

JAMES LEE.

Improvement in Hay Tedders.

No. 123,710.

Patented Feb. 13, 1872.

Fig. 1.

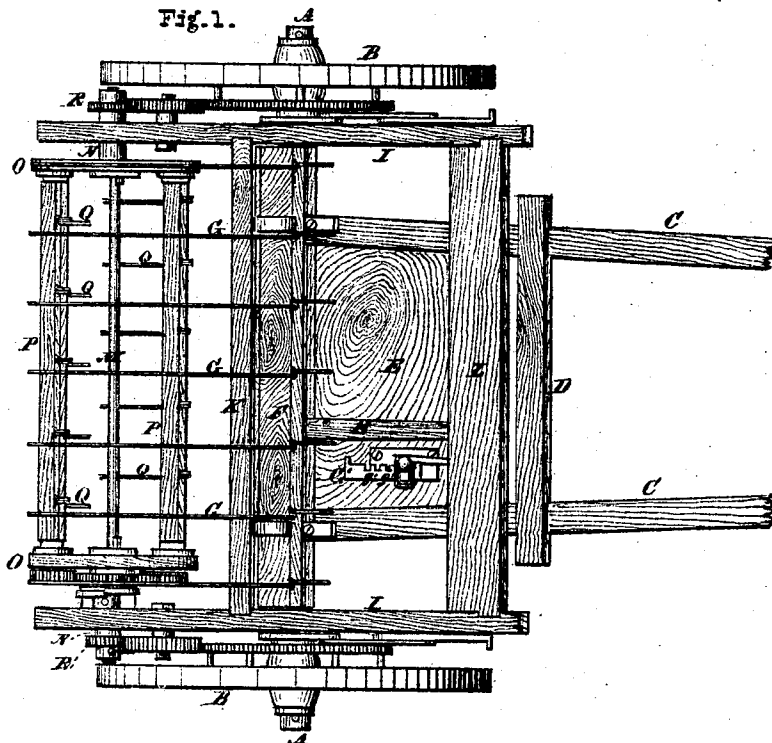
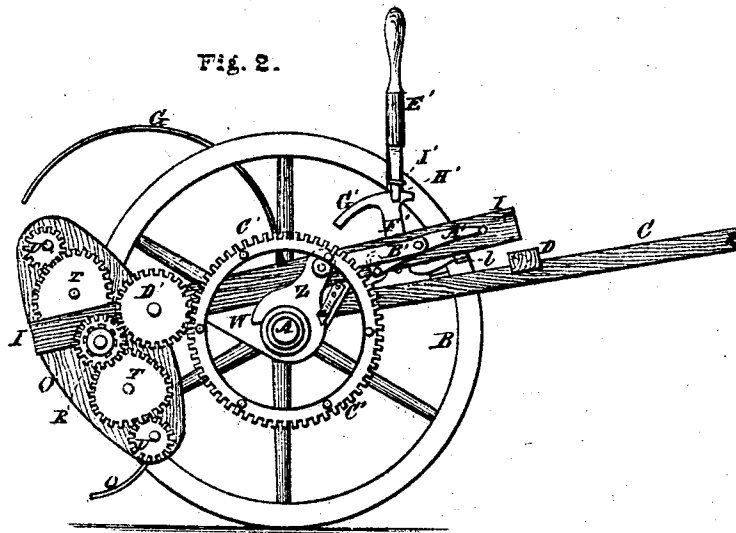


Fig. 2.



Witnesses.

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Fig. 3.

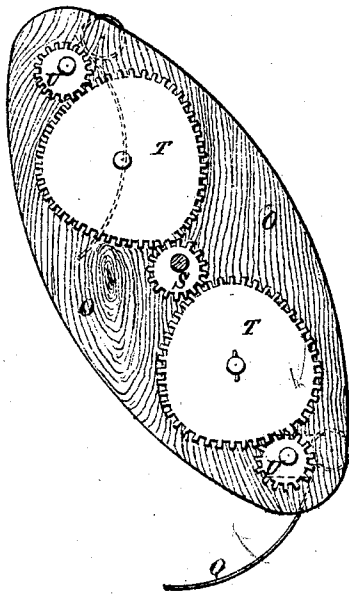


Fig. 9.

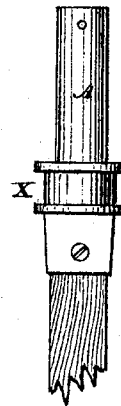


Fig. 10.

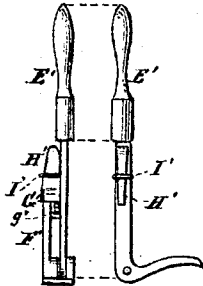


Fig. 4.



Fig. 5.

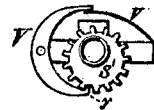


Fig. 6.

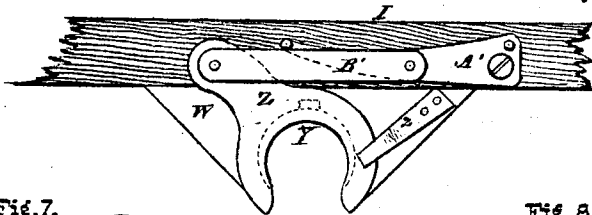


Fig. 7.

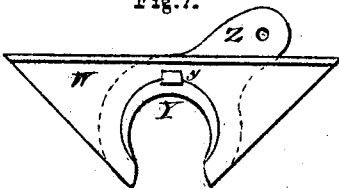
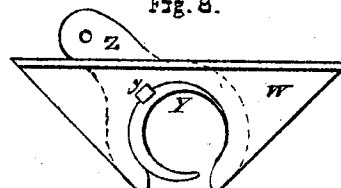


Fig. 8.



Witnesses.

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UNITED STATES PATENT OFFICE.

JAMES LEE, OF POTTSTOWN, PENNSYLVANIA.

IMPROVEMENT IN HAY-TEDDERS.

Specification forming part of Letters Patent No. 123,710, dated February 13, 1872.

To all whom it may concern:

Be it known that I, JAMES LEE, of Pottstown, in the county of Montgomery and in the State of Pennsylvania, have invented certain new and useful Improvements in Hay-Tedders; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing making a part of this specification, in which—

Figure 1 is a plan view of the upper side of my device. Fig. 2 is a side elevation of the same with the inner traction-wheel removed. Fig. 3 is an enlarged end elevation of the reel containing the pivoted tine-heads. Fig. 4 is a like view of the driving pinion and pawl for imparting motion to said reel. Fig. 5 is a side elevation of the adjustable "sun gear" for rotating said tine-heads. Fig. 6 is a like view of the outer side of the pedestal-box with its rotating eccentric jaw for connecting the tedder-frame to or upon the axle. Figs. 7 and 8 are similar views of said pedestal from its inner side, showing the different positions of the eccentric jaw. Fig. 9 is an enlarged plan view of the journal of the axle; and Fig. 10 is a front and a side elevation of the lever for controlling the vertical adjustment of the tedder.

Letters of like name and kind refer to like parts in each of the figures.

My invention is an improvement in hay-tedders intended for use upon or in combination with horse hay-rakes, or other similar wheeled machines; and it consists principally in the means employed for connecting the tedder-frame to or upon the axle, substantially as and for the purpose hereinafter set forth. It further consists in the employment of eccentric gearing for imparting to said tedder-teeth a variable rotary movement with relation to the reel, substantially as is hereinafter shown.

In the annexed drawing, A represents the axle, B the traction-wheels, and C the shafts of an ordinary horse hay-rake, the latter of which are connected together forward of said axle, by means of a cross-bar, D, between which said axle and shafts is secured a foot-board, E. Pivoted to or upon the axle is a rake-head, F, containing a series of curved teeth, G, and provided with a hand-lever, H, for tripping the frame, all of usual construction. The tedder-frame is composed of two

side-pieces, I, secured together in parallel lines by means of two cross-bars, K and L, attached respectively to their center and front ends, leaving a space at the rear of the frame for the tedder-reel, which, as seen in Figs. 1 and 2, consists of a central shaft, M, pivoted within suitable boxes N secured to or upon the lower side of the side pieces I, and having keyed upon its ends, immediately inside of said pieces, two heads, O. Pivoted within the heads O, near their outer ends, are two tine-heads, P, having each a series of short curved teeth, Q, of usual construction, which teeth are relatively arranged so as to "break joints" or overlap each other. The reel is caused to revolve within the frame by means of pinions R placed upon its outer ends and communicating through suitable gearing with the traction-wheels, while the tine-heads are caused to revolve within said reel, so as to "feather" their teeth by means of a pinion, S, attached to the inner end of one of the boxes N, and meshing with two gear, T, pivoted upon opposite sides thereof to the head O, which gear, in turn, mesh with two pinions, U, attached to the projecting ends of the rake-heads P, the whole forming what is known as a "sun and planet gearing."

The relative proportions of the pinions and gears above described are such as to cause the rake-teeth to maintain a general vertical position; but, in order that said teeth may work to the best possible advantage, it is necessary that they should strike the ground at a low angle, which angle should change as said teeth sweep to the rear, until, at the time of their leaving the hay, their general inclination should be turned upward and rearward. In order to produce such variable motion of the teeth I construct the pinions in the form of eccentrics, and give to the gears a cam shape, having as many faces or depressions upon their toothed peripheries, as said peripheries represent complete revolutions of said pinions. As thus constructed it will be seen that at certain points within the circle described by the tine-heads, they move much more rapidly than at opposite points, so as thereby to cause the angle of the teeth to continually change; and, by so adjusting said gearing as that said teeth shall strike the ground as their rotary movement is increasing, said movement being back-

ward with relation to the reel, will cause them to rapidly change from a downward and rearward to an upward and rearward inclination.

The radial adjustment of the tine-heads and teeth is effected by pivoting the pinion S upon the box N, and providing a suitable pawl to engage with and secure said pinion in place. The pawl used, V, has a general crescent shape, and is pivoted at its center upon said box N with its concave edge toward said pinion, in which position a flat spring, *v'*, is caused to press upward against its upper end, so as to bring its lower end against said pinion and cause an upward projecting spur, *v*, attached thereto to engage with the teeth of the pinion or with suitable depressions formed thereon. By pressing downward upon the upper end of the pawl its lower end will be released from engagement with the pinion and permit the same to be rotated, as desired. As the principal use made of the adjustability of this pinion will be to enable the teeth to be turned into line with the heads, so as to cause the device to occupy less room when not in use, I provide within the face of said pinion a groove, provided within its lower side with suitable teeth for engagement with the spur *v* and having a sufficient length only to permit said pinion to move the required distance, by which means it is only necessary to release and revolve the same until the detent strikes against either end of said slot in order to adjust the teeth for use or for storing the machine. The pinion R is pivoted loosely upon the shaft M, and caused to engage therewith when revolved forward by the following-described means: One side of the pinion is recessed out so as to receive a corresponding metal collar, *m*, attached to the shaft, which collar has upon or within opposite sides two semicircular recesses which receive and contain each a similar-shaped detent, *x*. The detent *x* is pivoted at one end to the collar *m*, while its opposite end is free to swing outward, so as to engage with suitable notches *r* provided around the interior of the recess within the pinion R when said pinion is revolved in one direction, while, in an opposite direction, said detent will be pressed by and slide over said teeth.

The device thus constructed is applied to the hay-rake by means of two pedestal-boxes, W, attached to and projecting downward from the lower side of the side pieces I, and fitting into corresponding bearings X provided upon the axles immediately inside the wheels, the lower side of said boxes being open, so as to permit them to be readily passed over or removed from said bearings.

In order that the tedder-frame may be locked in place when attached to the axle, I enlarge the opening within the pedestal-box W and fit loosely within the same a bushing, Y, having upon one side an opening corresponding to the diameter of the bearing X, which bushing has attached to one end a plate, Z, by means of which it may be rotated within its opening. As thus arranged, by causing the openings

within the sides of the bushing and pedestal-box to coincide, as seen in Figs. 6 and 7, they may be passed over the bearing X, after which said bushing may be revolved upon the axle, and within said pedestal-box until it occupies the relative position shown in Fig. 8, and effectually locks the latter upon said axle.

A lug, *y*, secured to the inner end of the bushing Y, and from thence projecting upward alongside the inner face of the pedestal-box, holds said bushing in place within the latter; but, as an additional safeguard, a flat spring, *z*, is secured at one end upon the outer face of said box and projecting inward has its opposite end bearing against the plate Z.

The periphery and interior of the bushing, although each formed upon a circle, have not a common center, but have such relative arrangement as to give to said bushing a crescent-shape, its thickest part being at its upper side, whence it regularly decreases in thickness until, at the lateral opening, its inner and outer surfaces come together. The effect of such an eccentric shape of the bushing is to cause the tedder-frame to move forward or back as said bushing is revolved upon the axle, the object of which will be hereinafter explained.

The bushing is caused to rotate within the pedestal-box by means of a lever, A', pivoted at one end to the side-rail I, and having attached between said pivoted end and its upper or free end a connecting-bar, B', the opposite end of which is, in turn, pivoted upon the upper end of the plate Z, so that as said lever is thrown forward or back, as shown in Figs. 2 and 6, the bushing will be rotated and the tedder-frame locked upon or released from the axle.

Attached to or upon the inner face of each traction-wheel B is a spur-gear, C', which meshes with a smaller gear, D', and the latter, in turn, with the pinion R, and thereby communicates the motion of said traction-wheels to the reel and pivoted tine-heads. The relative arrangement of the gears C' and D' cause them to mesh together only when the bushing Y is turned forward so as to correspondingly move the tedder-frame and lock it upon or to the axle, in consequence of which said gearing are thrown out of engagement by turning said bushing partly or wholly to the rear, such result being sought by giving the latter its eccentric form.

Being attached to the axle only at or by the pedestal-boxes, the tedder-frame is free to rock upon the axle, so as to raise or lower its rear end, and thereby adapt the operating mechanism to the variable surface of the ground and the quantity and weight of the hay. In order that such motion may be readily controlled and the tedder-frame secured in place, when adjusted, I employ a lever, E', provided at its lower end with an outward and upward projecting arm, loosely pivoted at said end to or upon the foot-board E, so that said arm shall pass beneath the cross-bar L and into a suitable metal loop or guide, I, attached upon the same. If now the upper end of the lever be moved to the

front or rear, the tedder-frame will be correspondingly rocked upon the axle and its rear end elevated or depressed.

Projecting upward beside the lever is a standard, F', having secured to and forming a part of its upper end a quadrant, G', provided upon its face next to said lever, with a series of notches, g'. A detent, e', projecting laterally outward from said lever engages with said notched segment, and secures the relative positions of the same and the lever, except when the latter is moved sidewise sufficiently to disengage said detent, after which said lever may be carried to the front or rear, as is desired. The detent is held in engagement with the quadrant by means of a spring, H', secured to the lever, and from thence projecting outward and downward with its free end bearing against the outer face of said quadrant. A metal strip, I', projecting horizontally outward from said lever, and provided with a suitable slot for the passage of said spring holds the latter in position, and prevents derangement, while at the same time offering no obstacle to a sufficient lateral movement of the lever to disengage the same from the quadrant.

The device is now complete, and affords an efficient, durable, and comparatively cheap means for spreading hay; but while, for convenience of illustration, it is shown attached to a hay-

rake, it may be readily seen that said device may, with equal readiness and ease, be attached to or upon any similar wheeled implement.

Having thus fully set forth the nature and merits of my invention, what I claim as new, is—

1. The means employed for connecting the tedder-frame with the axle, consisting of the pedestal-boxes W, the rotating open bushings Y, and the plates Z, combined substantially as shown and described.

2. Also, in combination with the bushing Y and plate Z the means employed for rotating the same, consisting of the lever A' pivoted to or upon the side-rail I, and connected to or with said plate by means of the connection B', substantially as and for the purpose shown.

3. Also, the means employed for imparting a variable rotary motion to the pivoted tine-heads with relation to the reel, consisting of the eccentric pinions S and U and the cam-shaped gears T, combined in the manner and for the purpose substantially as shown and described.

In testimony that I claim the foregoing I have hereunto set my hand this 9th day of March, 1871.

Witnesses:

JAMES LEE.

GEO. S. PRINDLE,
JOHN R. YOUNG.