

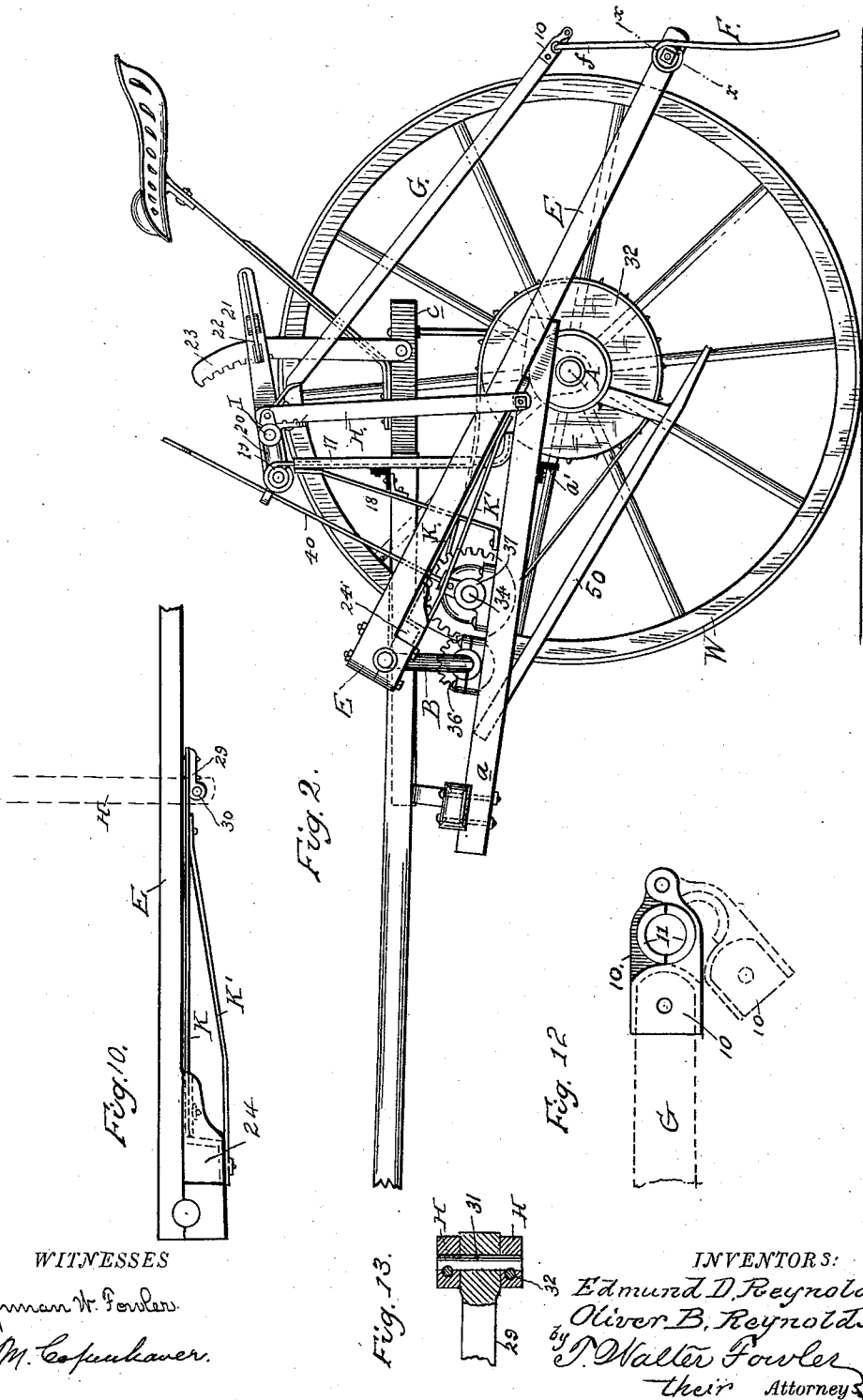
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3 Sheets—Sheet 2.

E. D. & O. B. REYNOLDS.
HAY TEDDER.

No. 578,500.

Patented Mar. 9, 1897.



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INVENTORS:

Edmund D. Reynolds
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By J. Walter Fowler
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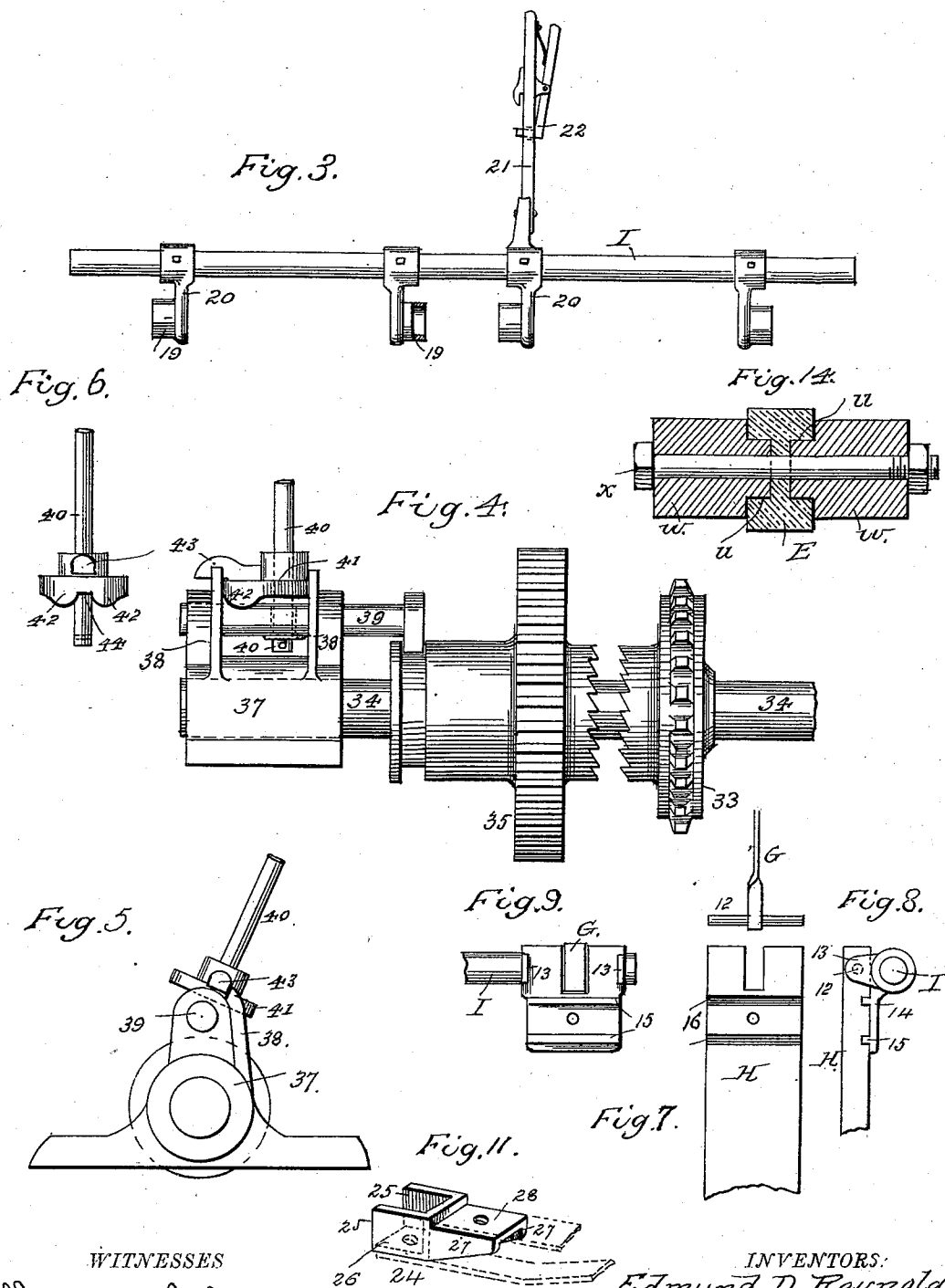
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UNITED STATES PATENT OFFICE.

EDMUND D. REYNOLDS AND OLIVER B. REYNOLDS, OF BROCKTON,
MASSACHUSETTS.

HAY-TEDDER.

SPECIFICATION forming part of Letters Patent No. 578,500, dated March 9, 1897.

Application filed March 27, 1896. Serial No. 585,061. (No model.)

To all whom it may concern:

Be it known that we, EDMUND D. REYNOLDS and OLIVER B. REYNOLDS, citizens of the United States, residing at Brockton, in the county of Plymouth and State of Massachusetts, have invented certain new and useful Improvements in Hay-Tedders; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Referring to the accompanying drawings for a more complete explanation of our invention, Figure 1 is a rear perspective view of a hay-tedder embodying our invention. Fig. 2 represents a side elevation of a hay-tedder embodying our invention, showing one of the main bearing or supporting wheels and all of the forks, except one, and their attachments removed. Fig. 3 is a detail of the supporting-shaft and its operating-lever. Fig. 4 is an enlarged detail of the clutch and mechanism for throwing the tedder-arms into and out of connection with the driving mechanism. Fig. 5 is a view of one end of Fig. 4. Fig. 6 is a detail of the clutch-shifting cam and its shaft. Fig. 7 is a detail of a portion of one of the links or bars which suspend the tedder-arms and showing the pin or bolt which connects it with the bar which secures the upper end of the fork. Fig. 8 is a view of a portion of the suspending-shaft, showing one of the castings in which it is journaled. Fig. 9 is a side view of Fig. 8. Fig. 10 is an enlarged view of the forward end of one of the tedder-arms, showing the spring-plates and the manner in which they are secured. Fig. 11 is a perspective view of the casting to which the forward ends of the spring-plates are secured. Figs. 12, 13, 14, 15, and 16 are details to be referred to.

Our invention relates to agricultural machines, and particularly to the class of such machines denominated "hay-tedders," which are provided with forks operated by means of a crank-shaft and connections as the machine is drawn over the ground; and our invention consists of the parts and the constructions and combinations of parts which we shall hereinafter describe and claim.

In the accompanying drawings, A represents a main shaft or axle suitably supported

in hangers or bearings, and W indicates one of the main supporting or bearing wheels, which may be located outside of the main frame in cases where the machine is of ordinary width and has, say, a single fork operating outside of the plane of rotation of the contiguous supporting-wheel, or these wheels may be located inside of the frame in machines of greater width and intended to operate in a wide swath and where the fork-operating crank-shaft is extended beyond the sides of the frame to receive two or more forks for operation outside of the plane of rotation of the contiguous main wheel. In very wide machines the placing of the wheels inside of the outermost sides of the frame brings them closer together, strengthens the frame, and obviates a great deal of vibration due to the operation of the machine.

The main frame may be of any well-known construction. It is herein shown as comprising longitudinal beams *a* and transverse beams *a'*, one or both of which may be of angle-iron form, as shown.

There may be any desired number of beams *a*, and above them is supported a longitudinal beam *c* for facilitating the attachment of a pole.

Within suitable boxes or bearings on the beams *a* the main operating crank-shaft B is mounted, said shaft having any desired number and arrangement of cranks, depending upon the number of tedder-arms used, the cranks being set at different inclinations to give the desired movements to the forks.

Upon the crank portions of the shaft B the forward ends of the tedder-arms E are pivotally journaled, and the rear ends of the arms serve as bearings for the forks F, which latter may be of any well-known type, but are herein shown as consisting of a single piece of heavy spring-wire coiled at the center upon each side of the arms and thence extended upwardly to form short arms *f*, which are loosely passed through a bearing on the rear ends of the bars G, said bearing consisting of two opposing castings 10, (see Fig. 12,) one on each side of the bar G, having matching grooves 11 to receive the upper end of the fork, said castings being bolted together at their forward ends by a bolt passing through

them and the bar and having their rear ends hinged upon a pin or bolt, whereby the casting may be opened to admit and detach the upper ends of the forks.

- 5 The forward ends of the bars G, of which latter there are as many as there are tedder-arms, are connected to the upper forked or slotted ends of substantially vertical links or bars H by means of a pin 12 passing through
10 the link and bar and confined in place and prevented from accidental displacement or lateral removal by means of lugs or ears 13 on a casting 14, having ribs 15, adapted to be seated in grooves 16 in the upper end of the link or bar H to give the casting a rigid and
15 substantial seat, said casting having also an eye or bearing for the transverse shaft I, which carry and about which the links H are allowed to swing back and forth. Just in
20 advance of the links H is a standard or support comprising a channel-iron member 17 and a brace 18, the two being securely bolted together and to the frame, substantially as shown in Fig. 1.
- 25 To the upper end of each of the channel-irons 17 is bolted a plate whose outer end is turned to form an eye to receive the hollow stud or journal 19 of a link or arm 20, bolted to the shaft I and forming a strong and rigid
30 fulcrum connection between this shaft and the standard and also forming the pivotal center about which the shaft I and its entire series of links and connections may be moved in vertical planes, it being understood that
35 the links themselves pivot upon the shaft I and are thereby allowed a back-and-forth movement.

- A lever 21, extending from one of the links or arms 20, serves to raise and lower the shaft
40 I and to secure the tedder-arms and their adjuncts in any adjusted position by means of a pawl 22 on the lever engaging a curved rack-bar 23, as shown.

- The connection between the suspending-
45 links H and the tedder-arms is one which is designed to enable these arms to yield vertically under a predetermined strain, as when the forks meet an unyielding obstacle too heavy to be safely lifted, and yet enable us
50 to make the arm rigid in itself, and this connection we will now describe. The forward end of the tedder-arms E, which receives one of the cranks of shaft B, is provided just back of the shaft with a box or casting 24, similar
55 to the one shown in Fig. 10. At the forward end this casting is open at the top and at one end, thereby leaving two vertical sides 25 and a bottom or flange 26, while at the rear the casting has two depending side walls 27, an
60 open bottom, and a closed recessed or sunken top 28, which latter forms a broad flat seat for one end of a flat spring-plate K, riveted to the top plate 28, while a similar spring-plate K' is likewise riveted to the under face
65 of the bottom or flange 26, and the two spring-plates extend rearward, one substantially straight and just below the under side of the

tedder-arm, while the other plate extends rearward and upward and joins at its rear the first-named plate at a point short of the
70 extremity thereof. The connection may be a simple rivet, and the rear end of the upper plate beyond this point of junction of the two plates has secured to it a casting 29 with an eye or lug 30. The lower ends of the links
75 or bars H are forked and straddle the tedder-arms E and this casting, and a pin 31, passed through these ends and the eyes or lugs 30, secures the links in place and is in turn prevented from dislodgment by means of pins
80 32, (see Fig. 13,) passed through the forks of the links and engaging grooves formed in the pin or bolt 31.

If desired, the spring-plates may be parts of a single piece of spring metal folded upon
85 itself to form the separate members, but the description first given of these plates is the preferred one; but in either case the lower and inclined plate serves as a brace to stiffen and strengthen the whole spring, and the
90 spring-plates allow the arms to rise until the obstruction is passed, when the spring-plates act to return the arms and forks to their normal positions.

As the link H, to which each tedder-arm is
95 connected, is held against vertical movement and has its lower end forked over the said arm and connected with the rear end of the springs, it is apparent that said arm may rise in the forked end of the link, thereby de-
100 pressing the rear ends of the springs K and K'. When these springs are thus depressed, the upper one K will have its free end carried downward, and the rear end of the lower or brace spring K', which is secured to it, will
105 be bowed upwardly and will for a portion of its length be caused to progressively engage and lie closely against its opposing member K, this movement being largely due to the
110 endwise pushing action given the lower inclined spring by the movement of the upper spring.

A spring connection like the foregoing is very light and at the same time stiff and requires but little, if any, more power to effect
115 its total depression than it does to start it. In other words, the resistance of the springs at their greatest depression is nearly the same as that at the commencement of their movement. This spring connection will also be
120 found useful in other places than as a connection for a tedder-arm.

The second part of the present invention relates to the manner of attaching the forks to the rear ends of the tedder-arms. Hereto-
125 fore it has been usual to bore a hole in the arm and fit a long spool therein to serve as a bearing for the fork. This construction greatly weakened the arm at this point and often was the cause of the arm splitting. In
130 our present case we correct this objection by forming a socket *u* partly through each side of the arm and then secure in these sockets the short spools *w*, upon which the coils of the

forks are fitted, the said spools being themselves secured in position and to each other by means of bolts α or equivalent devices, as shown in Fig. 14. With this construction but little of the wood of the tedder-arm is removed. Therefore there is no appreciable weakness in the arm at the point mentioned.

The machine has a support for the usual seat for the driver, and power to operate the tedder-arms is derived through a large sprocket-wheel 32 on the shaft A, from which a chain extends to a sprocket-wheel 33 on a shaft 34 near the front ends of the arms, said shaft 34 also carrying a gear-wheel 35, adapted to engage and drive a pinion 36 on the crank-shaft B. In front of the chain is the usual guard 50. In order that the crank-shaft may be connected to or disconnected from the power devices, we employ the shifting mechanism shown in Figs. 4 and 5. These consist, primarily, of a fixed casting or bearing 37 for the shaft 34, having upwardly-extending lugs 38, which are bored to receive a sliding bolt 39, one end of which carries a yoke to embrace a grooved hub on the slidable gear-wheel 35, said gear-wheel having on its opposite face a clutch member to engage a similar member on the sprocket-wheel 33. The slidable bolt 39 at a point between the lugs 38 is bored vertically to receive a turnable rod or shaft 40, which is slidably mounted in the bolt and carries an eccentric plate or disk 41 with two corresponding wings 42 and a lug or arm 43. The wings are separated from each other at one side by a recess or groove 44, Fig. 6, and when the rod or shaft 40 is turned it fulcrums in the slidable shaft and its periphery or outer edge, contacting with the inner face of one of the lugs 38, fulcrums thereon and causes the bolt 39 to slide through these lugs until the recessed portion 44 of the eccentric plate or disk aligns with and engages the bolt and the gear and sprocket wheels have been thrown into or out of clutch, this result being dependent upon the direction in which the bolt is made to slide. At the completion of the throw of the bolt the arm or lug 43 contacts with a shoulder on the lugs 38 and arrests further movement in that direction.

The foregoing provides a simple and effective means for throwing the tedder-arms and forks into and out of connection with the power mechanism.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. A hay-tedder having approximately horizontal arms, a connection depending from the machine and having a fixed suspension from above, and spring-plates carried by the forward ends of the arms and having their rear ends connected with the lower ends of the fixed connection, substantially as herein described.

2. In a hay-tedder, the tedder-arms thereof having separated spring-plates secured at their forward ends to the under side of the

forward portion of the arms, and having their opposite rear ends joined or connected to a fixed connection whereby the arms yield when meeting an obstruction, and forks carried by the rear ends of the arms, substantially as herein described.

3. In a hay-tedder, the substantially rigid tedder-arms having the forks at one end and having their opposite ends mounted upon the crank-shaft of the machine, the depending links having a fixed connection above and having their lower ends bifurcated, and adapted to straddle the arms, and independent spring-plates secured in pairs at their forward ends to the under side of the arms and having their rear ends joined together, with the extremity of one plate attached to the lower end of the contiguous link, whereby the tedder-arms yield against the power of the springs.

4. In a hay-tedder having a crank-shaft, the tedder-arms mounted at their forward ends upon said shaft, forks carried by the rear ends of said arms, and links depending from a fixed connection above and having their lower ends embracing the arms at points between the front and rear ends, in combination with a spring connection between the links and arms having one end secured to the arms and the other end secured to the links, substantially as herein described.

5. In a hay-tedder having a crank-shaft, tedder-arms and links for suspending the arms from a fixed connection above, the plates K and K' forming a spring connection between the links and arms and adapted to yield when a predetermined strain is brought upon the forks, substantially as herein described.

6. In a hay-tedder having a crank-shaft, tedder-arms and links having a fixed connection above, a duplex spring connection between the links and forward portions of the arms, said springs being secured at their forward ends to the forward ends of the arms and having their opposite ends secured to the links, the springs being separated and one inclined with relation to the other, whereby they are depressed and come together for a portion of their surfaces when the rear of the arms is lifted, substantially as herein described.

7. In a hay-tedder, the combination of the main frame, the crank-shaft, the tedder-arms mounted at their forward ends on said shaft, the forks carried by the rear ends of the arms, the links having an upper fixed connection and having lower ends forked over the arms back of the crank-shaft, a spring-plate lying under the arm and secured by its front end thereto, a second plate below the arm, inclined with relation to the opposing plate, and having its front end secured to the forward end of the arm, said springs having their rear ends united and attached to the ends of the links below the arms, substantially as herein described.

8. An arm or bar pivotally hung at one portion and having its opposite portion capable of movement, and a yielding connection formed of spring-plates separated to form a converging space, the separated portions of the plates being connected with the pivotal end of the arm or bar and the contracted portions connected to a fixed support at a point between opposite ends of the arm or bar.

9. An arm or bar pivotally hung at one end and having the opposite end capable of a swinging movement and a spring connection between the arm or bar and a fixed support intermediate of the ends of the arm or bar, said spring connection consisting of a member substantially parallel with the bar and a second member inclined with relation to the first member, separated from the latter at one end and having the opposite end connected to the first member, the separated ends of the spring being secured to the bar and the connected ends to the support whereby a movement of the free end of the arm or bar causes the straight member of the spring and the free end of the inclined member to be depressed and the middle portion of the inclined member to be bowed into contact with successive portions of the straight member.

10. A spring connection interposed between a fixed support and a pivotally-hung arm or bar whose free end is capable of a swinging movement, said connection consisting of two superposed members separated at one end said separated ends secured to the bar and the opposite ends brought together and joined at the support whereby one of said members serves as a brace for the other member and has its middle portion adapted for gradually-progressive engagement with the contiguous surface of the other member to equalize the resistance thereof, and maintain a substantially uniform resistance to the lifting action of the arm from the beginning of its movement to the completion thereof.

11. In a hay-tedder, the tedder-arms and their actuating mechanism, the spring-forks secured near their centers to the rear ends of the arms, having extensions above and below, bars extending from forks to a fixed support above, means for detachably connecting the upper ends of the forks to the bars, consist-

ing of opposing castings one on each side of the bars said castings being hinged together at one end and means whereby the free ends of the castings are detachably bolted to each other and to the bars.

12. In a hay-tedder, the tedder-arms and forks, means for operating the same, the suspending-links, the bars connecting the upper ends of the forks with the links, said links being bifurcated to receive the bars, pins passing through the bars and links, a casting on each link having an eye and having side lugs to embrace the links and prevent endwise movement of the pin, a shaft passing through the eye and suspending the links, and about which the links pivot, standards or supports, arms fixed to the shaft and fulcrumed on the standards and means for raising and lowering the tedder-arms and connections.

13. In a hay-tedder, the crank-shaft, the tedder-arms and forks operated thereby, the driving mechanism including a shaft having a gear-wheel and sprocket each having a clutch-surface, and means for throwing the gear and sprocket into and out of gear comprising spaced lugs, a bolt adapted to slide therein and to shift the driven gear, an eccentrically-mounted plate or disk fulcrumed on said slidable bolt and adapted to engage the inner walls of the spaced lugs, and force the bolt in and out, said plate or disk having depending wings and a turnable rod slidably mounted in the bolt for operating the disk axially.

14. In a hay-tedder, the combination, of the tedder-arms, the bars G, means whereby the arms and bars are operatively secured, the forks, the upper ends of which are mounted in the rear ends of the bars, the short spools seated in sockets made partly through the side faces of the arms, and receiving the coils of the forks, a bolt passing through each arm and its spools and means for securing the bolt.

In testimony whereof we affix our signatures in presence of two witnesses.

EDMUND D. REYNOLDS.
OLIVER B. REYNOLDS.

Witnesses:

WM. L. PUFFER,
M. E. KINGSLEY.