

(No Model.)

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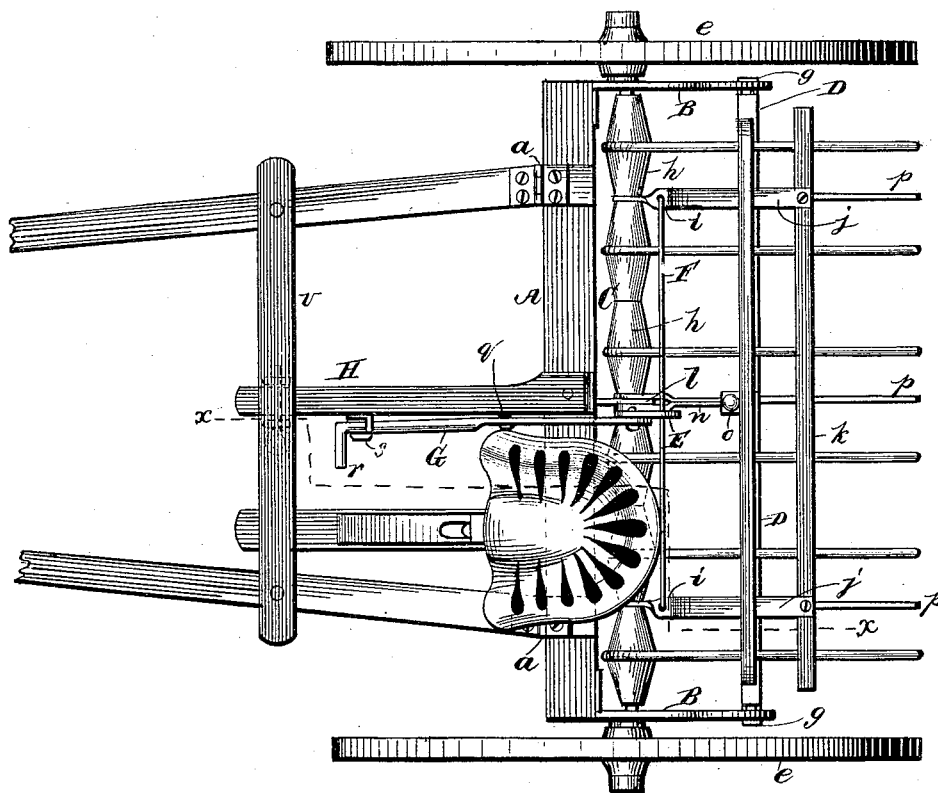
C. BOLLINGER.

HORSE RAKE.

No. 263,469.

Patented Aug. 29, 1882.

*Fig. 1.*



*Witnesses.*

*Robert Everett.*  
*Albert H. Norris.*

*Inventor.*

*Cornelius Bollinger.*

*By James L. Norris.*

*Atty.*

(No Model.)

2 Sheets—Sheet 2.

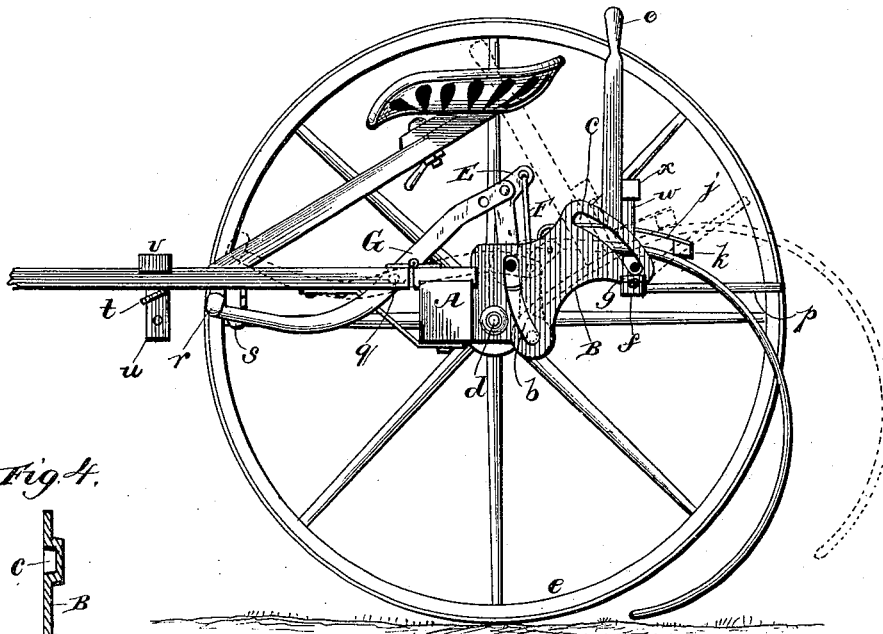
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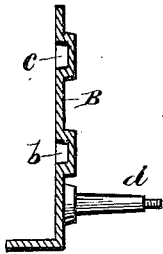
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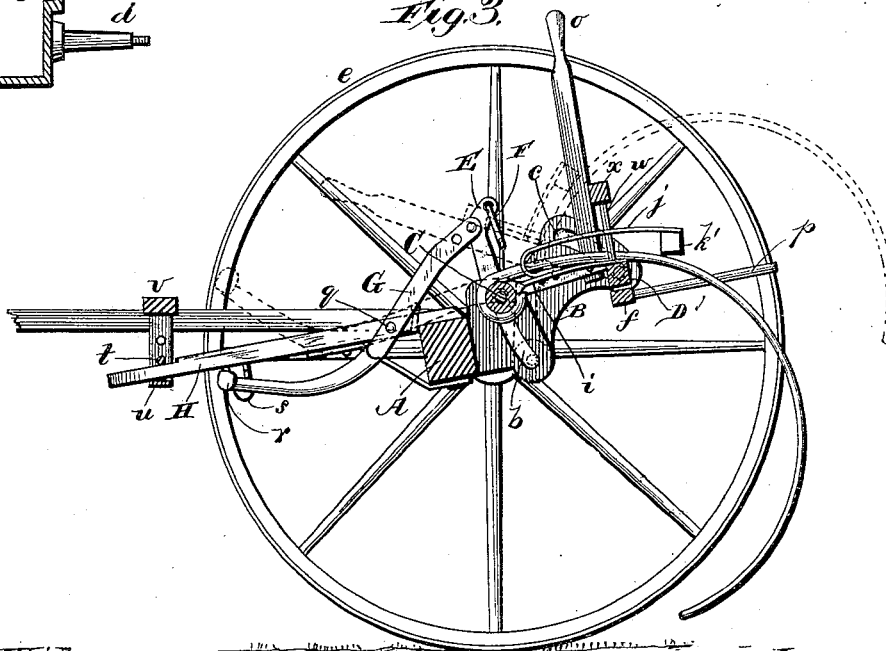
*Fig. 2.*



*Fig. 4.*



*Fig. 3.*



Witnesses.

*Robert Everett.*  
*Albert H. Norris.*

*Inventor.*

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# UNITED STATES PATENT OFFICE.

CORNELIUS BOLLINGER, OF HARRISBURG, PENNSYLVANIA.

## HORSE-RAKE.

SPECIFICATION forming part of Letters Patent No. 263,469, dated August 29, 1882.

Application filed May 18, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, CORNELIUS BOLLINGER, a citizen of the United States, residing at Harrisburg, in the county of Dauphin and State of Pennsylvania, have invented new and useful Improvements in Horse-Rakes, of which the following is a specification.

This invention relates to improvements in the construction and mode of operation of the horse-rake for which Letters Patent No. 237,951 were issued to me on the 22d day of February, 1881.

The object of my present invention is to provide a simple treadle-lever connection with the rake-head, whereby it can be elevated to lower the rake-teeth and be locked in position to retain the teeth in their adjusted lowered position.

Another object of the present invention is to dispense with pivoted clearers and their treadles (shown in my aforesaid patent) and locate the clearers on a rear fixed bar, which also serves to maintain the rear journaled support of the rake-teeth when in its lowered position, and to brace the plates or castings in which the rake-head moves, whereby the clearers will not interfere with the free vertical movements of the rake-head.

The objects of this invention I accomplish by the construction of horse-rakes illustrated in the accompanying drawings, in which—

Figure 1 represents a plan or top view of a horse-rake constructed in accordance with my invention; Fig. 2, a side elevation of the same with one of the ground-wheels removed. Fig. 3 is a sectional view on the line *xx*, Fig. 1, showing the teeth adjusted, so as to avoid tearing up young clover and yet rake the cut hay; also showing by dotted lines the position of the parts when the rake-teeth are elevated to dump a load. Fig. 4 is a detached sectional view of a modification of one of the plates or castings.

Referring to the drawings, the letter A indicates a horizontal bar, to which the draft thills or pole are hinged at *a*, and B indicates the metallic plates or castings, provided with vertically-arranged reverse segmental slots *b* and *c*, and a lateral journal, *d*, on which the ground-wheels *e* revolve. One of these plates is securely attached at each end of the bar A,

and the latter, through the plates or castings and journal, constitutes the axle of the machine.

The rake-head C is provided at each end with a stud arranged to travel in the slots *b*, and the rear bar or tooth-support, D, for the teeth has similar studs, arranged to travel in the slots *c* of the plates or castings. The rear ends of the said plates or castings are united and sustained parallel to each other by a rigid rod, *f*, having end clips extending around the plates or castings, as at *g*. This connecting-rod not only braces the said plates, but it serves as a rest or support for the rear bar or tooth-support, D, when in its lowered position. The rake-head C may be of any suitable construction; but in the present instance it is composed of a rod extending through a series of blocks, *h*, having each an enlarged central portion, to which one of the ends of the spring rake-teeth is secured, each block being adapted to rotate, so that the rake-teeth can independently rise and fall to conform to the surface traversed.

To the rake-head are attached rearwardly-projecting arms *i*, connected to the movable rear tooth-support, D, and to the said arms are secured one end of flat springs *j*, carrying at their rear ends a transverse pressure-bar, *k*, which acts to keep the rake-teeth in working position, but permits them to independently yield in vertical planes.

To the central part of the bar or axle A is secured the rearwardly-projecting plate *l*, having a vertical segmental slot, through which the rake-head extends and by which it is centrally guided and supported in its rising and falling movements, as in my patent referred to. At this central point of the rake-head the latter is joined to the rear tooth-support, D, by a bifurcated arm, *n*, which embraces the slotted plate *l*, and to said bar, adjacent to the rear tooth-support, is secured a vertically-projecting hand-lever, *o*. These devices provide means for rocking the rear tooth-support, D, to cause the rake-head to descend in its guide-slots, and thereby elevate the rake-teeth, as represented by dotted lines, Fig. 2, a continuation of the forward movement of the hand-lever *o* causing the tooth-support D to rise in the slot *c* and thereby further elevate the rake-

teeth to effect the dumping of the load. The clearers *p* are attached to and project rearward from the transverse rod *f*, which braces the plates *B*, and by this arrangement the clearers need not be pivoted and will not interfere with the free rising and falling movements of the rake-head.

To the center of the rake-head is secured an upwardly-projecting rigid arm, *E*, having a short rearward extension at its upper end, through an opening in which passes a transversely-arranged truss-rod, *F*, having its ends secured to the arms *i*, and to the upper end of said arm *E* is pivoted one end of a foot-lever, *G*, the latter being also pivoted at or near its center *g* to a forward extension, *H*, attached to the bar or axle *A*. The front end of the lever is furnished with a pedal, *r*, for the driver's foot, and the lever is adapted to engage any one of a series of notches on a plate, *s*, secured to the forward extension, *H*.

By depressing the forward end of the lever *G* through the pedal its rear end will be raised, and, through the arm *E*, the rake-head will be caused to ascend, thereby lowering the rake-teeth into position for raking purposes, and when so adjusted the rake-head can be locked by causing the lever *G* to engage the notched plate *s*.

The object of the truss-rod *F* in the arrangement described is to sustain and aid in lifting the rake-head and to relieve the center portion of the rake-head from undue strain, which would result if the lifting-power were applied only at the center.

Although I have described the truss-rod as attached at its ends to the arms *i*, it will be obvious that it can be attached to the rake-head, and also that the truss-rod can be connected with the lifting-arm *E* by means other than the opening therein.

The arrangement of treadle mechanism described being connected with the rake-head above, the same enables me to dispense with the cumbersome hanging devices employed in my patent referred to for raising and lowering the rake-head through the medium of the driver's feet.

In order to adjust the points of the rake-teeth at varying distances from the ground, so as to avoid tearing up young clover and yet rake up cut hay, I provide means for turning the bar or axle *A*, which is permitted by hinging the draft thills or pole thereto. The adjustment of the bar or axle is effected by depressing the outer end of the forward extension, *H*, and locking it down by a pin, *t*, passing through a loop or bracket, *u*, in which the end of said extension moves, the loop or bracket depending from the under side of the cross-bar *v* of the draft thills or pole.

It will be obvious that devices other than the pin and loop or bracket can be provided for holding the end of the forward extension in its adjusted position. In Fig. 3 I have shown the parts in full lines adjusted to raise

the rake-teeth from the ground to avoid tearing up young clover and yet effect the proper raking of the hay.

The rear tooth-support, *D*, is provided with upright guides *w* for the rake-teeth, said guides being attached at their upper ends to a transverse bar, *x*, and the hand-lever *o* is secured to said elevated bar, thereby providing a powerful leverage for raising the rear tooth-support and depressing the rake-head.

Instead of making the guides for ends of the rake-head and the rear tooth-support in the form of open slots *b c* in the plates or castings *B*, said guides may be formed as segmental grooves in the plates, as shown in Fig. 4.

As in my patent referred to, the rear tooth-support, *D*, having its ends arranged as journals in the slots *c*, provides a pivotal bearing for the teeth between their points or free ends and the rising and falling rake-head, on which pivot the rake-teeth can be oscillated or rocked for raising or lowering their points, and in the rising movement of the teeth they move rearward and upward in a circulatory path, which permits the hay to be freely discharged. Further than this the rake-teeth are balanced, and but little power is required to lift the teeth, owing to the fulcrum provided by the journaled rear tooth-support, *D*.

What I claim is—

1. In combination with a rake-head arranged in guideways to rise and fall and provided with a rigid upwardly-projecting arm, a rear tooth-support journaled in guideways, in which it is adapted to first rock and then ascend, a foot-lever secured by a pivot to a part of the frame and secured at its rear ends to the upper end of the arm on the rake-head, and a locking device for engaging the forward end of the foot-lever, substantially as described.

2. The combination of the rear tooth-support journaled in guideways, in which it is adapted to first rock and then rise and fall, guides projecting upward from said tooth-support for receiving the rake-teeth, a cross-bar rigidly connected with the upper ends of the said tooth-guides, a hand-lever secured to the cross-bar, a rising and falling rake-head, and a bar connecting the lower end of the hand-lever to the rake-head, substantially as described.

3. The combination, with the plates or castings having slots in which the rake-head and the journaled tooth-support are adapted to rise and fall, of the transverse rod connecting and bracing said plates or castings and serving as a rest for the rear journaled tooth-support.

4. The combination, with the plates or castings having slots in which the rake-head and the rear journaled tooth-support are adapted to rise and fall, of the transverse rod connecting and bracing said plates or castings and carrying the rearward-projecting clearers, said rod also serving as a rest for the rear journaled tooth-support.

5 5. The combination of the ascending and descending rake-head, carrying rake-teeth and provided with an upward-projecting rigid arm, of the transverse truss-rod supported on the arm and having its ends connected with the rake-head, and a foot-lever connected with the said rigid arm above the rake-head.

10 6. In a horse-rake, the combination of the wheel-axle, the thills hinged directly to the axle and having a cross-bar provided with a depending bracket, a bar rigidly secured at its rear end to the axle between the thills, and having its front end guided by the bracket on

the cross-bar of the thills, and a locking device for securing the front end of the bar in its adjusted position within the depending guide-bracket, substantially as and for the purpose described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

CORNELIUS BOLLINGER.

Witnesses:

JOEL K. OLLINGER,  
WM. WOLF.