E. W. BULLARD. 2 Sheets—Sheet 1.

Hay-Tedders.

No. 207,010 Patented Aug. 13, 1878.

FIG. 1

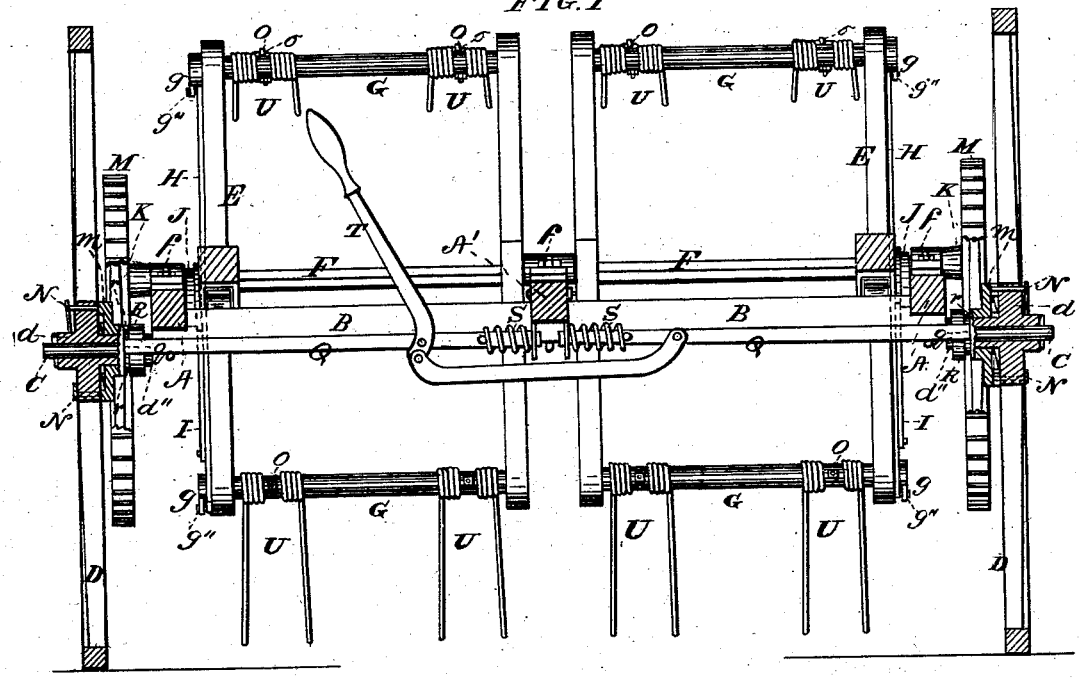
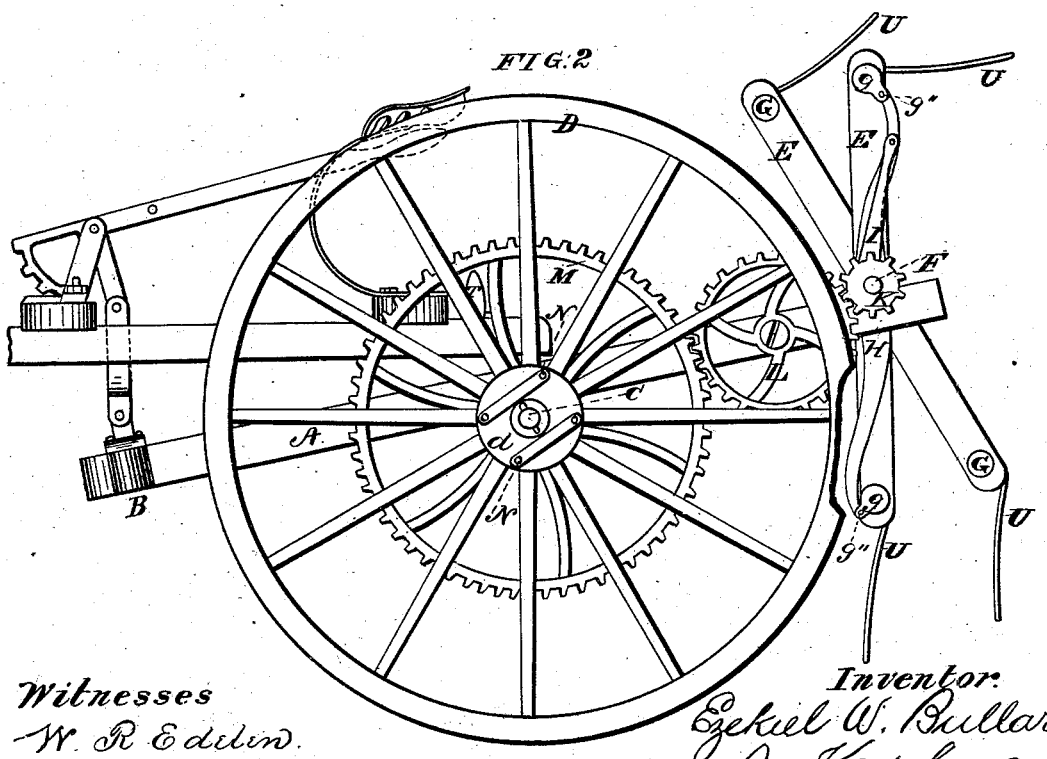


FIG. 2



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E. W. BULLARD.

2 Sheets—Sheet 2.

Hay-Tedders.

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FIG 3

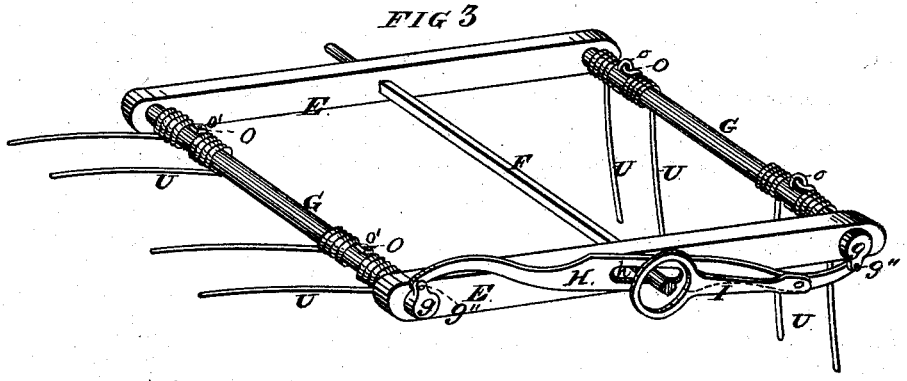


FIG. 4

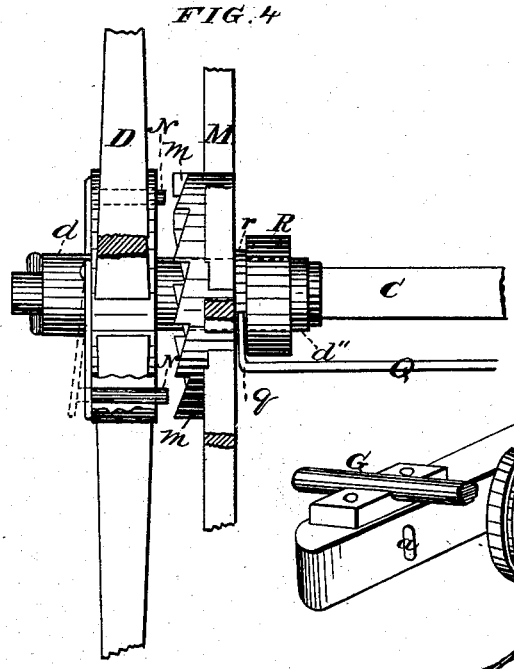


FIG. 6.

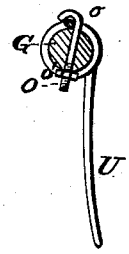
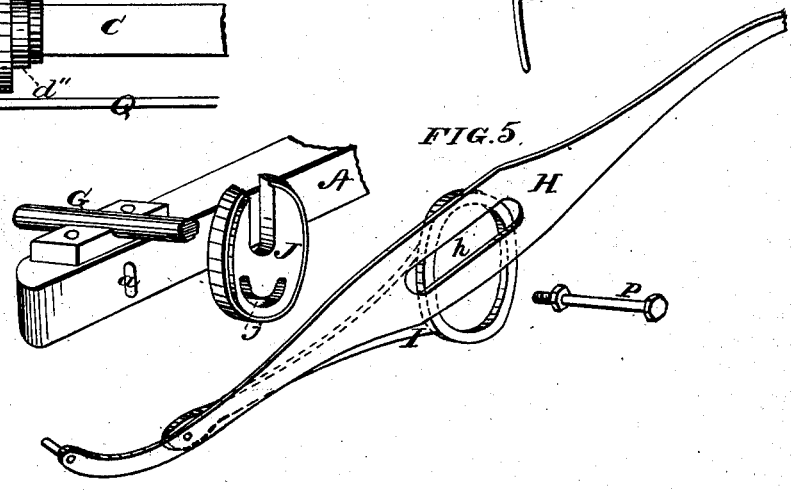


FIG. 5.



Witnesses
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UNITED STATES PATENT OFFICE.

EZEKIEL W. BULLARD, OF BARRE, MASSACHUSETTS.

IMPROVEMENT IN HAY-TEDDERS.

Specification forming part of Letters Patent No. **207,010**, dated August 13, 1878; application filed December 26, 1877.

To all whom it may concern:

Be it known that I, EZEKIEL W. BULLARD, of Barre, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Hay-Tedders, of which the following is a specification:

My improvement consists, first, in combining, with the tine-shafts and bar operating said shafts an eccentric-strap, the bar being intermediate of said shafts and strap.

By attaching the two tine-shafts to the same bar and using but one eccentric-strap to give the required movement of the tines, all increase of friction by the outward inclination of the tines is avoided, for the reason that one tine-shaft is a counter-balance to the other.

My improvement consists, secondly, in combining, with said tine-operating mechanism, a side beam having a vertical slot, an eccentric constructed with a curved slot, and a bolt for securing said eccentric in different positions on the side of said beam.

In the accompanying drawings, Figure 1 is a vertical transverse section of my improved hay-tedder. Fig. 2 is a side elevation, the tine-frames being elevated. Fig. 3 is a perspective view of my preferred form of tine-frame and connections to the eccentric. Fig. 4 is a rear view, on a larger scale, of my spring-pin clutch, some of the parts being broken away. Fig. 5 is a perspective view, on a larger scale, of my preferred form of device for connecting the tine-shafts to the operating mechanism, the various parts being detached to illustrate the device more clearly. Fig. 6 is a transverse section, on a larger scale, of a tine-shaft, showing the hooked bolt used for securing the tines.

A A A′ are the longitudinal beams, and B B the transverse bars, of the main frame of the machine. C is an axle rigidly secured beneath the central bar, B, of the frame by means of clips secured to the longitudinal beams of the frame. The axle C receives the driving-wheels D D. On the rear ends of the beams A A A′ are bearings *f f f* for two independent shafts, F F, carrying two frames, E E. G G G G are the tine-shafts, journaled in the frames E E, and provided with cranks *g g g g*, whose wrist-pins *g″ g″ g″ g″* are journaled in the ends of bars H H, which are, in turn, connected with straps I I, working on eccentrics J J, bolted to the outer beams, A A. The outer ends of the shafts F F pass through slots *h h* in the bars H H, and are provided with pinions K K, meshing with spur-wheels L L, rotated by cog-wheels M M, whose angular teeth *m m* are engaged by horizontally-acting spring-pins N N, secured to the hubs *d d* of the driving-wheels D D, and operating therethrough. The tine-shafts G G are provided with hooked bolts O O, whose hooks *o o* securely hold the loop in applying the tine wire or rods *v*, forming the forks. These bolts are secured by nuts *o′*. The rear end of each bar A A is provided with a vertical slot, *a*, for the reception of a bolt, P, by which the eccentric J is secured at any desired height. The eccentric is constructed with a curved slot, *j*, to permit sidewise adjustment.

The hubs of the driving-wheels are formed with projections *d″ d″*, forming bearings for the cog-wheels. The cog-wheels are adjusted laterally by means of sliding bars Q Q, whose hooked ends *q q* engage with collars R R, formed by constructing the hubs *r r* with annular grooves. The bars Q Q are forced outward by springs S S, and retracted by a lever, T.

Having thus described my invention, the following is what I claim as new and desire to secure by Letters Patent:

1. The combination of eccentric-strap I, tine-shafts G G, and a bar, H, intermediate of said strap and tine-shafts, as set forth.

2. The combination, with the eccentric-strap, intermediate bar, and tine-shafts, of the eccentric J, having curved slot *j*, and beam A, having slot *a*, as and for the purpose set forth.

EZEKIEL W. BULLARD.

Witnesses:
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FREDK. W. JENKINS.