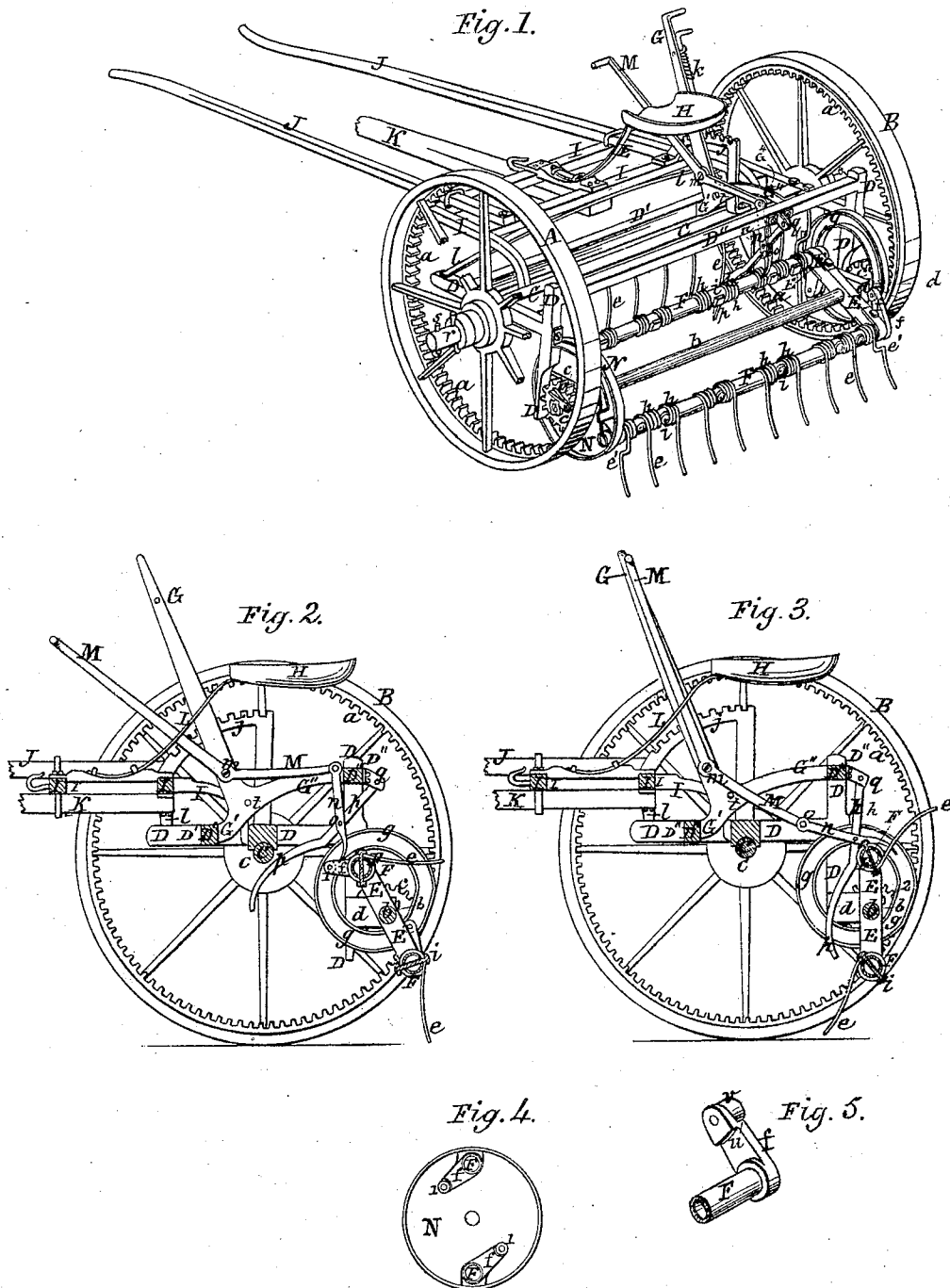


S. PERRY.
Combined Rake and Tedder.

No. 136,539.

Patented March 4, 1873.



Witnesses.
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UNITED STATES PATENT OFFICE.

STUART PERRY, OF NEWPORT, NEW YORK.

IMPROVEMENT IN COMBINED RAKES AND TEDDERS.

Specification forming part of Letters Patent No. 136,539, dated March 4, 1873.

To all whom it may concern:

Be it known that I, STUART PERRY, of New-
port, in the county of Herkimer and State of
New York, have invented certain new and
useful Improvements in Rotary Hay-Tedders,
that are convertible into hay-rakes when de-
sired; and I do hereby declare the following
to be a full, clear, and exact description of the
same, reference being had to the accompany-
ing drawing making a part of this specifica-
tion, in which—

Figure 1 represents, in perspective, a view
of the machine looking in the direction from
its rear toward its front. Fig. 2 represents a
sectional elevation of the same. Fig. 3 repre-
sents, in sectional elevation, the machine as it
appears when the teeth are reversed to con-
vert the machine into a rake. Fig. 4 repre-
sents the crank-arms of the teeth-bearing shafts
when said shafts are reversed in converting the
machine from a tedder to a rake. Fig. 5 repre-
sents, in perspective, a portion of one of the
teeth-bearing shafts and its crank-arm on an
enlarged scale.

Similar letters of reference, where they oc-
cur in the separate figures, denote like parts
of the machine in the drawing.

This invention relates to the construction and
arrangement of devices in a rotary hay-ted-
ding machine, which, when so desired, may be
converted into a revolving hay-rake.

To enable those skilled in the art to make
and use my invention, I will proceed to de-
scribe the same with reference to the drawing.

The ground-wheels A B are supported on
the ends of a through-axle, C, which extends
clear across and carries the main frame D by
both of its sides. These ground-wheels A B
are also the carrying and driving wheels of the
machine. The sides of the main frame D are of
a T form, and are cross-braced, as at D'', and
hinged to the axle C, so that they may vibrate
thereon. The ground-wheels have each inter-
nal gears *a a* formed on them, which mesh in-
to and turn two pinions, *c c*, that have a ratch-
et-and-pawl attachment connected to or with
them, so that they shall turn with the through-
shaft *b* of the reel when it is to run forward,
and slip when the shaft is run or turned in an
opposite direction. The shaft *b* of the reel is
supported and turns in bearings *d* arranged
upon the lower ends of the vertical end pieces

of the main frame. Upon this shaft *b*, at or
near each of its ends, are fastened cross-heads
E, in the ends of which are supported, so that
they may turn in said cross-heads, the teeth-
carrying shafts F F, upon which the tines or
teeth *e* are arranged. These shafts F, though
revolving with the shaft *b* and its cross-heads E,
have an independent motion on their own axes,
as follows: The shafts F project through the
cross-heads, and have at one of their ends, viz.,
that one on the right of the machine, as shown
in Figs. 1 and 5, crank-arms *f*, upon the ends
of which there are friction-rolls 1 that run in
a cam-way, *g*, fastened to the main frame, so
that as the reel, as a whole, revolves around
the shaft *b* as an axis, the shafts F have an
independent motion around their own axes,
caused by their crank-arms and the cam-way
they run in. The cam-way *g*, at the part near-
est the main shaft *b* of the reel, is concentric
with said shaft for a certain distance, and is
so placed that the independent motion of each,
in turn, of the teeth-bearing shafts has ceased
when the friction-roll 1 enters this part of the
cam-way, the teeth having then been fully re-
stored to their normal position. This full res-
toration of the teeth to their normal position
is effected just before they enter the grass, and
their motion is neither accelerated nor retard-
ed by the cam-way while they sweep and lift
the grass from the ground; but after they have
reached a certain height the friction-roll of the
crank-arm governing their independent motion
leaves the concentric part of the cam-way and
enters another and a differently-formed part,
as at 2, and this causes the teeth to dip back-
ward, to prevent them from carrying the grass
over the reel. This could not be accomplished
by a circular cam-way, even though it be ec-
centrically arranged in regard to the main reel-
shaft, nor by a direct crank-movement; and,
though I have shown but two teeth-bearing
shafts arranged in the reel, three or more may
be used, each having a crank-arm and a fric-
tion-roll or slide taking and working in the
cam-way. The shafts F are made of wrought-
iron, and of tubular form, not only for the sake
of lightness and strength, but to give a suit-
able support to large, and consequently bet-
ter, coils of the spring-teeth, and thus dis-
pense with many supporting-pieces required
for such coils when the usual small solid iron

rods are used. Each pin or bolt *i* passes directly through one of the tubular shafts *F* and securely fastens two of the separate grass-spreading teeth *h h*. The ground-wheels of rotary tedders, as generally constructed, run upon and crush down some of the grass that is to be teded, and the outer tines of the reel are not near enough to these wheels to raise the grass back of them. To remedy this defect I bring the ends of the shafts *F* as near as possible to said wheels, and then, by bending outward the outer tines *e'* of the series, they are brought still nearer to said wheels, so as to take up and ted the grass over which they roll. A hand-lever, *G*, projects upward into convenient position, so that the operator in his seat *H* may grasp and use it. This lever is forked or branched at its lower end, one branch, *G'*, being fastened to the front cross-bar *D'* of the main frame, and the other branch, *G''*, being fastened to the rear cross-bar *D''* of said main frame. The main frame, as above mentioned, is hinged to, so as to vibrate upon, the main axle *C*, and the branches of the hand-lever *G* straddle the axle, so that the main frame is easily rocked upon said axle by the operator. To the axle *C*, and to the thill and tongue-frame *I*, (which latter is practically a part of, being rigidly fastened to, said axle,) is fastened a toothed sector, *j*, into which a spring hand-bolt, *k*, that moves in guides on the hand-lever *G*, will shoot or catch and hold the main frame in its adjusted position. The reel, being hung in the rear under portion of the main frame, as above described, is raised or lowered with said main frame, so as to work further from or nearer to the surface of the ground, as the nature of the crop or the surface of the ground itself may require. The thill and tongue frame *I* supports and carries the thills *J*, which are on the top of said frame, the tongue or pole *K*, which is arranged on the under side of said frame, and the spring seat-support *L*, which is on the cross-bar thereof. There is also connected to this tongue and thill frame a long semi-elliptic spring, *l*, against the points or ends of which the main frame brings up when its front is raised up to correspondingly lower the rear thereof. Pivoted to the hand-lever *G*, as at *m*, there is a bell-crank hand-lever, *M*, having an arm, *n*, pivoted to its lower end, which arm is also pivoted at *o* to a third arm, *p*, suspended from the main frame at *q*. The arms *n* and *p*, beyond their pivotal connection, form a fork, which under certain circumstances straddles the upper or inactive tooth-carrying shaft, and so holds the under or active shaft to its work when the machine is arranged and worked as a rake to gather the hay into windrows, as will be hereafter explained.

The journals *r*, Fig. 1, of the main axle *C*, are made long enough and with a second pin, *s*, so that when the machine is converted from a tedder to a hay-rake the ground-wheels *A B* may be moved and held out of gear with the pinion *c* of the reel, to prevent the latter

from turning except at the will of the operator, who holds, controls, and releases the reel or rakes by means of the lever *M* and its appliances, as above stated.

In Figs. 1 and 2 the machine and its several appliances are shown in the positions they assume when used for teding. In Fig. 3 the various parts are shown in the several positions they assume when the machine is changed and used as a rake.

To convert the machine from a tedder to a rake the teeth-bearing shafts *F* are detached, taken out, and reversed end for end, and their crank-arms *f* being out of use in this condition they are inserted in openings made in a shield, *N*, that revolves with said shafts, as seen in Fig. 4, and in this condition are not liable to catch or wind up the grass, and prevent the shafts from turning in their bearings. When the arms *n p* are holding against the upper shaft to prevent the rakes from turning, the arm *M* is supported by a stud or pin, *t*, against which it comes, and it and its linked arm *n*, being in a straight line, or a little knuckled, or below a straight line, will hold the reel, then acting as a rake, from turning. By shifting the lever *M*, as seen in Fig. 2, the reel or rake is released and will turn when the lever is again shifted to catch the next shaft, and hold and release it as the operator may elect.

The crank-arms *f* on the tubular, teeth-bearing shafts *F*, as seen on an enlarged scale at Fig. 5, have "set-backs" *u* upon them, which admit of longer bearings for their friction-rolls *v* that run in the cam-way, and at the same time allow the shafts, or rather their ends, to come so near the ground-wheels that their outwardly-bent teeth *e'* may take up and ted the grass over which the ground-wheels run, and even that somewhat beyond them.

The ground-wheels may be of wood, and the cogged rim or internal gears of iron, and fastened to the wheels. The through-axle *C* is of iron, strengthened by a backing of wood between the wheels.

To give strength to the reel-frame *D*, and space for the reel to work in, and to partly balance the weight of the reel, this frame *D* lies across the axle-tree *C*, and should have a bar in front of the axle-tree connecting its side pieces. The usual straight thill and tongue attachments to the axle-tree would, by being in the way of the cross-bar, be an obstruction to the desired movements of the frame. For this and other reasons I make these attachments with iron pieces, bent upward in a curved form, which admits of a greater elevation for the operator's seat, and a foot-frame that is horizontal when the thills or the tongue is used.

In the construction of this machine there are several important considerations, which I desire to state, as they may not seem so important to the eye or simple observation: First, the through shaft and axle keep the gears in true mesh, and thus prevent undue friction, binding, or wearing away. Second, notwithstanding the through main axle, the bringing

of the reel so close to the axle as not to endanger its teeth on the one side by the inequalities of the ground over which the wheels may be passing and those over which the reel is working, and, on the other hand, not to miss any of the grass on the ground, and yet leave the reel capable of such vertical adjustment as is required. All these involved much experiment. This proximity of the reel to the axis of the ground-wheels also prevents much of the lateral strain upon the teeth when the machine is being turned around at the end of the field or land. Third, that though the reel works within a plane passing inside of the rear of the ground-wheels, its outside teeth are made to take up, or draw out and ted, the grass that said ground-wheels may be passing over or upon.

In going to or from the field the carrying-wheels may be slipped out to the ends of the journals, and so take them out of gear with the reel, and allow the latter to remain at rest; or, instead of slipping these wheels outward, the pinions may be allowed to run without running the reel, by fastening the pawls so that they cannot engage with the ratchets.

Having thus fully described my invention, what I claim is—

1. The combination of the supporting and driving wheels, turning independently of each other on a continuous axle-tree, the T-shaped main frame *D D'*, the rotating reel hung upon the said main frame in rear of the axle-tree and within the wheels, and carrying tine-bearing shafts having rigid arms, which connect them with a cam-way, and the cam-way fastened upon the said main frame, all constructed and arranged substantially in the manner and for the purpose described.

2. In a rotary tedder, the combination of

a reel having rocking tine-shafts, each connected by its single rigid arm and friction-roll or slide to a cam-way, *g*, which controls its rocking movement, and the cam-way *g* having that part of its track which controls the tines, while acting on the grass in the form of a true circle, concentric with the axis of the reel, for preventing either acceleration or retardation of the tines while acting on the grass, and the other part formed so as to cause the tines to dip backward after lifting and be restored again before entering the grass, substantially as and for the purpose described.

3. The wrought-iron tubular tine-shafts *F*, in combination with a series of grass-spreading tines coiled around each of said tubular shafts, and fastened thereto by bolts which pass directly through them, substantially as described.

4. In combination with the main frame, hinged to the axle-tree, the branched lever which spans or straddles the axle-tree, and serves as brace and lever, substantially as described.

5. In combination with a reel for tedding hay, the reversible tine-bearing shafts or bars for converting the machine from a tedder to a rake, and devices *n p*, serving as a stop to prevent said shafts or bars from turning in their bearings when in the rake form, substantially as described.

6. In combination with a reel that is convertible to a rake, the rake-lever *M* and its appliances for controlling the reel when working as a rake, substantially as described.

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Witnesses:

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