(No Model.) 2 Sheets—Sheet 1.

H. H. HAGERMAN.

Horse Hay Rake.

No. 236,578. **Patented Jan. 11, 1881.**

Fig. 1.

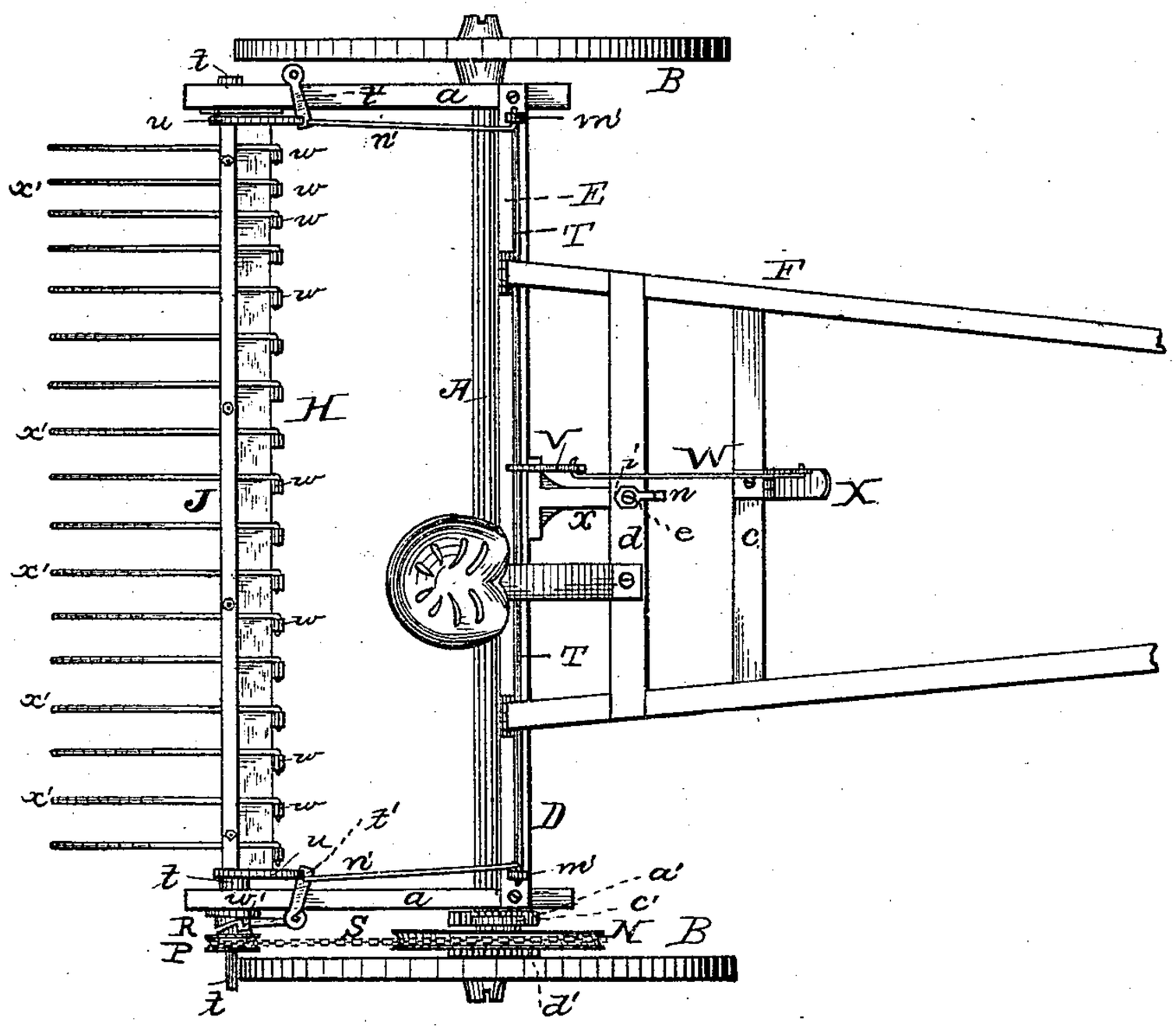


Fig. 2.

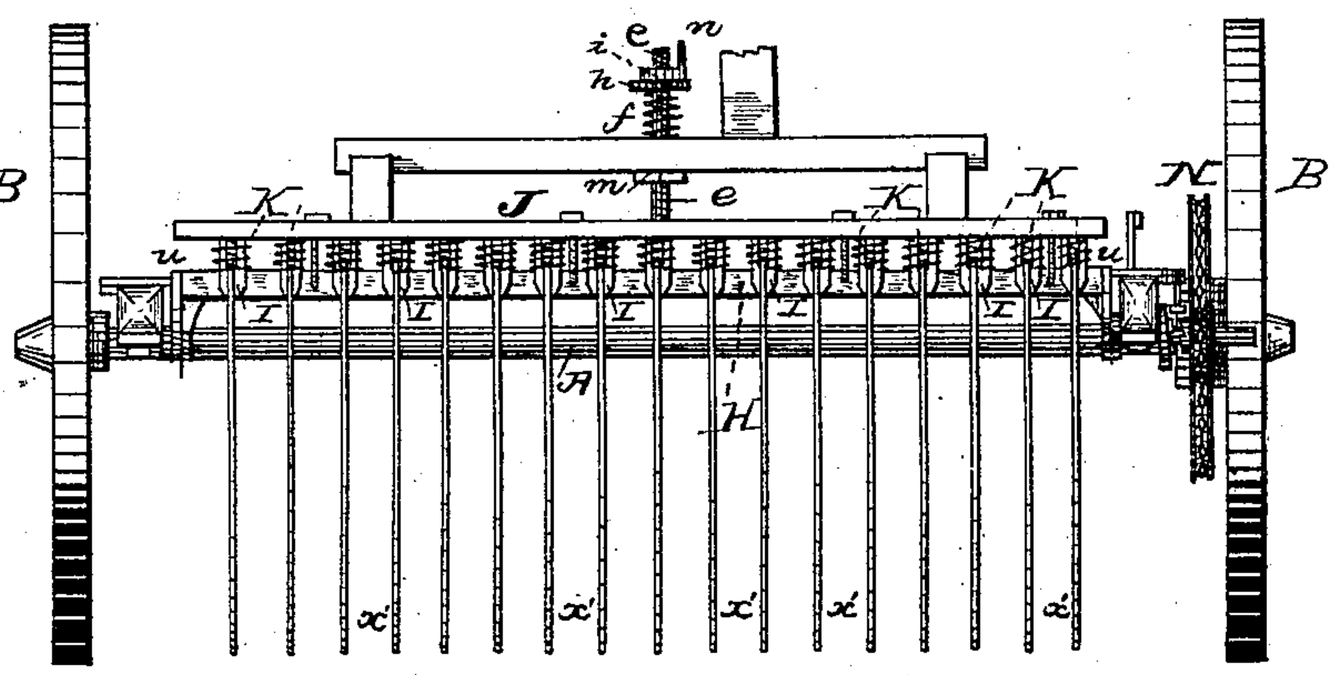


Fig. 3.

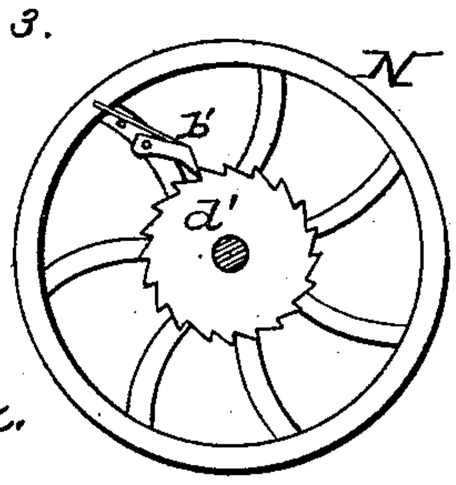
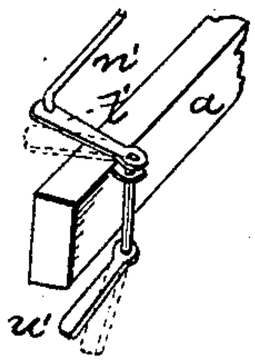


Fig. 4.



Witnesses;
Chas. C. Gill
Wm. M. Reilly.

Inventor;
H. H. Hagerman,
By his Attys.
Cox and Cox

(No Model.) 2 Sheets—Sheet 2.

H. H. HAGERMAN.

Horse Hay Rake.

No. 236,578. Patented Jan. 11, 1881.

Fig. 5.

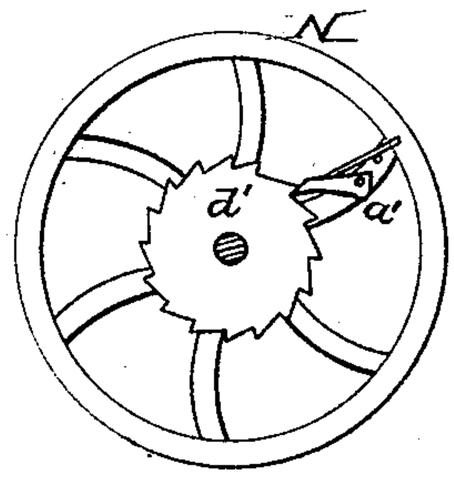


Fig. 6.

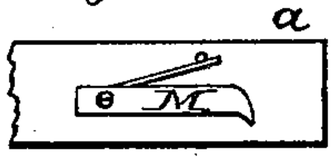
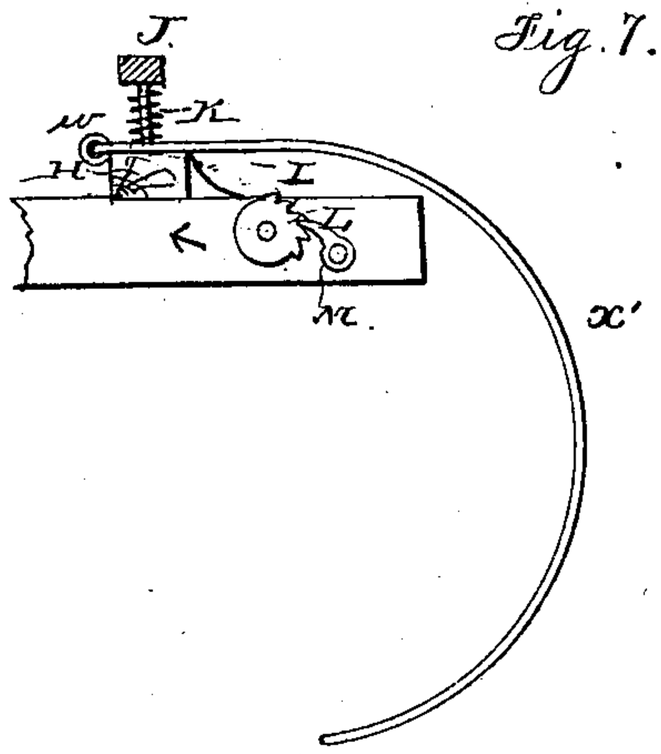


Fig. 7.



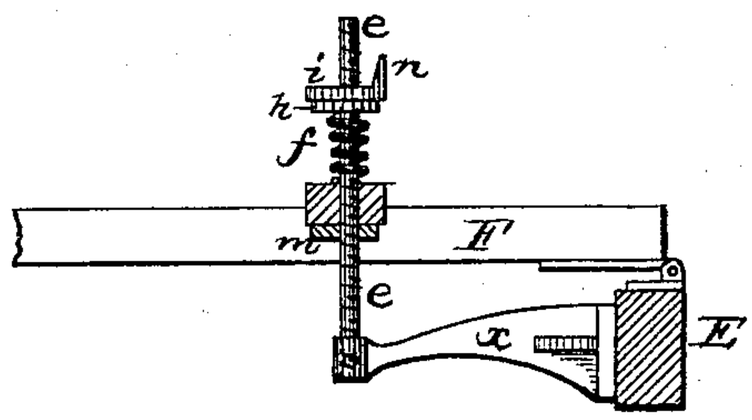


Fig. 8.

Witnesses;
Chas. C. Gill
Wm. M. Reilly.

Inventor;
H. H. Hagerman
By his Attys,
Cox and Cox

UNITED STATES PATENT OFFICE.

HAMLINE H. HAGERMAN, OF WEST WINDSOR, OHIO.

HORSE HAY-RAKE.

SPECIFICATION forming part of Letters Patent No. 236,578, dated January 11, 1881.

Application filed July 2, 1880. (No model.)

To all whom it may concern:

Be it known that I, HAMLINE H. HAGERMAN, of West Windsor, in the county of Richland and State of Ohio, have invented a new and useful Improvement in Hay-Rakes, of which the following is a specification, reference being had to the accompanying drawings.

The invention relates to an improvement in horse hay-rakes; and it consists in the elements hereinafter fully described, and particularly pointed out in the claims.

The object of the invention is to provide a revolving horse-rake having spring attachments and capable of being revolved by power from the axle of the carriage, subject to the control of the operator.

Referring to the accompanying drawings, Figure 1 is a top view of a rake embodying the elements of the invention. Fig. 2 is a plan view, from the rear, of same. Figs. 3 and 5 are plan views of the obverse and reverse sides of the wheel N. The remaining figures are detached views of the parts indicated by letter hereinafter.

A indicates the main axle, and B the supporting-wheels.

D indicates the carriage, consisting of the sides *a*, mounted at their front portions upon the axle A, and the cross-bar E, connecting the said sides directly in front of the axle.

Upon the upper surface of the bar E are hinged the shafts F, which extend forward a suitable distance, and are connected at their rear by the cross-bars *c d*.

Upon the face of the bar E, preferably at its center, is secured the hanger *x*, which passes forward beneath the cross-bar *d*, and has pivoted in its bifurcated end the lower end of the threaded bolt *e*, extending vertically upward through an aperture in the bar *d*, being provided beneath the same with a nut, *m*, and directly above the same with a spiral spring, *f*, then a washer, *h*, and lastly with a nut, *i*. The nuts *m i* will preferably be of such form that they may be readily operated by hand, the nut *i* being, by preference, formed with a horizontal crank-handle, *n*, by which it may be rotated.

Between the rear ends of the sides *a* is mounted upon short axles *t* the rake head or bar H. The axles *t* are journaled in suitable boxes provided for them, and enter the metallic bushings *u*, secured on the ends of the rake-bar H, whereby the said bar is retained in place and made capable of revolution.

Upon the front edge of the bar H are secured, at equal distances from each other, the horizontal sleeves *w*, in which are inserted the front ends of the rake-teeth *x'*, said ends being bent at an angle, so as to enter the sleeves and permit the rear portions of the teeth, which curve rearward and downward, to have a vertical oscillating movement and to adapt themselves to any unevenness in the surface of the ground.

Upon the rear edge of the bar H are secured, at points opposite to the sleeves *w*, the vertical guides I, through which the teeth *x'* pass as they extend rearward from the sleeves. The upper ends of the guides I enter or are in close contact with the bar J, adjustably secured by bolts across their upper ends. Around the guides I, between the teeth *x'* and the bar J, are placed the coiled springs K, the tension of which retains the teeth in proper position, but permits them at the same time to have a slight vertical springing movement when in use. Upon the removal of the bar J any of the teeth may be detached and replaced at will. The bar H will be secured a sufficient distance in rear of the axle A to allow the teeth *x'* to sweep clear of the latter when revolved.

At the left-hand end of the bar H, upon the short axle *t*, is secured the ratchet L, and upon the side *a* adjacent to it the spring-pawl M, which engages the ratchet L and operates to prevent the rake-bar moving on the axles *t* in a direction contrary to that indicated by the arrow. If it were not for the pawl and ratchet, the bar H, when the rear portion of the frame D is elevated to pass over a stone or other obstruction, would tilt rearward, and thereby throw the points of the teeth *x'* upward under the carriage, out of position. The use of the said pawl and ratchet effectually avoids this.

Upon the right-hand end of the axle A is mounted the band or chain wheel N, carrying upon one side the right pawl *a'* and upon the other the left pawl *b'*, the former of which engages the ratchet-wheel *c'*, rigidly secured upon the axle A between the wheel N and the side *a*, while the pawl *b'* engages the ratchet *d'*, secured upon the inner face of the hub of the

wheel B. The purpose of this arrangement is, that when the machine is traveling forward, the movement of the wheel B will be communicated to the wheel N, and when traveling backward that the wheel N shall not be affected by the movement of either the wheel B or axle A.

Upon the short axle *t*, at the right of the machine, and on the outside of the bar *a*, is mounted so as to freely revolve thereon the band or chain wheel P, which is directly opposite to the larger wheel N, and has formed upon its inner face one half of the clutch-box R. The other half of the clutch-box R is rigidly secured to the axle *t* and rotates with it. A chain or band, S, connects the wheels N P, so as to communicate motion from one to the other.

Across the front part of the machine, extending along the front bar, E, is journaled the rock-shaft T, upon the middle portions of which is secured the arm V, extending upward, and connected by a rod, W, with a foot-piece, X, hinged to the bar *c*.

Upon the ends of the shaft T are attached the vertical arms *m'*, having affixed in their upper ends the rods *n'*, which pass rearward over the sides *a* and connect with the arms *t'*, pivotally secured on the outer edges of the sides *a*, as shown with sufficient accuracy in Fig. 1.

Upon the lower end of the pivot securing the arm *t'*, on the left-hand side of the machine, is secured an arm, *w'*, which extends rearward between the side of the wheel P and the face of the cam *w'*, formed on the face of the inner half of the clutch-box R.

When it is desired to operate the machine the shaft T is turned slightly toward the rear, so that the ends of the arms *t'* will be below the front edges of the ends of the bar H and prevent the rake turning, the rake being then in proper position to gather the hay. When the arms *t'* are moved rearward the arm *w'* is by the same movement forced outward, which disengages the halves of the clutch-box R, causing the wheel P to run idly upon the axle *t*. The rake being set in position, as aforesaid, by the arms *t'*, the machine is drawn forward, when the teeth *x'* will gather the hay. During this movement the motion of the wheels B is communicated to the wheel N, and thence, through the chain or band S, to the wheel P, which at this period, as aforesaid, runs idly upon the axle *t*. After a sufficient quantity of hay has been gathered the driver presses upon the foot-piece X, which operates to draw the arms *t'* from beneath the bar H and to remove the arm *u'* from contact with the wheel P, which movement permits the halves of the clutch-box R to come together, whereby the motion of the wheels B is communicated, through the wheel N, chain S, and wheel P, to the axles *t* and bar H, causing them and the teeth *x'* to revolve toward the front, dropping the hay gathered in a bundle. At the end of each revolution of the rake-bar and teeth the arm *w'* is forced outward against the wheel P by the cam *w'* coming in contact with it, disengaging the clutch R, and throwing the arms *t'* beneath the rake-bar H, whereby the teeth *x'* are again held in position to gather hay. This operation may be continued as long as desired, until all the hay has been gathered and deposited in heaps.

By rotating the nuts *m i* either to the right or left the rear of the carriage-frame may be tilted either upward or downward, and the points of the teeth *x'* thereby adjusted at will with relation to the ground.

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

1. In a hay-rake, the hanger *x* and pivotally-secured bolt *e*, passing upward through the bar *d*, and provided with nuts *m i* and spring *f*, for the purpose of adjusting the rake-teeth with relation to the ground, substantially as specified.

2. In combination with a revolving rake-head, the clutch-box R, wheels N P, connected by a chain or belt, cam *w'*, arm *u'*, and a means for operating the said arm to open or close the clutch-box R, substantially as set forth.

3. The foot-piece X, connected with the rock-shaft T, the rods *n'*, arms *t'*, and arm *u'*, in combination with the clutch-box H and wheels N P, connected by a chain or belt, and with the revolving rake, substantially as specified.

In testimony that I claim the foregoing improvement in hay-rakes, as above described, I have hereunto set my hand this 31st day of May, 1880.

HAMLINE H. HAGERMAN.

Witnesses:

T. E. BARROW,

H. D. B. WILLIAMS.