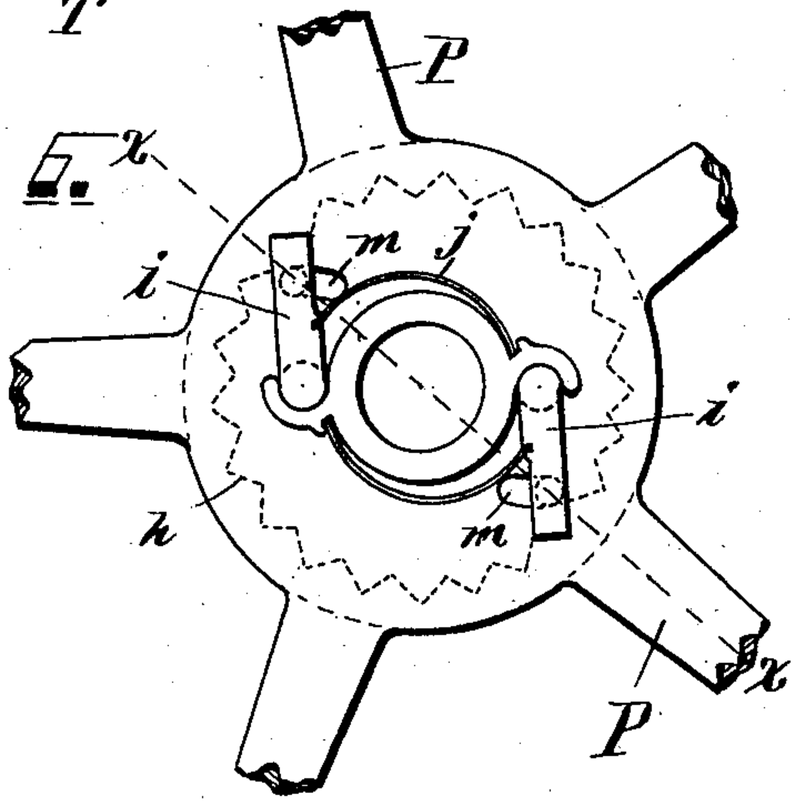


Fig. 7.

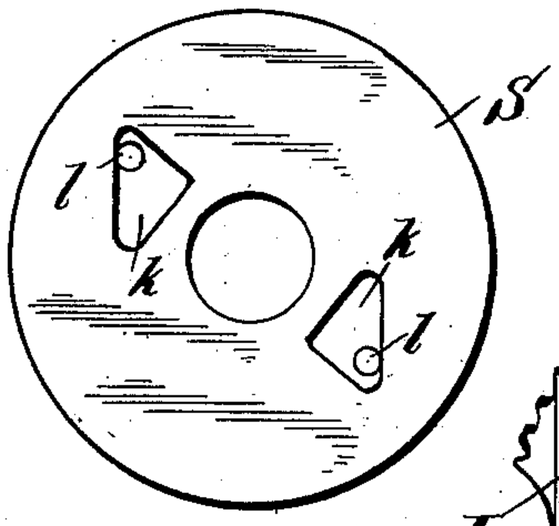


Fig. 5.

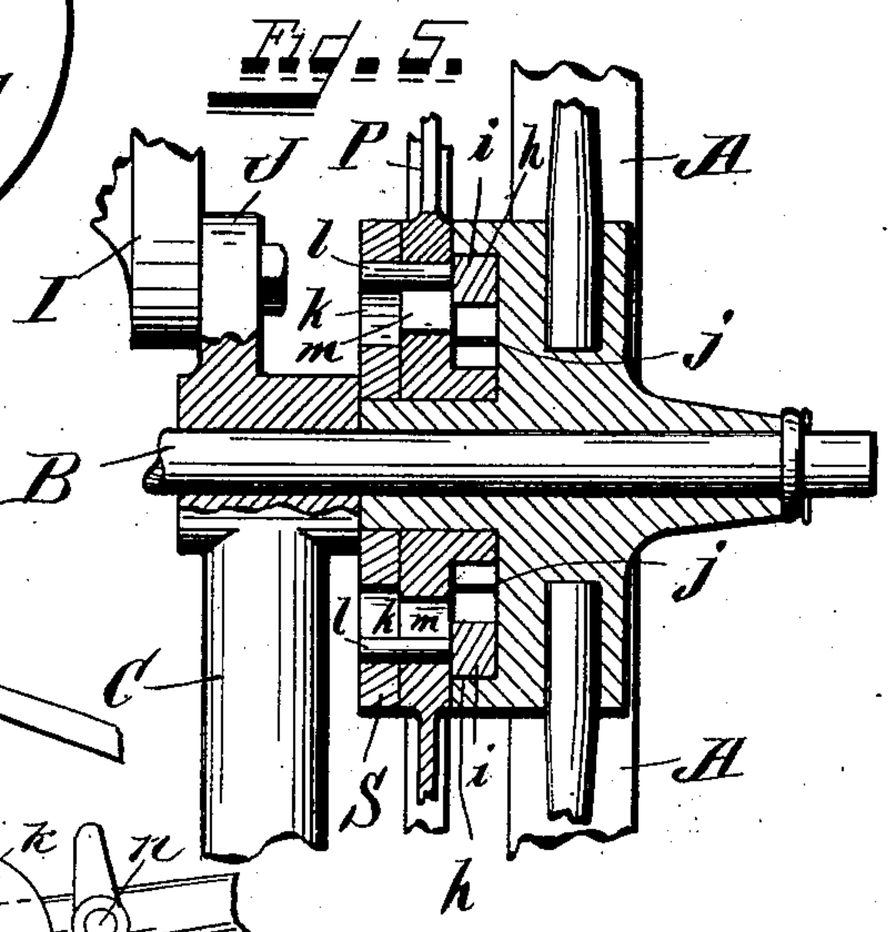
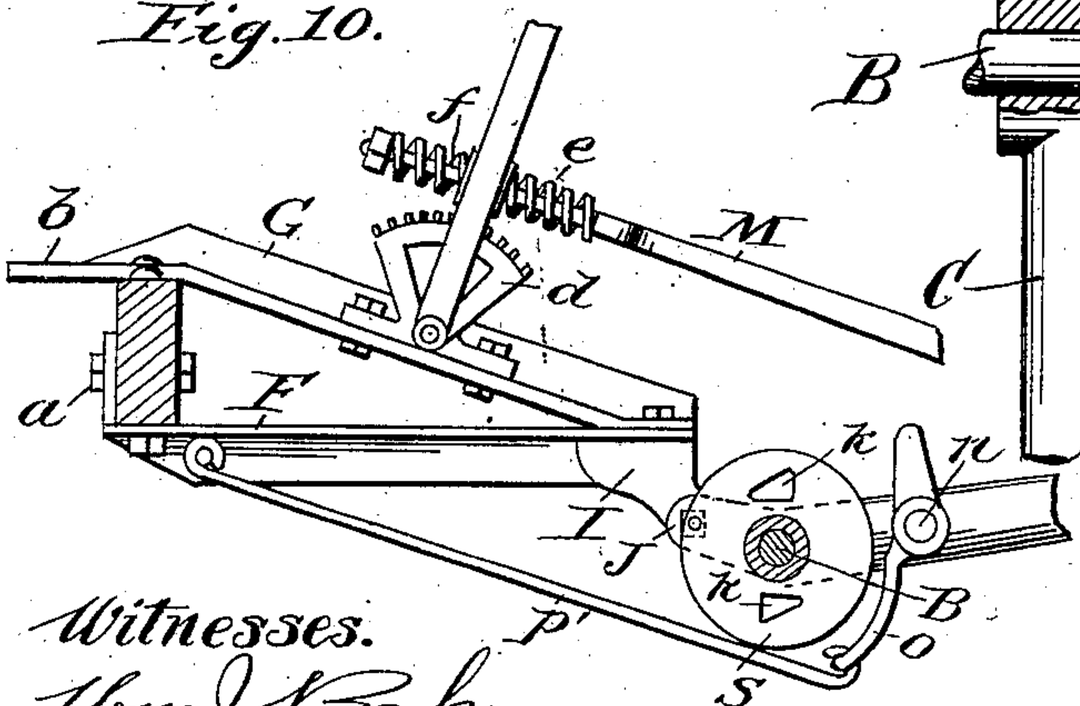


Fig. 10.



Witnesses.

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his Attorney.

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UNITED STATES PATENT OFFICE.

GEORGE L. ROBY, OF DAYTON, OHIO, ASSIGNOR TO THE STODDARD MANUFACTURING COMPANY, OF DAYTON, OHIO, A CORPORATION OF OHIO.

HAY-TEDDER.

SPECIFICATION forming part of Letters Patent No. 754,166, dated March 8, 1904.

Application filed February 28, 1901. Serial No. 49,247. (No model.)

To all whom it may concern:

Be it known that I, GEORGE L. ROBY, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Hay-Tedders, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to hay-tedders of the kicking-fork type; and its object is to simplify the construction and operation of machines of this class by reducing the number of parts therein and making those left perform the functions needed in a new and thoroughly efficient manner.

The novelty of my invention will be hereinafter more fully set forth, and specifically pointed out in the claims.

In the accompanying drawings, Figure 1, Sheet 1, is a side elevation of a hay-tedder embodying my invention. Fig. 2, Sheet 1, is an enlarged side elevation of the seat-frame and fork-frame and associated parts to illustrate the raising and lowering mechanisms and the automatic disengaging mechanism for the fork-shaft. Fig. 3, Sheet 1, is an enlarged side elevation in detail of the end of one of the fork-shaft arms and the eccentric journal-box secured therein. Fig. 4, Sheet 2, is a plan view of the tedder. Fig. 5, Sheet 3, is an enlarged sectional detail on the dotted line *x x* of Figs. 1 and 6. Fig. 6, Sheet 3, is an enlarged side elevation of the hub of one of the driving-sprockets looking from the outside and the ratchets in the hub of the adjacent supporting-wheel indicated by dotted lines. Fig. 7, Sheet 3, is an elevation of the pawl-disengaging cam-disk S of Fig. 5, showing the pins *l* in the cam-orifices. Fig. 8, Sheet 3, is a detail side elevation, partly in section, of the driving mechanism connected to the fork-shaft, including one of the journal-boxes attached thereto. Fig. 9, Sheet 3, is an end elevation of the sprocket-sleeve shown in Fig. 8 and looking to the left. Fig. 10, Sheet 3, is a broken side elevation of the seat-frame, fork-frame, and associated parts to illustrate the raising and lowering mechanisms and the automatic disengaging mechanism for the fork-shaft under a modified form of construction.

The same letters of reference are used to indicate identical parts in all the figures.

One of the particularly novel features of this machine is the use of but one lever to perform the dual operations of adjusting the forks to the proper heights from the ground when in operation and stopping their movement or throwing the machine "out of gear," as commonly expressed. This lever is fastened to the seat-platform, having the usual quadrant and locking-pawl. It is connected with the crank-shaft frame by a suitable jointed connection, so that its movement will cause the rotation of the crank-shaft frame on a pivot near the seat of the frame, this rotation raising and lowering the forks to or from the ground, according to its direction.

It is evident that when the seat-platform is held practically in one plane by its permanent attachment to the harness of the horse or team and the crank-shaft frame is rotated as hereinafter described a great number of movements may be devised by which the relative movement of the two may be made to disengage parts of the driving means.

Referring to the particular machine illustrated in Figs. 1, 2, and 4, A represents the supporting-wheels of the machine, loosely journaled on the ends of an axle B. This axle has rigidly secured to it a rearwardly-extending fork-carrying frame, composed in this instance of four arms C, whose forward ends are clamped to the axle, which forms a tie-rod support for the same, and which arms are united between their ends by a tie-rod D to stay the arms and constitute a rigid framework, which I designate the "fork-carrying" frame.

The seat-frame is composed of a front wooden bar E and a rear angle-shaped metal bar F, of structural iron, having its forward ends, which are bent outward, as seen in Fig. 4, extending under the bar E and then bent upward to embrace the front edge thereof, where they are secured by bolts *a*, passed both vertically and horizontally through the parts, as seen in Figs. 1, 2, and 4. A metal cross-

bar G is secured between the bars E F at their middle and has a forward extension *b*, to which the swingle or double tree *c* of the machine is attached. In this instance it would be a swingletree, for the machine is shown provided with shafts or thills H, secured to the bars E F, as seen in Fig. 1. The rear corners of the bar F are provided with rearwardly and laterally extending lugs I, Figs. 1, 2, and 4, to which are pivoted forward extensions or ears J, projecting from the outer arms C of the fork-carrying frame in front of the axle B, and this pivotal connection unites the seat-frame to the fork-carrying frame in such a manner that the weight of the seat-frame and driver is utilized to balance the weight of the fork-carrying frame, which is thereby given what may be called a "floating motion," requiring but very little effort to raise and lower it, as will be readily understood.

The driver's seat K, Figs. 1 and 4, is carried upon the seat-frame E F, where it is supported in the usual or any suitable manner, and a hand lock-lever L, engaging a segment-rack *d*, secured upon the cross-bar G, is employed to raise and lower the fork-shaft frame by means of a forked arm M, whose rear forked end is pivoted upon the cross-bar D, as seen in Figs. 1, 2, and 4, or to any part of the fork-carrying frame and whose forward end extends through an aperture or guide carried by the lever L and has upon it on each side of said guide coiled buffer-springs *e f*, Figs. 2 and 4, the said springs at their inner ends serving as the yielding connection between the hand lock-lever L and the forked arm M.

By referring to Fig. 2 it is evident that if the ground-wheels pass over an obstruction or drop into a depression in the ground the shock will cause the compression of the spring *f* and give a gradual and easy movement. If, upon the other hand, the forks strike the ground or an obstruction, the spring *f* may not only be relieved of its tension, but I find it of great advantage to add the spring *e* to limit the upward movement, and by nearly balancing the weight of the fork-carrying frame by placing the connection of the seat-platform as at I J, Fig. 2, I am enabled to get a much more sensitive floating motion, which causes the forks to pick up all the hay cleanly, but does not strike the forks into the ground with any force.

The crank-shafts N for the operating-forks O are journaled to the rear ends of the arms C in a novel manner to be presently explained, and the upper ends of the fork-arms are connected by pivoted rods *g* to the cross-bar E of the seat-frame in the usual or any suitable manner.

The hub of each carrying-wheel A, Fig. 5, carries upon its inner side an interior ratchet *h*, (indicated by the dotted lines, Fig. 6,) and adjacent to this ratchet and mounted loose upon an inwardly-projecting sleeve upon the hub of each carrying-wheel is a large sprocket driving-wheel P, connected by a drive-chain Q with small sprocket-wheel R, fast upon the fork crank-shafts N. The outer side of the hub of each sprocket-wheel P is provided with one or more locking-dogs *i*, Figs. 5 and 6, suitably pivoted thereto and normally held in engagement with the internal ratchets *h* by means of any suitable spring *j* in order to lock the sprocket-wheel P to the carrying-wheel A when the latter is turning forward and to become automatically disengaged therefrom when it is turning backward after a manner well known in harvester and hay-rake constructions. The forward rotation of the wheels A and the sprocket-wheels P imparts revolution to the fork crank-shafts when the frame C is lowered to bring the forks into working contact with the ground, and the sprocket-wheels P are automatically disengaged from the wheels A to stop the revolution of the crank-shafts when the frame C is raised sufficiently to take the forks out of proper working position with the ground by means to be presently explained, which means are thrown into and out of action by the lowering and raising of the fork-shaft-carrying frame. Loosely journaled adjacent to the inner side of each of the hubs of the sprocket-wheels P—in this instance on an extension of the same sleeve of the carrying-wheels which carries the sprocket P—is a friction-disk S, Figs. 2, 4, 5, and 7, having on its inner face cam-shaped pockets *k*, Figs. 2 and 7, into which enter pins or projections *l* from the outer ends of the dogs *i*, which pins or projections also pass through slots *m*, Figs. 5 and 6, through the hubs of the sprocket-wheels P. Normally when the fork-carrying frame is down, with the forks at work, the pins *l* are at the outer ends of the cam-surfaces farthest from the center, with the dogs in engagement with their ratchet and with the disks S turning with the carrying-wheels and with the sprocket-wheels P; but when the fork-shaft frame is raised to lift the forks from the ground, dotted lines, Fig. 1, in order to transport the machine from place to place out of action it is necessary to arrest the rotation of the disks S, so that the continued forward movement of the sprocket-wheel will cause the pins *l* to be drawn inward toward the centers of the disks, and thereby cause the dogs *i* to be drawn out of engagement with the ratchet *h*, whereupon the sprocket-wheels P will become unlocked from the carrying-wheels A and the fork crank-shaft will come to rest, and the means which I employ to effect this automatic disengagement of the dogs are the following: Pivoted, as at *n*, Fig. 2, to each of the outer arms *c* of the fork-carrying frame is a brake-shoe *o* adjacent to each of the disks S, and the upper end of this brake-shoe, which projects above its pivotal point, is connected by a pivoted link *p* to the bar F, as at *q*. It results from this

construction that when the frame C is raised the upper end of the brake-shoe *o* is pressed backward and its engaging face comes in contact with the disk S and arrests the same with a gradual steady motion without shock or jar, and the further forward movement of the sprocket-wheel P through the action of the cam-pockets *k* causes the pins *l* to be drawn inward and the dogs *i* to be withdrawn from the ratchet *h*, as will be readily understood. When the frame C is lowered, the brake-shoe is released from the disk S and permits the springs J to throw out the dogs *i* in reëngagement with their ratchet *h*, as will be readily understood. The same effect would be produced if the upper projection of the brake-shoe *o* and link *p* were omitted, provided the lower end of the brake-shoe was connected by a pivoted link, as indicated in Fig. 10, Sheet 3, where the upper link *p* is dispensed with and a link *p'* is pivoted at its rear end to the lower part of the brake-shoe and extends forward and is connected to a forward part of the frame—as the bar E, for instance.

In a machine of this class, where the entire work is of a vibratory nature, it has been difficult to prevent the working loose of the bolts and rivets connecting the members of the usual framing together. In my invention the usual construction is entirely abandoned, and by interlocking the different parts in the line in which they offer resistance no strain whatever is put upon any bolt or rivet, and the whole of the frame, which is of unusual weight to receive the shock on the anvil principle, must move in practical unison. In providing a seat for the crank-shaft box of such a shape that the shock of the forks in striking the hay or ground when at work will simply seat them more firmly a very great advantage in the practical working of the machine is achieved. In order to take up the slack or wear of the chain, a bearing-box of unusual construction is shown in greater detail by Fig. 3, where the crank-shaft is indicated as N and the box by T T, clamped in place in pillow-block heads U upon the ends of the arm C by the U-bolt V. The two parts T T combine to form a sleeve which journals the crank N eccentrically, and by rotating the two pieces T T the distance between the axle B, which is fixed to the arm C and the crank N, is increased or diminished at will.

In the practical manufacture of machines of this class the crank-shaft is bent from round stock of considerable size, and it is impracticable to make these bends absolutely square. Any considerable endwise motion will therefore cause the rounded or bent part to enter and cramp itself in the box. It also throws the driving mechanism out of alinement and is generally undesirable. I have therefore constructed the box next to the driving-gears of a particular shape, a sleeve *r* extending out from the side of the box T, seated in the frame C, as shown in Fig. 8, and on the end of this sleeve there is formed a rib *s*. The sprocket-wheel R is made in the form of a shell *t*, with an enlarged sleeve or hub to enable its adjustment on the shaft N after the bends have been made and encompasses and clamps a conical bushing *u* to the shaft. On one end of the shell *t*, carrying sprocket R, a rib *v* is extended approximately one-half way around, as shown in Figs. 8 and 9, leaving room between the end of the conical bushing *u* and this rib *v* for the rib *s* on the sleeve *r* of the crank-shaft box T. One half of the bushing *u* is entered in the side of the sprocket-wheel R, turned partly over to make room for the entrance of the second half, and then they are clamped to their seat, making endwise movement impossible without any trappiness or additional parts.

Having thus fully described my invention, I claim—

1. In a hay-tedder, the combination of a seat-platform, a fork-carrying frame pivoted thereto, operating means actuated by the traction of the machine for normally operating the forks, a member rotated by the operating means whose non-rotation will disconnect said operating means, and a brake put into action by the lifting of the fork-carrying frame which will automatically engage and stop such member by the differential movement between the fork-carrying frame and seat-platform when the forks are raised a certain distance from the ground, substantially as described.

2. In a hay-tedder, the combination of forks normally driven by the traction of the machine, a gear-wheel revolving concentric with the ground-wheels, pawls having projecting parts normally rotating the gear-wheel with the ground-wheel when moving forward, a disk revolving with the gear-wheel, cam-surfaces on said disk engaging said projecting parts of the pawls, and means for automatically applying friction to the disk and thereby drawing the pawls from engagement with the ground-wheel when the forks are raised a certain distance from the ground, substantially as described.

3. In a hay-tedder, the combination of a ground-wheel, a fork-frame pivoted to the seat-frame, a gear-wheel moving concentrically with the ground-wheel, pawls pivoted in the gear-wheel and engaging with the ground-wheel, and a cam-wheel encompassing parts of the pawls and a friction-brake engaging the cam-wheel at certain positions of the fork-frame and free from the cam-wheel at other positions, substantially as described.

4. In a hay-tedder, the combination of a fork-carrying crank-shaft, a carrying-frame therefor, a seat-frame to which the carrying-frame is pivoted, a ratchet-wheel rotated by the traction of the machine, a drive-wheel on the same axis with said ratchet-wheel, dog mechanism between said drive-wheel and

ratchet, connecting mechanism between said drive-wheel and the fork crank-shaft, a friction-disk on the same axis with the ratchet-wheel, a connection between said friction-disk and the dog mechanism, and a brake for said friction-disk actuated by the angling of the crank-shaft frame and seat-frame, whereby the raising of the crank-shaft frame throws the brake-shoe into engagement with its disk and causes the disengagement of the dog mechanism and ratchet to stop the revolution of the fork-carrying crank-shaft, substantially as described.

5. In a hay-tedder, the combination of a fork-carrying crank-shaft, a carrying-frame therefor, a seat-frame to which the carrying-frame is pivoted a ratchet-wheel rotated by the traction of the machine, a sprocket-wheel on the same axis with said ratchet-wheel, dog mechanism between said sprocket-wheel and ratchet-wheel, a drive-chain connecting said sprocket-wheel and fork crank-shaft, a friction-disk on the same axis with the ratchet and sprocket wheels, a connection between said friction-disk and the dog mechanism, and a brake-shoe for said friction-disk actuated by the angling of the crank-shaft frame and seat-frame, whereby the raising of the crank-shaft frame throws the brake-shoe into engagement with its disk and causes the disengagement of the dog mechanism and ratchet to stop the revolution of the fork-carrying crank-shaft, substantially as described.

6. In a hay-tedder, the combination of a fork-carrying crank-shaft, a carrying-frame therefor, a seat-frame to which the carrying-frame is pivoted, a ratchet-wheel rotated by the traction of the machine, a drive-wheel on the same axis with said ratchet-wheel, dog mechanism between said drive-wheel and ratchet, connecting mechanism between said drive-wheel and fork crank-shaft, a friction-disk on the same axis with the ratchet-wheel, a cam connection between said friction-disk and the dog mechanism, and a brake for said friction-disk actuated by the angling of the crank-shaft frame and seat-frame, whereby the raising of the crank-shaft frame throws the brake-shoe into engagement with the disk and causes the disengagement of the dog mechanism and ratchet to stop the revolution of the fork-carrying crank-shaft, substantially as described.

7. In a hay-tedder, the combination of carrying-wheels, a fork-carrying crank-shaft, a carrying-frame therefor, a seat-frame to which the carrying-frame is pivoted, a ratchet-wheel rotated by the traction of the machine, dog mechanism for said ratchet-wheel, a sprocket-wheel on the same axis with said ratchet-wheel, a drive-chain connecting said sprocket-wheel and fork crank-shaft, a friction-disk on the same axis with the ratchet and sprocket wheels, a cam connection between said friction-disk and the dog mechanism, and a brake-shoe for said friction-disk actuated by the angling of the crank-shaft frame and seat-frame, whereby the raising of the crank-shaft frame throws the brake-shoe into engagement with the disk and causes the disengagement of the dog mechanism and ratchet to stop the revolution of the fork-carrying shaft, substantially as described.

8. In a hay-tedder, the combination of carrying-wheels, a fork-carrying shaft, a carrying-frame therefor, a seat-frame to which the carrying-frame is pivoted forward of the supporting-axis of the carrying-wheels, a ratchet-wheel rotated by the traction of the machine, a drive-wheel on the axis with said ratchet-wheel, dog mechanism between said drive-wheel and ratchet, connecting mechanism between said drive-wheel and the fork crank-shaft, a friction-disk on the same axis with the ratchet-wheel, a connection between the said friction-disk and the dog mechanism, a brake for said friction-disk actuated by the angling of the crank-shaft frame and seat-frame, and a single lever for raising and lowering the crank-shaft frame, whereby the raising of the crank-shaft frame throws the brake-shoe into engagement with its disk and causes the disengagement of the dog mechanism and ratchet to stop the revolution of the fork-carrying crank-shaft, substantially as described.

9. In a hay-tedder, the combination of carrying-wheels, a fork-carrying crank-shaft, a carrying-frame therefor, a seat-frame to which the carrying-frame is pivoted forward of the supporting-axis of the carrying-wheels, a ratchet-wheel rotated by the traction of the machine, a drive-wheel on the same axis with said ratchet-wheel, dog mechanism between said drive-wheel and ratchet-wheel, connecting mechanism between said drive-wheel and the fork crank-shaft, a friction-disk on the same axis with the ratchet-wheel, a cam connection between said friction-disk and the dog mechanism, a brake for said friction-disk actuated by the angling of the crank-shaft frame and seat-frame, and a single lever for raising and lowering the crank-shaft frame, whereby the raising of the crank-shaft frame throws the brake-shoe into engagement with the disk and causes the disengagement of the dog mechanism and ratchet to stop the revolution of the fork-carrying shaft, substantially as described.

10. In a hay-tedder, the combination of a seat-frame, a fork-shaft frame pivoted thereto, fork-carrying crank-shaft journaled on said fork-shaft frame, carrying-wheels for both of said frames, driving mechanism between said carrying-wheels and the fork-shaft, a single lever for angling said fork-carrying frame and seat-frame, spring buffer mechanism for said lever and means for connecting and disconnecting said driving mechanism by the lower-

ing and raising of the fork-shaft frame through the medium of said single lever, substantially as described.

11. In a hay-tedder, the combination of carrying-wheels, a fork-carrying crank-shaft, a carrying-frame therefor, a seat-frame to which the carrying-frame is pivoted forward of the supporting-axis of the carrying-wheels, a ratchet-wheel rotated by the traction of the machine, a drive-wheel on the same axis with said ratchet-wheel, dog mechanism between said drive-wheel and ratchet-wheel, connecting mechanism between said drive-wheel and the fork crank-shaft, a friction-disk on the same axis with the ratchet-wheel, a cam connection between said friction-disk and the dog mechanism, a brake for said friction-disk actuated by the angling of the crank-shaft frame and seat-frame, a single lever pivoted to the seat-frame and connected to the fork-carrying frame, spring buffer mechanism between said lever connections and fork-carrying frame, and means for connecting and disconnecting said driving mechanism by the lowering and the raising of the fork-shaft frame through the medium of the single lever, substantially as described.

12. In a hay-tedder of the character described, the combination of carrying-wheels, seat-frame, fork-carrying frame, fork-carrying crank-shaft, adjustable journal-bearings for the latter secured to thick members of the fork-carrying frame, sprocket-wheels having enlarged sleeves to pass the bends of the crank-shaft, a connection for receiving the end thrust of the crank-shaft between said sprocket-wheels and the adjacent shaft-journals, attaching-bushings for said sprocket-wheels, and driving connections between the sprocket-wheels and the traction-driven mechanism of the machine, substantially as described.

GEORGE L. ROBY.

Witnesses:
WM. J. PECK,
GUS. G. HAMPSON.