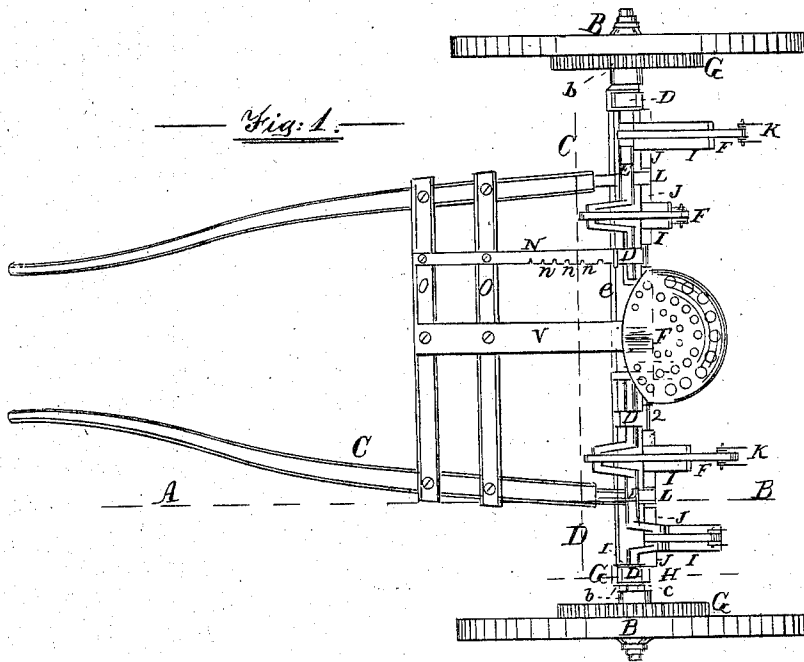
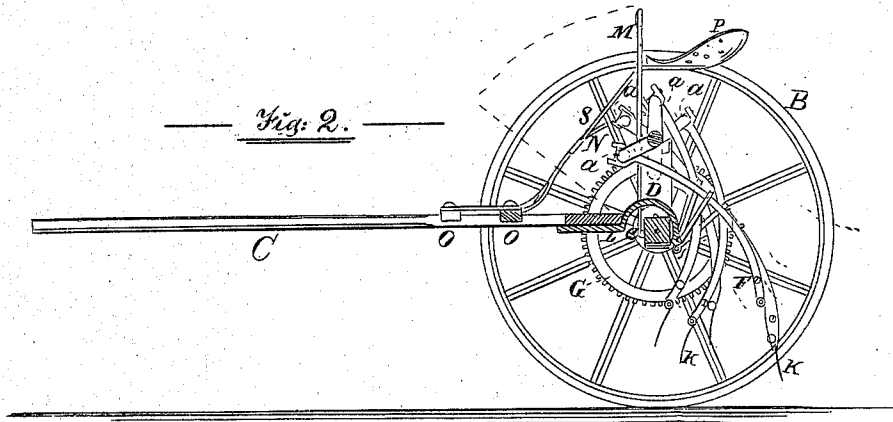


H. Warren.
Tedder.

2. Sheets, Sheet 1.

No. 104,669.

Patented June 21 1870.



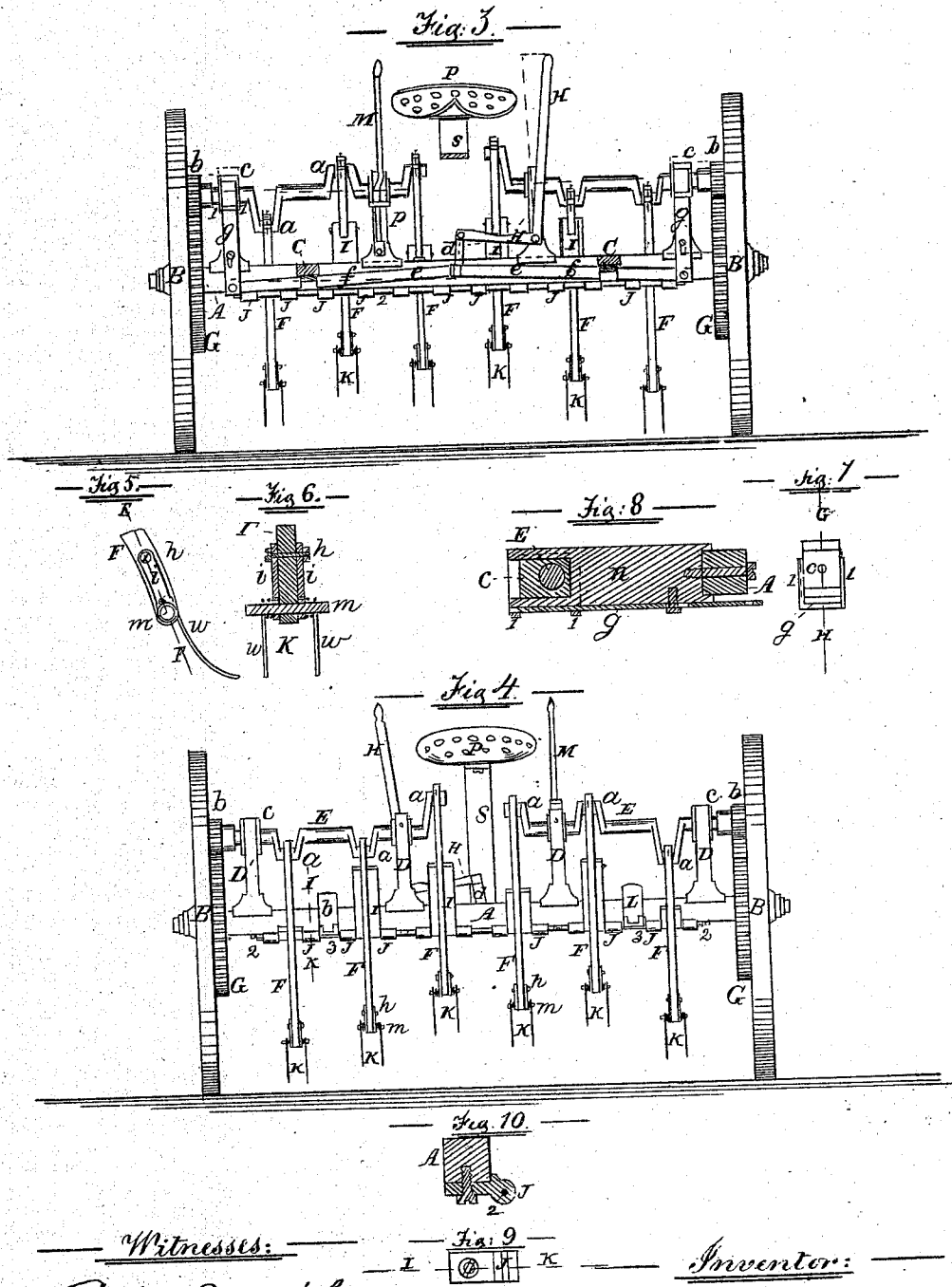
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HORACE WARREN, OF LEICESTER, MASSACHUSETTS.

Letters Patent No. 104,669, dated June 21, 1870.

IMPROVEMENT IN HAY-TEDDERS.

The Schedule referred to in these Letters Patent and making part of the same.

Know all men by these presents:

That I, HORACE WARREN, of Leicester, county of Worcester and Commonwealth of Massachusetts, have invented certain new and useful Improvements in Hay-Tedders or Machines for Spreading Hay; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing forming a part of this specification, in which—

Figure 1 represents a plan view of my improved hay-tedder.

Figure 2 represents a section on line A B, fig. 1.

Figure 3 represents a section on line O D, fig. 1.

Figure 4 represents a rear view of my improved tedder.

Figure 5 represents a side view of one of the spreading-forks.

Figure 6 represents a section of the spreading-fork on line E F, fig. 5.

Figure 7 represents a plan view of one of the standards which support the crank-shaft.

Figure 8 represents a central section of the said standard on the line G H, fig. 7, the standard being represented in a horizontal position.

Figure 9 represents a bottom view of the eye-pieces, by means of which the swinging arms are connected to the axle, and

Figure 10 represents a section of the axle and eye-piece, on line I K, fig. 9.

To enable those skilled in the art to which my invention belongs to make and use the same, I will proceed to describe it more in detail.

In the drawing—

A indicates the axle;

B, the wheels; and

C, the thills, arranged in the peculiar and relative positions shown.

Above the axle A, and supported thereon by the standards D D', are two shafts, E, on which are arranged several cranks, a, which operate the spreading-lever F.

The outer ends of the shafts E are provided with small gears, b, which mesh into large gears, G, fastened to the inner sides of the wheels B, from which the shafts E and spreading-levers F derive their motion.

The bearings, c, at the outer ends of the shafts E, are arranged in such a manner that they can be raised or depressed, to throw the shafts into or out of gear by the operation of the hand-lever H.

The lower end of the hand-lever H is bent, to form a bell-crank, H', and pivoted to one of the standards D.

The end of the bell-crank H' is connected, by the rod a, to the inner ends of two levers, e, that extend along the front side of the axle A, to which they are

pivoted, near their centers, by screws or bolts, f, and their outer ends are fastened to the upright slides, g, at the front side of the standards D'.

The slides g are furnished with forks, l, above and below the bearings c, which are moved up and down by the levers e, slots being formed in the top of the standards D, in which the bearings c are held.

The spreading-levers F are made, in this instance, in curved form, as shown in the drawing, their upper ends being attached to the cranks a, while their centers are pivoted or hinged to the ends of swinging-arms, I, and their lower ends furnished with spring forks, k.

The forward ends of the swinging-arms I are held between eye-pieces, J, fastened to the bottom of the axle A, said arms I being secured by a single rod, 2, that passes through the ends of all the arms I and eye-pieces J, as fully indicated in the drawing.

Instead of a single rod for fastening all the arms I, they may be fastened separately or in sections of two or more, as desired.

The forks K are constructed and fastened to the spreading-levers F in the manner shown in figs. 5 and 6.

Metallic plates, i are secured to each side of the lever F by a bolt, h, and passing through their lower ends, as well as through the end of the lever, is a pin, m, the ends of which project a short distance at each side.

The wires, w, that form the tines of the forks K are coiled to fit around the projecting ends of the pin m, thereby forming a spring to give the required amount of elasticity to the fork.

One end of the wire is bent to form a hook, which is inserted in a hole through the lower end of the plate i; the other projects downward, and is curved, to form the tine of the fork, all of which is fully indicated in the drawing.

The thills, C, have fastened to their rear ends metallic arches, L, that pass over the top of the axle A, and are secured at the back thereof in eye-pieces, 3, said eye-pieces 3 being bolted to the under side of the axle and projecting to the rear.

By this method of attaching the thills C to the axle A, the latter can be readily turned to adjust the height of the forks K from the ground, a hand-lever, M, being provided for the purpose.

The axle A, and parts attached thereto, are retained at the proper degree of elevation by means of a curved bar of metal, N, fastened to the cross-bars, O, and projecting upward and backward, as shown in fig. 2.

One edge of the bar N is furnished with a series of notches, n, and, by placing the lever M in the different notches, the different degrees of elevation are obtained.

A spring, *p*, is attached to the lever *M* to press it firmly into the notch *n*, and prevent it from working out of place when the machine is in motion.

A seat, *P*, is arranged for the operator upon a spring support, *S*, which is fastened to the cross-bars *O* of the thills *C*.

By having the plates *i* recessed or grooved out on their inner sides, the hooked end of the fork is retained in position, while, at the same time, it facilitates the insertion and removal of the hook of the fork.

In lieu of attaching the arm *N* to the cross-pieces of the shafts, I contemplate attaching the arm to the axle *A*, and have a catch-piece arranged upon the cross-piece.

By arranging the forks and their operating mechanism in the manner shown, a very compact machine is produced, while the draft is much less than the Bullard machine, upon which mine is an improvement. Then, again, by the combination of the thills with the axle, as shown, the operation of raising and lowering the forks is rendered quite easy and convenient.

It will be noticed that the weight of the rear ends of the shafts, as well as the weight of the driver, tends to bring the forks down toward the ground, while the action of the forks tends to roll the axle forward; the two forces thus, in a great measure, counterbalance each other.

Having described my improved hay-tedder,

What I claim therein as new and of my invention, and desire to secure by Letters Patent, is—

1. The combination and arrangement, with the main axle and crank-shafts placed vertically, or nearly

so, above said axle, of the spreading-fork levers, connected, at their upper ends, with the crank-shafts, and hinged, at a point intermediate between their two ends, to supporting arms, which, in turn, are hinged to the main axle, substantially as shown and described.

2. In combination with the main axle, crank-shafts, spreading-fork levers, and their hinged supporting arms, arranged as hereinbefore specified, the thills or shafts, when arranged so that their rear ends, or brackets, or straps, for supporting the same, shall be hinged to the rear side of the main axle, substantially as shown and described.

3. In a machine for spreading hay, the arrangement of the spreading-forks and mechanism for adjusting, operating, and supporting the same upon the main axle, which carries the driving-wheels, substantially in the manner shown and described.

4. The combination, with the crank-shafts, and their supporting standards, of the adjustable bearings *c*, and system of levers for operating the same, constructed and arranged upon the main axle, as herein shown and described.

5. The combination, with the fork-levers *F*, of the plates *i*, the pin *m*, passing through the lower end of said lever and plates, and the forks *w*, coiled around the projecting end of the pin, and having their hook ends held between the said lever and plates, in the manner shown and described.

HORACE WARREN.

Witnesses:

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