3 Sheets—Sheet 1.

D. A. CALKINS.

Horse Hay-Rake.

No. 210,093. **Patented Nov. 19, 1878.**

Fig. 1.

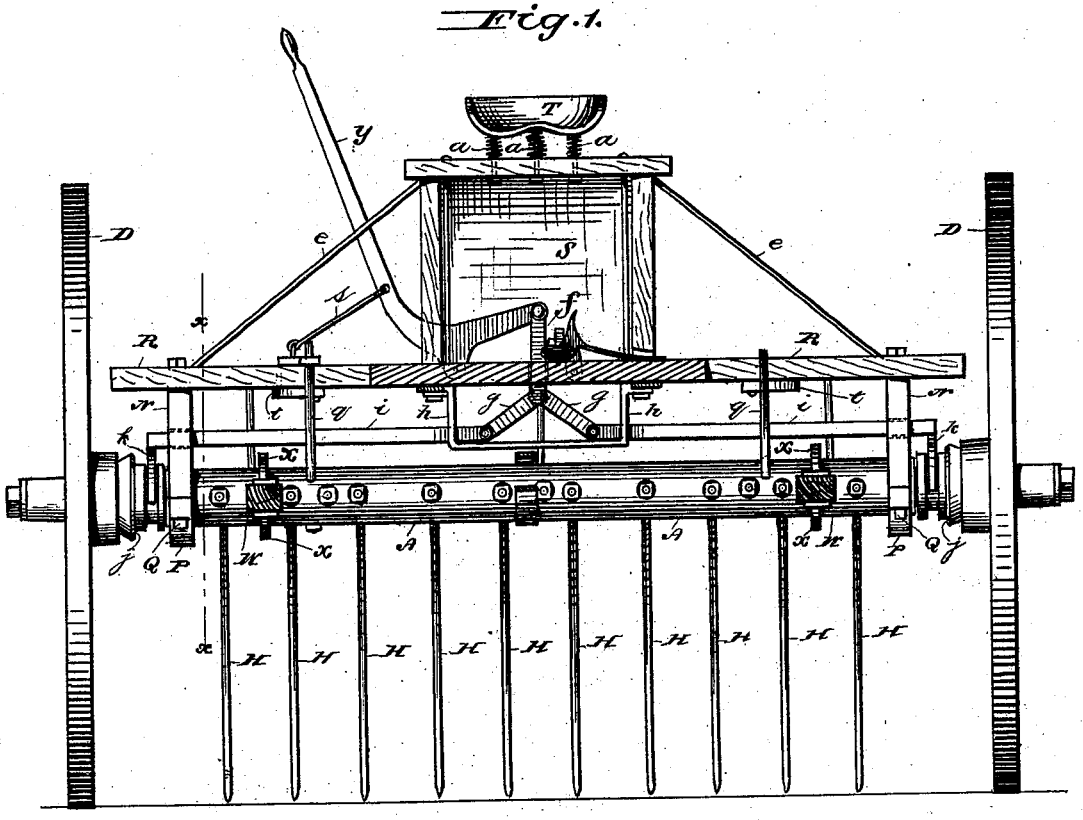
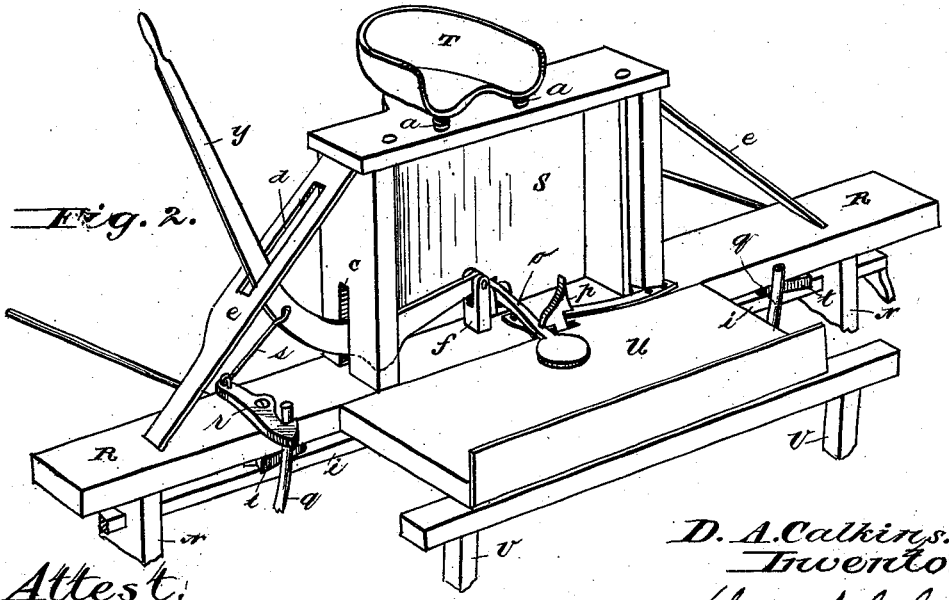


Fig. 2.



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3 Sheets—Sheet 2.

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Horse Hay-Rake.

No. 210,093. Patented Nov. 19, 1878.

Fig. 3.

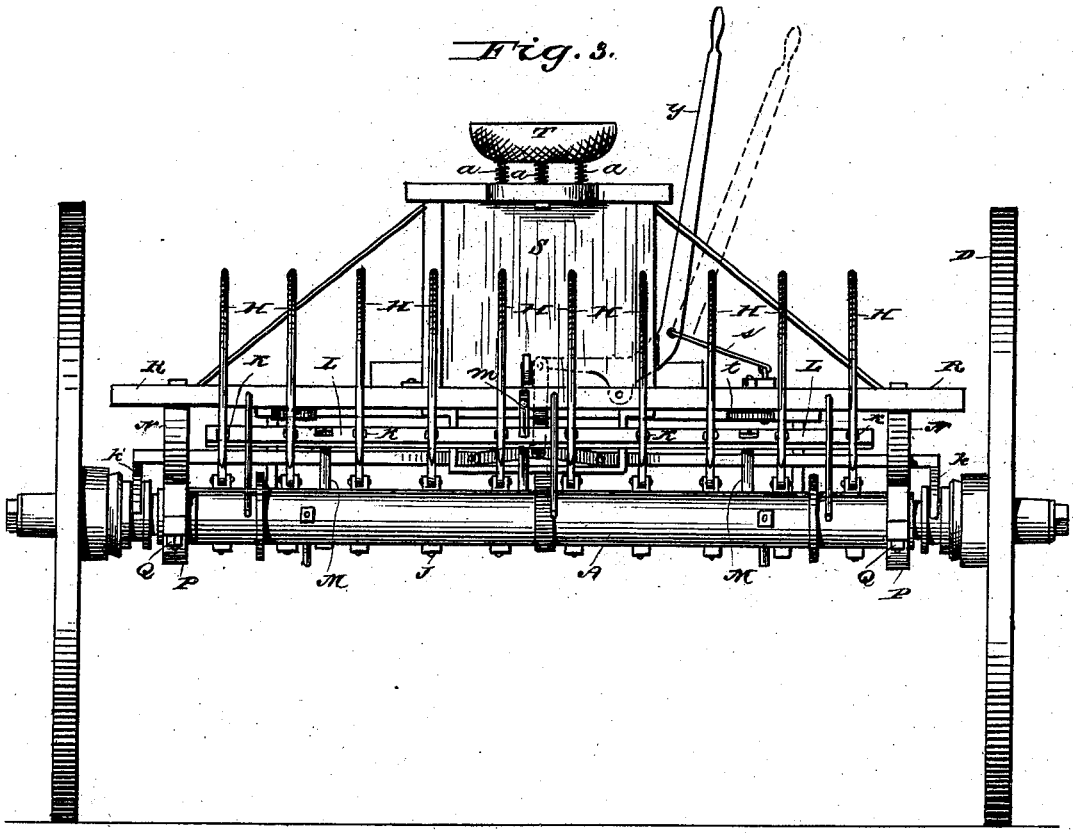


Fig. 4.

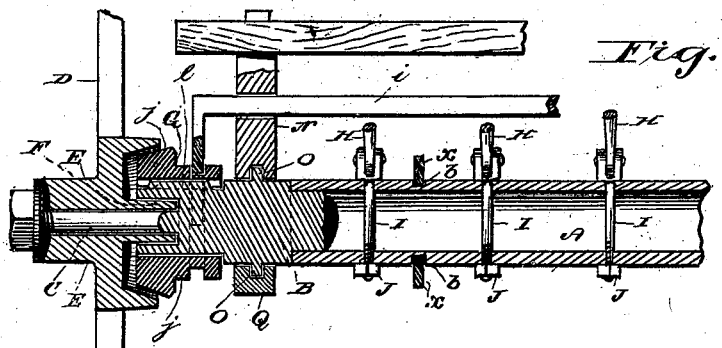
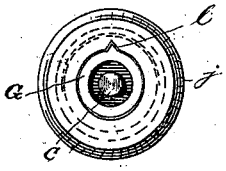


Fig. 5.



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Horse Hay-Rake.

No. 210,093 Patented Nov. 19, 1878.

Fig. 6.

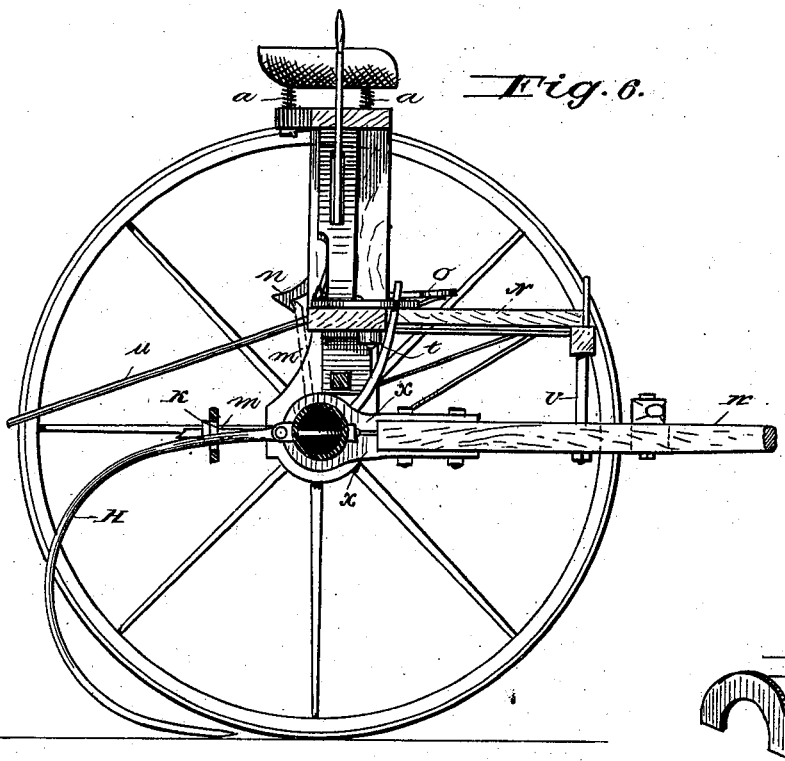


Fig. 8.

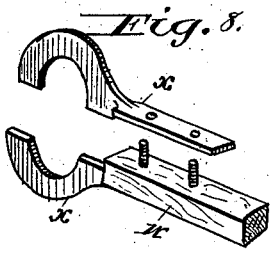
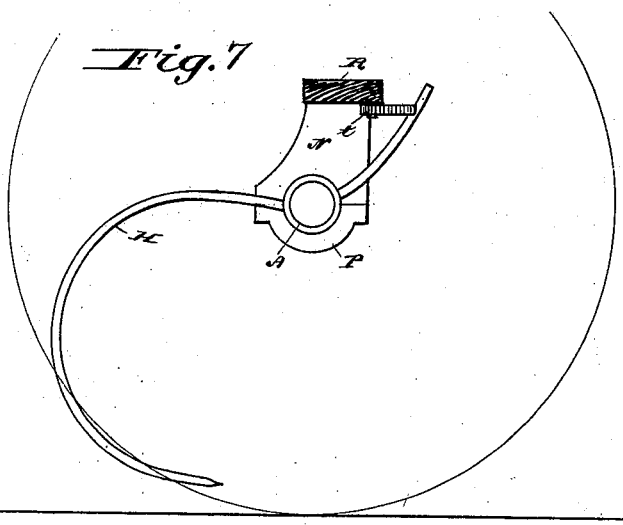


Fig. 7



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UNITED STATES PATENT OFFICE.

DICKERSON A. CALKINS, OF MONSON, MASSACHUSETTS.

IMPROVEMENT IN HORSE HAY-RAKES.

Specification forming part of Letters Patent No. **210,093**, dated November 19, 1878; application filed September 28, 1878.

To all whom it may concern:

Be it known that I, DICKERSON A. CALKINS, of Monson, in the county of Hampden and State of Massachusetts, have invented certain new and useful Improvements in Horse Hay-Rakes; and I do hereby declare that the following is a full, clear, and exact description thereof.

This invention relates to certain improvements in horse hay-rakes; and the invention consists in the construction and arrangement of parts, which will be hereinafter more fully set forth.

In order to enable others skilled in the art to which my invention appertains to make, construct, and use the same, I will now proceed to describe its construction and operation, reference being had to the accompanying drawing, which forms a part of this specification, and in which—

Figure 1 is a front view with the shafts removed. Fig. 2 is a perspective view with the wheels and teeth-carrier removed. Fig. 3 is a back view with the teeth raised. Fig. 4 is a section through one of the friction-clutches, wheel-hubs, and teeth-carriers. Fig. 5 is a front view of one of the friction-clutches. Fig. 6 is a section taken on line *x x* of Fig. 1. Fig. 7 is a view showing the teeth held just above the ground by the button arranged under the cross-frame, and Fig. 8 is a view showing one of the clutches that connect the shafts to the rake-head.

In the drawing, A denotes the rake-head. This rake-head is formed with solid ends B, (shown in Fig. 4 of drawing,) having spindles C, upon which the wheels D are arranged.

The hubs E are formed with projecting boxes F, which pass into a recess formed by the spindle C and flange G of the solid end of the rake-head.

The teeth H are loosely pivoted to bolts I, (shown in Figs. 3 and 4 of drawing,) passing through the rake-head A and secured by nuts J. The teeth pass through slots K (shown in Fig. 6 of drawing) in the bar L, which is held by stiff arms M, extending out from the rake-head A, as shown in Figs. 3 and 6 of drawing.

The slots K are vertically elongated in order to allow an upward movement of the teeth when caught or obstructed by some impediment.

Upon each end B of the rake-head is arranged a standard, N, constructed to receive a standard, O, (shown in Fig. 4 of drawing,) the lower end, P, of said standard N being held by screws or bolts Q, as shown in Figs. 1 and 3 of drawing. These standards N support a cross-frame, R, upon which is centrally arranged a seat-box, S, having the seat T supported thereon by coil-springs *a*, as shown. The cross-frame is also provided with a foot-board, U, extending out in front of the seat-box S, as shown in Figs. 2 and 6 of drawing, the forward end of the foot-board U being supported by standards V, extending up from the shafts W, as shown in Fig. 6 of drawing.

The shafts W are secured to the rake-head A by spanning-irons X, arranged in a circumferential groove, *b*. (Shown in Fig. 4 of drawing.) These spanning-irons X are secured to the ends of the shafts W by screws or bolts, as shown in Fig. 8 of drawing.

To the cross-frame R, under the seat-box S, and near one side thereof, is fulcrumed a lever, Y, the long end of which passes through a slot, *c*, in the side of the seat-box S, and a slot, *d*, in one of the seat-box braces *e*, as shown in Fig. 2 of drawing. The short end of the lever under the seat-box connects with a vertical arm, *f*, (shown in Fig. 1 of drawing,) extending up from a toggle-joint, *g*, supported by the frame *h* under the cross-frame R, as plainly shown in Fig. 1 of drawing. To the lower ends of the two arms of the toggle-joints is secured one end of two horizontally-arranged arms, *i*, extending in opposite directions to the friction-clutches *j*, arranged on the solid ends B of the rake-head A, as shown in Fig. 4 of drawing. The arms *i* are connected with the friction-clutches by spanning-arms *k*, as shown in Figs. 1 and 3 of drawing. The friction-clutches *j* are held and allowed to slide, but prevented from turning on the solid end B, by a rib, *l*, as shown in Fig. 4 of drawing. To the rake-head A is secured an arm, *m*, which, when the teeth are elevated, engages and is held by the projecting end *n* (shown in Fig. 6 of drawing) of the spring-catch *o*, arranged under the seat-box S, as plainly shown

in Fig. 2 of drawing. This catch *o* may be locked down when desired, to prevent it from interfering with the movement of the rake-head A by a spring-lock, *p*, (shown in Figs. 1 and 2 of drawing,) when it is desired to elevate and lower the teeth by the lever Y. The teeth are held down in position, when it is desired to rake, by an arm, *q*, extending up from the rake-head A, as shown in Fig. 1 of drawing, which engages with the hook *r*, pivoted to the cross-frame R. The hook *r* is operated by a rod, *s*, extending from the lever Y, as plainly shown in Fig. 2 of drawing.

In some cases it is desired to carry the teeth just free of the ground while raking. This may be accomplished by the buttons *t*, secured to the under side of the cross-frame R. When such elevation of the teeth is required, the buttons *t* are turned out and engaged with the arms *q*, as shown in Fig. 7 of drawing.

The teeth are operated in the following manner: When it is desired to elevate the teeth in order to drop the accumulated hay thereon, the lever Y is pulled toward the seat. By this movement of the lever the friction-clutches are, by means of the toggle-joint and horizontal arms, shoved out and made to engage with the hub of the wheels, which, as they revolve on the forward movement, turn the friction-clutches, which, in turn, revolve the rake-head until the teeth are elevated to their highest point.

If it is desired to carry the teeth elevated, the catch *o* is disengaged from the lock *p*, and thereby allowed to spring its projecting end *n* down on the arm *m*, as shown in dotted lines of Fig. 6 of drawing.

When it is desired to lower the teeth for gathering the hay, the friction-clutches are disengaged by shoving the lever from the seat. This movement allows the teeth to drop down in position, when the arm *q* is caught by the hook *r*, which rigidly holds the teeth while gathering the hay.

The arms *u*, (shown in Fig. 6 of drawing,) extending backwardly from the cross-frame, shove the hay from or off of the teeth when they are elevated.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of the lever Y, rod *s*, and pivoted hook *r* with the arm *q* and rake-head A, as set forth.

2. The combination of the catch *o*, lock *p*, arm *m*, and rake-head A, as set forth.

3. The combination of the buttons *t*, arms *q*, and rake-head A, as set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

DICKERSON A. CALKINS.

Witnesses:
IRA G. POTTER,
ARVILLA J. PECK.