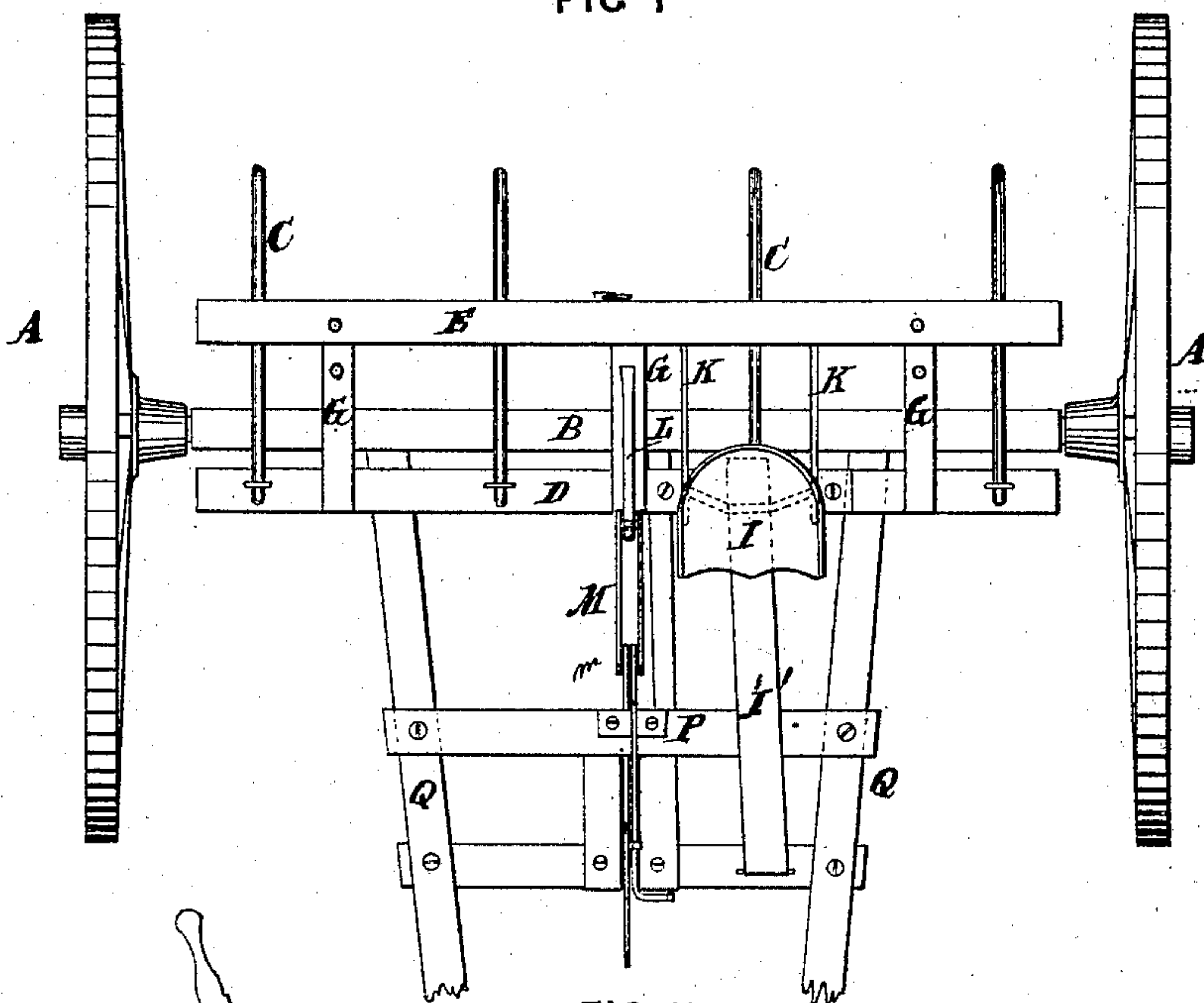


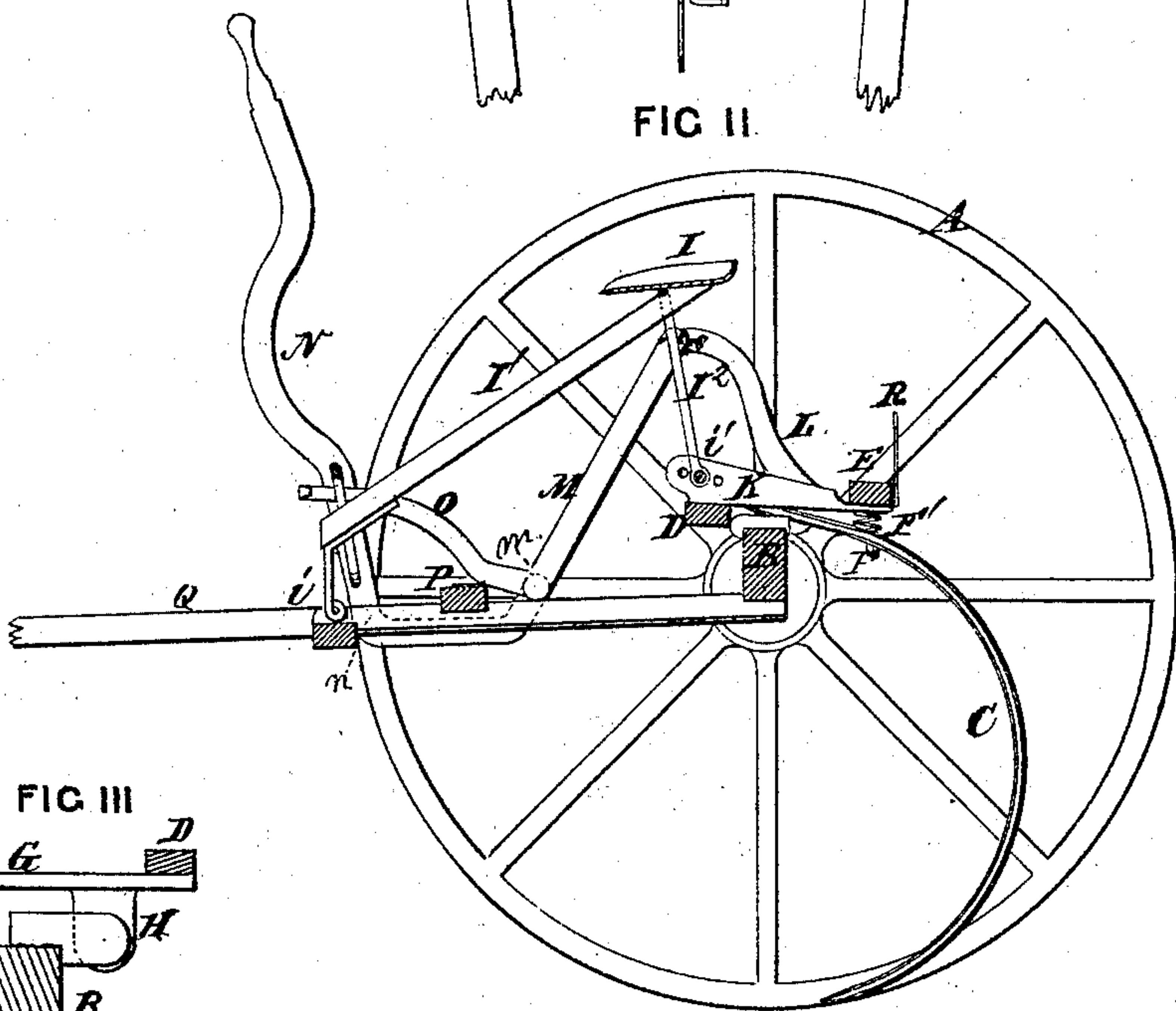
## HORSE-RAKE.

Patented Nov. 16, 1875.

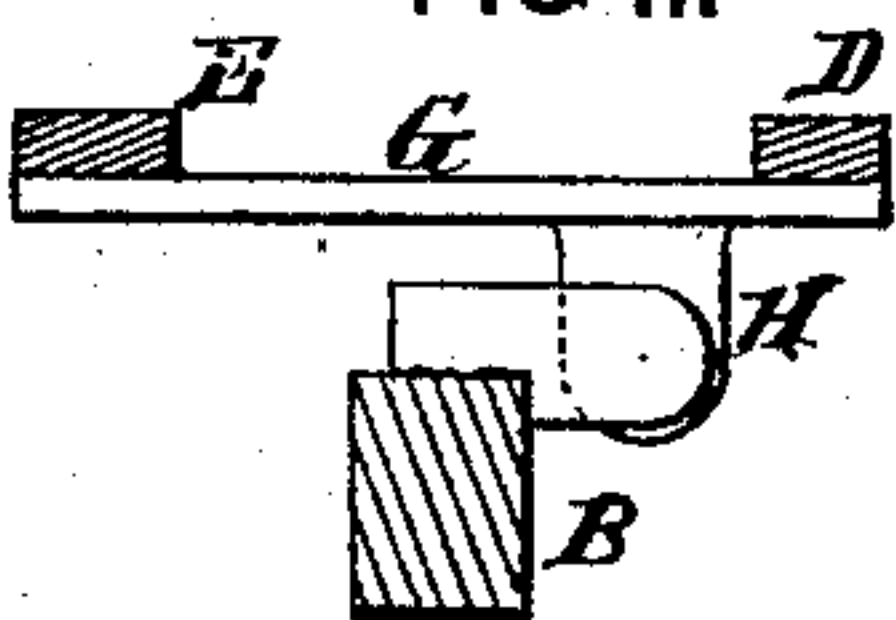
**FIG 1**



**FIG 11.**



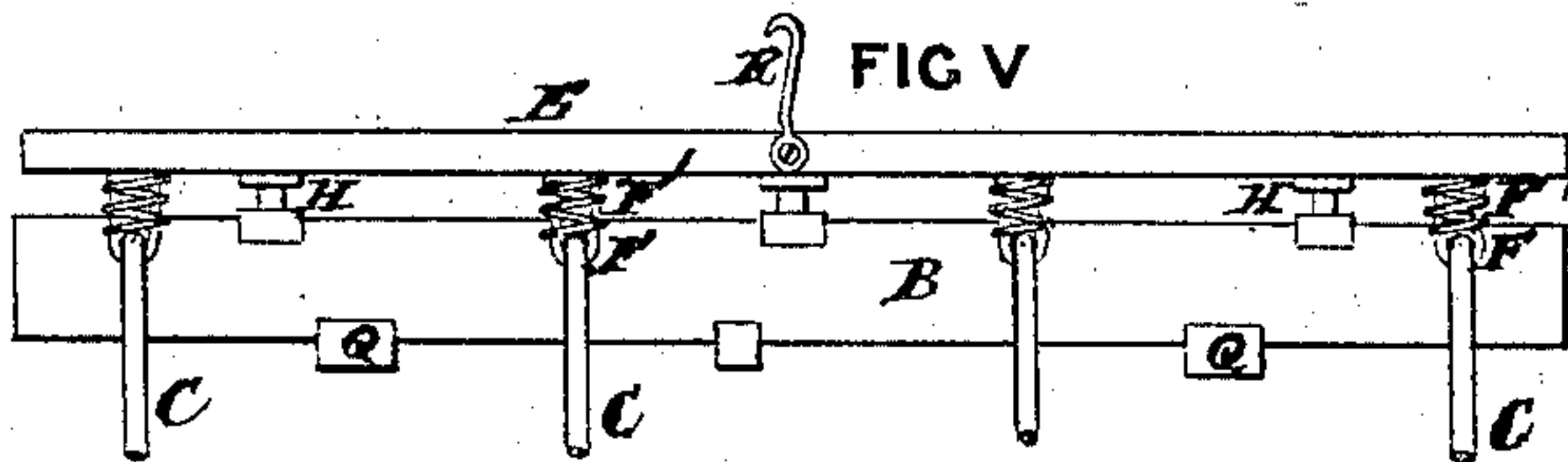
**FIG. III**



**FIG IV**



**FIG V**



A. Ruppert,  
R. C. Quinn

INVENTOR

D. P. Holloman & Co  
Atty



# UNITED STATES PATENT OFFICE.

JOHN H. THOMAS, OF SPRINGFIELD, OHIO.

## IMPROVEMENT IN HORSE-RAKES.

Specification forming part of Letters Patent No. 170,130, dated November 16, 1875; application filed June 11, 1874.

*To all whom it may concern:*

Be it known that I, JOHN H. THOMAS, of Springfield, in the county of Clarke and State of Ohio, have invented a new and useful Improvement in Hay-Rakes; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is a plan view. Fig. 2 is a vertical longitudinal section. Fig. 3 is a vertical longitudinal section of the hinge-joint by which the rake-head is attached to the axle. Fig. 4 is an end view of the same; and Fig. 5 is a transverse section, showing the operation of the springs on the rake-teeth.

The same letters are employed in all the figures in the designation of identical parts.

My invention applies to that class of hay-rakes in which elastic semicircular teeth are attached to a rake-head, by which they are held until a sufficient gavel has been collected, and then they are raised so as to discharge it. And my improvements consist in the means employed for operating the rake, as will be specifically designated in the following description and claims.

This machine is carried upon wheels A A, attached to an axle, B. The rake-teeth C are made in the usual manner of spring-steel, having their upper ends attached to an oscillating cross-head, D, by which they are operated in collecting or releasing the gavel of hay. This rake-head D is hinged in front of the axle, in order to counterbalance to some extent the weight of the teeth, and also to bring the points of the teeth, which are from four to seven inches in rear of the hinge, as nearly as may be under the axle, in order more perfectly to accommodate them to furrows or other inequalities of the surface over which the wheels may pass. A bar, E, is placed on arms G behind the axle and over the teeth. On the under side of this bar are eyes F, which embrace the teeth, and are surrounded by short spiral springs F', which, bearing against the bar E, press down upon the teeth. In order that the amount of the resistance of these springs may be adjusted to adapt them to use in gathering heavy or light grass, the bar E may be attached to the arms G, which are bolted to the

rake-head D by bolts passing through either of a series of holes, so that the springs F' may be set farther from, or nearer to, the upper ends of the teeth, where they are attached to the rake-head, and consequently by moving the bar E the leverage of the teeth may be adjusted according to the degree of force it is desirable that the springs may be made to apply. The rake-head D is connected with the axle by a hinge, H, clearly shown in Figs. 3 and 4, by which it is advanced in front of the axle, to the required extent, to accomplish the purposes hereinbefore designated. The driver's seat I is carried upon arms I<sup>1</sup> and I<sup>2</sup>, the former extending forward and hinged to the shaft-frame at i, and the latter are hinged to the rake-head at i'. I have shown them as hinged to arms K, extending back under the bar E; but this is not essential, as I have, in some rakes attached the hinge directly to the rake-head, and in others have made them as shown, and in yet others I have formed the hinge on a stationary rake-head, the seat-supports turning on this hinge and extending back, so as to rest under the spring-bar E, which is raised as the seat descends. In the case illustrated in the drawings the hinge-joint is formed by a rod passing through the arm I<sup>2</sup> I<sup>2</sup>, and through either of a series of holes in the arm K, so that by this means the driver's seat may be adjusted forward or back to increase or diminish the leverage according to the weight of the driver. A curved standard, L, is raised from the middle arm G, and to its upper end the links M are pivoted, their lower ends being in like manner pivoted to the short arm of the hand-lever N, which is a bell-crank lever, having its pivot at n in pieces connected with the shaft-frame Q. Its long arm extends up within convenient reach of the driver, who, by drawing it toward himself, can raise the teeth to release the gavel.

In order that the driver may hold down the teeth while gathering the load, a bent foot-lever, O, is pivoted at the point of junction of the links and hand-lever at m, and carried forward and passed through an elongated space formed by a guard attached to the hand-lever, and then bent at a right angle to receive the driver's feet. This lever is bent where it rests on a fulcrum formed on the cross-brace P of



the shafts Q. This gives all the leverage necessary to enable the driver to hold down the points of the teeth, which is not sufficiently provided for by merely resting his foot against the hand-lever, for then the force is applied too near the fulcrum to be effective, and at the same time a yielding resistance is applied, which is safer for the machine than the rigid locks which have heretofore been employed to hold the hand-lever. As the foot lever plays freely within the guard it does not at all interfere with the action of the hand-lever. It is not necessary that the foot-lever should be pivoted at the junction of the links and hand-lever. I have suggested this as, in my opinion, the best arrangement; but it may be pivoted to either the links or the hand-lever, and may be bent or straight, without departing from the principle of my invention.

The use of this foot-lever becomes more necessary because the weight of the driver is sustained upon the rake-head. When the teeth are down, as the arms I<sup>2</sup>, which support the seat on the rake-head, are nearly in line with the pivots of the hinges H H, the weight of the driver does not tend to lift much on the rake-teeth; but the weight should be sufficient to raise the rake-teeth, and to this end the seat may be set forward or back, according to the weight of the driver.

As soon, however, as the rake-head is depressed by the action of the driver drawing on the hand-lever, his weight begins to bear more and more in front of the pivots of the hinges, and, consequently, to exert an increasing force on the teeth. By this means the weight of the driver is made effective to assist in raising the rake-teeth, with a force increasing as his power to exert muscular force on the hand-lever is diminished by drawing it nearer to his body.

In driving to and from the place of operations the lever may be pulled clear back and secured by the hook R. As the driver's seat is hinged both at *i* and *i'*, it is never materially changed from its horizontal position by the elevation or depression of the rake-head, the arms I<sup>2</sup> also turning freely at their junction with the arm I<sup>1</sup>.

I am aware that the weight of the driver has been made available for aiding in the operation of the rake-teeth, so that I do not claim broadly this feature of my invention.

I am aware that wire-toothed rakes have been patented in which the weight of the driver has been used for lifting the rake-teeth; but in such cases some locking device, such as a toggle-joint, has been made to sustain the weight of the gathered hay, and also of the driver, in whole or in part. In such cases it

was necessary to trip the locking device before the weight of the driver could be made to raise the teeth. In my machine both the strain of the load and the weight of the driver are made to act on the foot-lever, and any undue strain is immediately felt by the driver, who can let go the teeth by simply raising his foot. In other machines wooden teeth were used, in which a foot-lever was employed to sustain the weight of the driver, which, when released, would permit the weight of the driver to act on the teeth to raise them; but in such machines neither the weight of the driver nor the strain of the foot-lever had any effect to hold the teeth down, they being held down by their own weight only, and the driver would not feel any undue strain coming on the teeth, as in my rake.

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

1. In a wire-toothed rake, in which the teeth are held down against the resistance of the work by pressure on a foot-lever, in combination with the rake-head and foot-lever made to sustain the strain on the teeth without the intervention of a locking device, a driver's seat resting on the rake-head, so as to exert a constant lifting-action on the teeth when not sustained by the foot-lever, substantially as set forth.

2. The combination, in a wire-toothed rake, in which the rake-head is hinged to a fixed axle, and the driver's seat rests on the rake-head, so as to exert a constant lifting-action on the rake-teeth, of the foot-lever sustaining the weight of the driver and the resistance of the teeth without the intervention of a locking device, and the hand-lever for operating the rake head and teeth, substantially as set forth.

3. The combination of the axle, overhanging rake-head, and driver's seat, which rests and bears constantly with a tendency to lift the teeth on the rake-head nearly in a line with the pivot of the hinge when the teeth are down, and with an increasing pressure as the teeth are raised, substantially as set forth.

4. In combination with a rake-head hinged to a fixed axle, a driver's seat adjustably attached to the rake-head, and constantly exerting a force to lift the teeth to an extent determined by the adjustment of the parts, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN H. THOMAS.

Witnesses:

R. H. RODGERS,  
C. E. THOMAS.