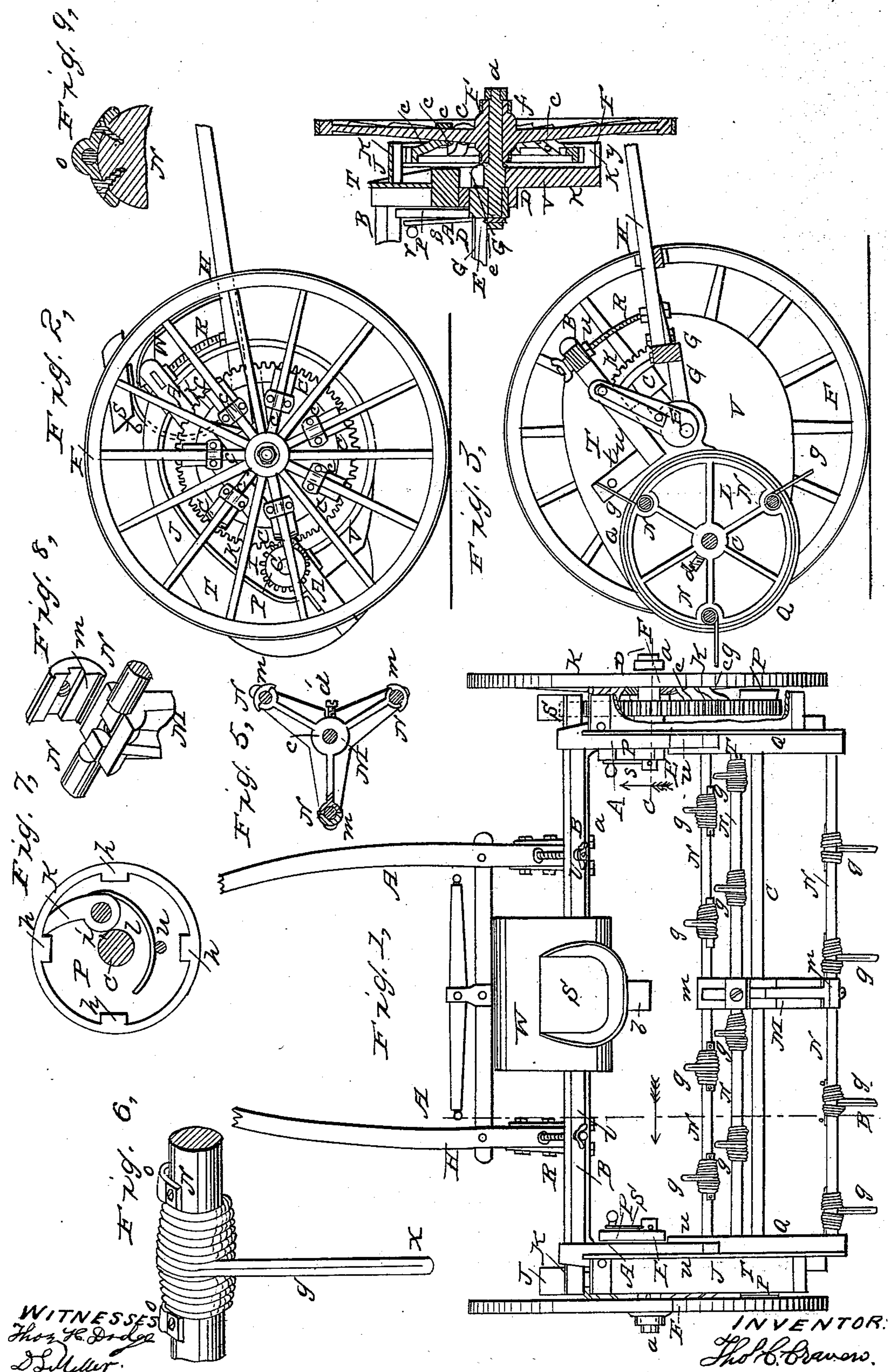


## Hay Spreader.

Patented Dec. 8, 1868.





# United States Patent Office.

THOMAS C. CRAVEN, OF ALBANY, NEW YORK.

Letters Patent No. 84,800, dated December 8, 1868.

## IMPROVEMENT IN HAY-SPREADERS.

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

*Know all men by these presents:*

That I, THOMAS C. CRAVEN, of Albany, in the county of Albany, and State of New York, have invented certain new and useful Improvements in Hay-Tedders; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

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

Figure 2 represents a side view of the same;

Figure 3 represents a section on line A B, fig. 1;

Figure 4 represents a section through the wheel and axle, on line C D, fig. 1;

Figure 5 represents a view of the three-armed central support, for the bars of the reel; the end of one arm is shown in section;

Figure 6 represents a perspective view of one of the spring-teeth, showing the manner of fastening them to the bars of the reel;

Figure 7 represents a view of the ratchet-device;

Figure 8 represents a perspective view of the end of one of the arms which support the bars at the centre of the reel, showing the cap removed and the bars placed in position; and

Figure 9 represents the section of the clasp for fastening the teeth to the bars of the reel.

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.

The frame of my improved hay-tedder is composed of two side-rails A A, joined at their forward ends by a cross-piece, B, and near their rear ends is placed shaft C of the reel, extending from one to the other, parallel to the cross-piece B.

To the lower side of the rails A, near their centres, are fastened metallic bearings D, and through said bearings pass eccentrics E', which are hung and swing upon the inner ends of the axles E.

A short axle is used at each side of the machine, instead of one extending from side to side.

The axles are formed by turning trees or journals *e* at their inner ends, upon which work the eccentrics E', and at their outer ends trees or journals *f*, upon which are placed the wheels F.

The two axles are joined to each other by a metallic bar, G, which extends across from side to side at the front of the machine, with the ends turned back and welded to the axles E, between the trees or journals *e* and *f*.

On the top of bar G is bolted the transom G', to which the thills H, or pole, are fastened.

The wheels F are constructed like the wheels commonly used on light carriages, and are secured upon the axle in the usual manner by nuts *a*.

At the inner sides of the wheels are gears K, which mesh into the pinions I upon the ends of the reel-shaft C. The gears K are secured to the spokes of the wheels

F, by means of short arms or projections *c*, fastened to the rims of the gears K, and having in their ends grooves or channels that fit the spokes at the inner sides of the wheels, where they are held by caps *c'*, fitted in like manner to the outer sides of the spokes, and clamped firmly to the arms by screws or bolts, as fully indicated in the drawings.

Across the rear of the frame is placed the reel, the construction being as follows:

Upon the shaft C, at the inner sides of the rails A, are placed circular heads or disks L, secured to the shaft C by screws *d*. These heads or disks L are of metal, and are cast with strengthening-arms and rims, having near the latter sockets to receive the ends of the bars N.

Midway between the heads L, upon the shaft C, is placed, and secured thereto by a screw, *d'*, a three-armed support, M, from which, to the heads L, extend wooden bars N, having upon them the spring-teeth *g* that stir the hay.

The ends of the bars N are flattened at one side, as shown in the drawings, fig. 8, and are secured to the heads L by being inserted into the sockets made near the circumference, which correspond in form to the ends of the bars.

The bars N are secured to the central support M by being fitted into grooves formed in the ends of the arms for that purpose, where they are held by caps *m*, which rest on their flattened sides, and which are fastened to the arms by a single screw or bolt in each, passing through the cap *m* into the end of the arm, between the ends of the bars N, as shown in the drawings.

The teeth *g* are formed of wire, which is doubled and the ends coiled around the bars N, forming a conical-shaped spring, as shown in the drawings, fig. 6, the coils of the spring diminishing in circumference as they recede from the tooth. The ends of the wires are bent outward, and pass under clasps O, that are screwed bolted to the bars N of the reel, and by means of which the teeth *g* are held in place. Owing to the peculiar form of the spring, when the tooth *g* is pressed back, the coil farthest from the tooth is first to close on the bar N, thereby utilizing the full amount of elasticity of each coil. This would not be the case were all the coils of the same size, as, in such case, the coil nearest the tooth would be the first to close upon the bar, thereby preventing the free action of the remaining coils.

Thus it will be seen that with the conical-coiled springs the teeth will withstand more pressure and rougher usage, without being damaged, than they would were the coils of the springs of equal circumference.

The shaft *c* of the reel is supported upon the side-rails A by means of suitable bearings, and the pinions I are placed upon the shaft *c*, just outside the rails A,



working loosely on said shaft, the latter being turned by means of a ratchet-device, the construction of which is shown in the drawings, fig. 7.

To the ends of the shafts *c*, outside the pinions *I*, are fastened metallic cups *P*, having upon the inner sides of their rims four lugs or projections *h*, and, pivoted to the outer sides of the pinions *I* by pins *i*, are pawls *k*, which work inside the cups *P*.

To the backs of the pawls *k* are fastened flat springs *l*, which are curved and rest against pins *n*, fixed in the sides of pinions *I*.

By means of the springs *l*, when the wheels *F* are moved forward, the pawl *k* is caused to engage with the lugs *h* on the inner side of the rims of the cups, thereby turning the shaft *c* and operating the reel, but when the wheels are moved backward, the pawls *k* pass by the lugs, and the shaft is not acted upon.

Circular guards or hoops *Q* are fastened to the bearings *D* and side-rails *A*, which surround the heads or disks *L* of the reel, thereby preventing any hay or other substance from being driven in and wound round the shaft between the heads and bearings.

The eccentrics *E'* have arms *p* attached to them, by which they are operated to throw the reel into and out of gear.

Springs *s* are fastened to the arms *p* of the eccentrics, having at their ends pins *r*, which pass through the ends of the arms *p* into holes formed in the inner sides of the side-rails *A*, and by means of which the eccentrics are held in position when the reel is thrown into gear, as shown in the drawings. By moving the arms back, the reel is thrown out of gear, where it is held by placing the pin *r* in holes *t*, formed in the block *u*, extending up from the rails *A*.

The height of the reel from the ground can be regulated by means of screws *R* fixed to the thills *H*, extending upward and passing through the cross-piece *B*, where they are made adjustable with nuts *v* and *v'*. In lieu of screws *R*, flat strips or rods of metal may be used, having upon them slides attached to the frame, which can be adjusted by movable pins passed through holes in the rods and slides.

Boards *T*, upon the top of the side-rails *A*, and boards *V*, at their under sides, form partitions to prevent the hay from being blown or carried against the wheels, and guides *J* and *J'* are arranged above and below the gears *K* and *I*, to prevent any hay or other substance being caught in the gearing.

A seat, *S*, for the driver is placed above the cross-bar *G'*, being attached thereto, and supported at a convenient height by a spring, *b*.

Extending upward from the cross-bar of the thills, and curved back beneath the seat *S*, is an apron or guard, *W*, which may be made of metal or any other suitable material, to prevent the ends of the reins, or any part of the driver's clothing, from being caught, either by the teeth of the tedder or by any projection upon the ground, and also to prevent stones or other hard substances from being thrown against the driver's limbs.

The cross-piece *B* of the frame may be dispensed with, if preferred, and the screws *R*, or regulating-device, be placed at the ends of the side-rails *A*, with their lower ends fixed to parts of the frame beneath.

The guards *G*, *J*, and *J'*, and the boards *T* and *V*, may be used together, or either may be used separately, if desired.

The guard or shield *W* may be attached in a different manner from that above described, and still answer the same purpose.

The operation of my improved hay-tedder is as follows:

The horse being hitched into the thills, the driver takes his place upon the seat *S*; the arms *p* of the eccentrics *E'* are brought forward, and held by pins *r* to the rails *A*, as shown in the drawing, whereby the reel is thrown into gear; then, as the machine is drawn forward, the reel is caused to revolve rapidly in a direction opposite to the movement of the wheels *F*. By the motion of the reel the hay is taken from the ground, carried over the top of the reel, and thrown back of the machine, being, by the operation, well shaken and turned.

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, with the ends of the central support *M* and caps *m*, of the bars *N*, substantially as and for the purpose set forth.
2. The combination of the bars *N*, having irregular-shaped ends, with the heads or disks *L* and central support *M*, substantially as and for the purposes set forth.
3. The combination of the caps *m* with the central support *M*, substantially as and for the purposes set forth.
4. The combination, with the frame or bearings which support the reel-shaft, of the eccentrics *E'*, substantially as and for the purposes set forth.
5. The combination, with the eccentrics *E'* and side-rail, *A*, or their equivalents, of the arms *p*, springs *s*, and pins *r*, substantially as and for the purposes set forth.
6. The combination of the driving-gears *K* with the wheels *F*, substantially as and for the purposes set forth.
7. The combination, with the frame which supports the reel and the frame which connects the journals of the wheels *F*, of adjusting-screw *R* and nuts *v v'*, substantially as and for the purposes set forth.
8. The combination, with the frame of the machine and the driver's seat, of a metallic or other suitable guard or shield, *W*, arranged substantially as and for the purposes set forth.
9. The combination, in a hay-tedder, of a triangular or three-barred reel, with caps *m*, constructed substantially as shown and described.

THOS. C. CRAVEN.

Witnesses:

THOS. H. DODGE,  
D. L. MILLER.