

(No Model.)

A. E. ROBERTS.

RAKE TOOTH.

No. 387,815.

Patented Aug. 14, 1888.

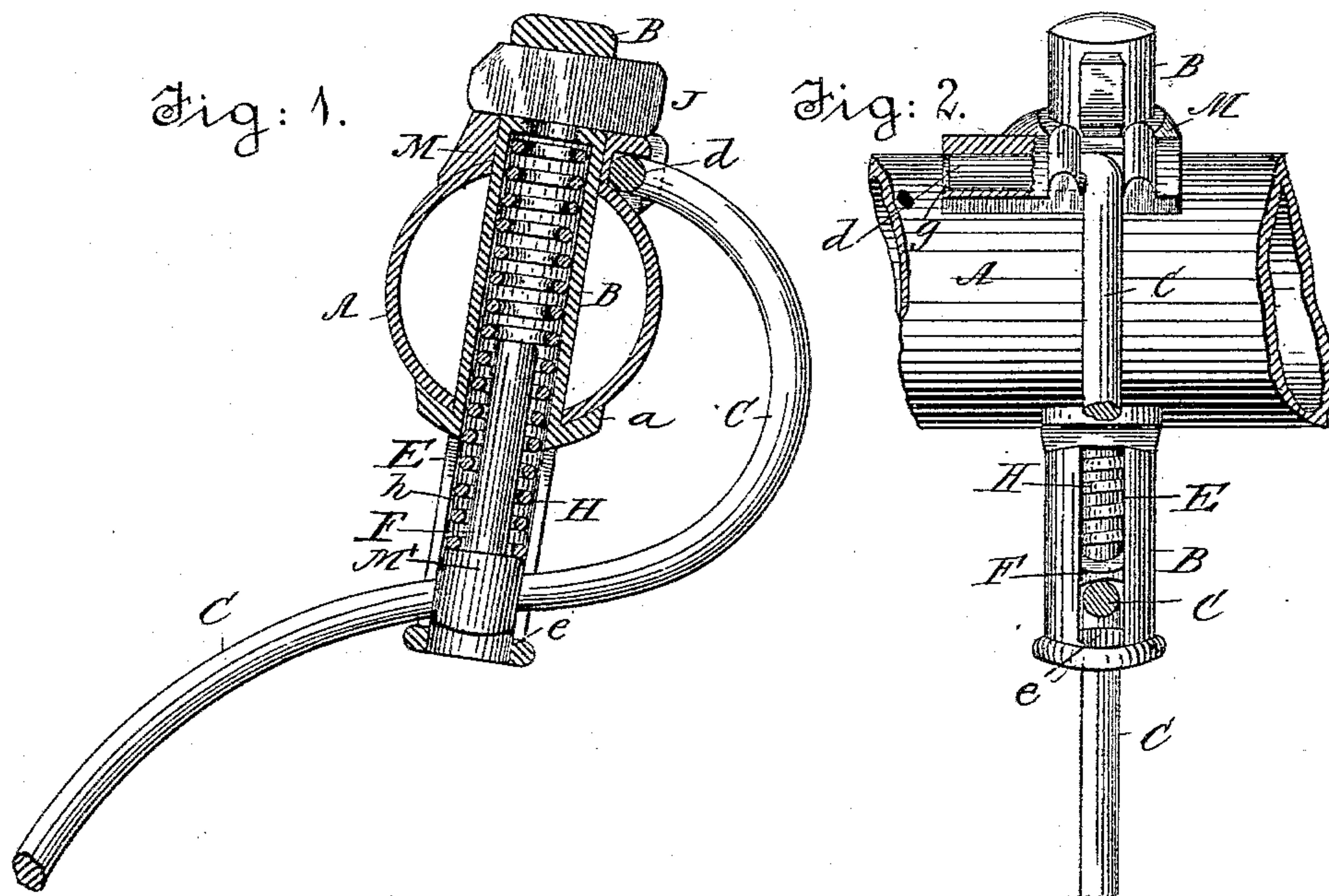
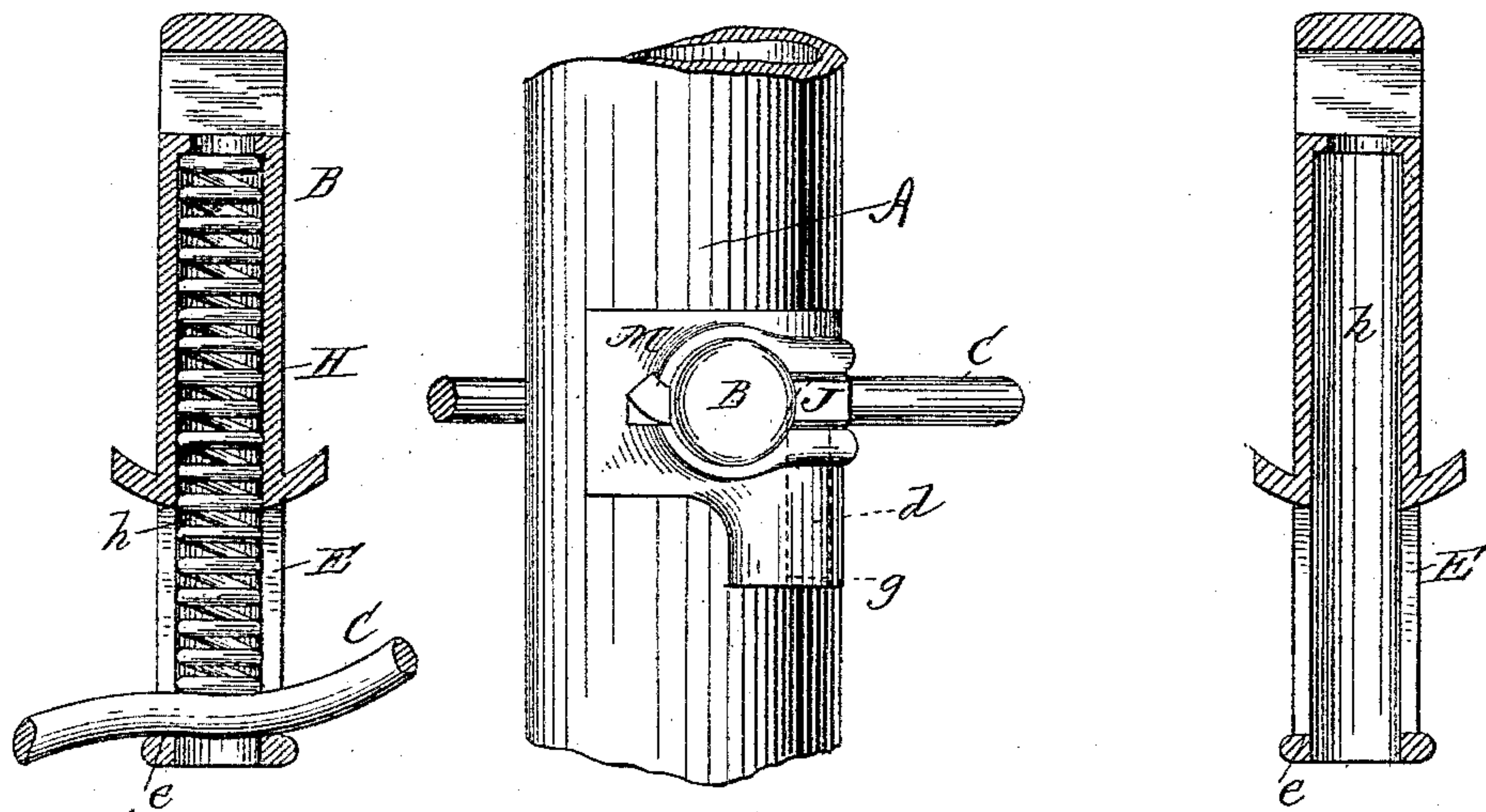


Fig: 4.

Fig: 3.

Fig: 5.



Witnesses:

Wm. F. Bellom  
John F. Nelson.

Inventor:  
Albert E. Roberts.  
Per, *Kennicott & Co.*  
his Attorneys.



# UNITED STATES PATENT OFFICE.

ALBERT E. ROBERTS, OF NORWALK, OHIO, ASSIGNOR OF ONE-HALF TO  
BARNARD CORTRITE, OF SAME PLACE.

## RAKE-TOOTH.

SPECIFICATION forming part of Letters Patent No. 387,815, dated August 14, 1888.

Application filed February 9, 1887. Serial No. 237,005. (No model.)

*To all whom it may concern:*

Be it known that I, ALBERT E. ROBERTS, a citizen of the United States of America, and a resident of Norwalk, in the county of Huron and State of Ohio, have invented certain new and useful Improvements in Horse Hay-Rakes, of which the following is a specification.

This invention relates to horse hay-rakes, and more particularly to that class described in the Letters Patent of the United States granted to me November 9, 1886, No. 352,205, and to which reference may be had; and it consists in the novel construction and combination of parts hereinafter described and claimed.

In the accompanying sheet of drawings the present invention is illustrated, in which—

Figure 1 is a sectional view across the rake-head and centrally through the parts of bearing for one rake-tooth. Fig. 2 is a view at the front side of the rake-head with parts broken away and in section. Fig. 3 is a plan view. Fig. 4 is a detail sectional view illustrating a modified form of the tooth-support. Fig. 5 is a detail sectional view of the tubular spindle removed.

In the drawings, A represents a rake-head, which may be properly mounted upon traction-wheels in any desirable manner. To connect the rake-teeth therewith in such a manner that they will have a self-adjusting bearing or support at a distance from the rake-head when their lower ends come in contact with unyielding obstructions on the ground, I provide a series of tubular bolts or spindles, B, passing transversely through the head, and at or about the top of which is secured one end of the rake-tooth C, which tooth is substantially S-shaped and intermediate of its length bears upon the lower end of a yielding bearing or plunger, F, which works within and is guided by the hollow transverse bolt or spindle B against a spring, H, located in said spindle.

The manner shown of securing the transverse bolt or spindle B in its rigid position on the rake-head consists, substantially, in boring the head transversely, through which bores the spindle or bolt is passed, its upper end projecting above the periphery of the head,

and a shoulder, *a*, formed upon the bolt or spindle B, bears against the under side of the rake-head. A collar, M, is placed over the upper projecting end of the spindle or bolt B, and a key, J, is passed through said spindle and bears upon the collar, the said key serving to draw the shoulder *a* against the under surface of the head A, thus effectually securing the bolt or spindle in the position described.

The upper end of the rake-tooth is provided with an angular bend, *d*, which is entered into a socket, *g*, in the collar M, which collar, when secured in place, lies firmly and immovably against the rake-head A.

The rake-tooth passes in a curved line forward of the periphery of the rake-head A, then curves downward and to the rear to a position below it in the same transverse plane as the bolt or spindle B, and passes through a slot, E, in said bolt or spindle, the sides of the said slot E serving to hold the rake-tooth from any lateral movement, and the end *e* of the slot also serving to limit the downward or outward movement of the tooth.

As before mentioned, the spindle or bolt B is tubular or chambered, as at *h*, and within this chamber is placed a plunger or bearing, F, having an extended spindle, of reduced diameter, which is surrounded by a spiral spring, H, one end of which spring rests against the shoulder M' of the plunger F, and the other end rests against the upper end of the chamber of the spindle; and, if desired, the plunger F may be dispensed with and the rake-tooth caused to rest upon the outer end of the spiral spring H, as shown in Fig. 4.

It will be seen from the foregoing description and the accompanying drawings that a rake-tooth when moved over the ground and brought in contact with any unyielding substances—such as a stone, clod, &c.—will be pressed against the plunger and yield with the movement of the latter, which will be pressed inwardly against the spiral spring, and under the reaction of said spring the tooth is pressed outwardly again when the obstruction has been passed, thereby causing the said teeth to assume their normal position.

It will be observed that the upper end of the



rake-tooth is hinged to the axle, while its lower end rests on the ground, and that it curves downward from in front of the axle, thence backward beneath the axle to the ground.

5 The spring is of course not fastened to the tooth; but the tooth as it flexes may slide a little forward and backward through the spring-support. It is thus seen that whenever the point of the tooth rides over an obstruction on  
10 the ground the tooth, by thus sliding slightly through the spring-support, is shortened between its upper hinged end and the said spring is lengthened somewhat between the said spring and the point of the tooth. Therefore when the  
15 spring is thus by compression caused to act with a greater tension against the tooth the free end of the tooth is sufficiently lengthened to compensate for the said increase of tension. This construction and operation of the tooth  
20 causes the action of the spring to be substantially the same whether the point of the tooth is riding over a level or over an obstruction. The tooth is thus caused to operate with substantial uniformity in all cases; whereas if this  
25 change of position of the spring with respect to its point of bearing upon the tooth did not take place the result would be that in riding over an obstacle of that character the tooth would, by virtue of the greater tension of the  
30 spring, gouge into the ground or obstacle and also increase the draft of the machine.

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

35 1. The stationary tubular support projected up through the rake-head, with a shoulder beneath the rake-head to limit its upward movement, and a bolt and key at its top for holding it rigidly in place, said tubular support  
40 slotted at its lower end for the passage of the tooth and adapted to receive within its interior a plug through which the tooth passes, and a spiral spring to bear upon the plug, substantially as and for the purposes described.

45 2. The combination, with a rake-head and tooth, of a stationary tubular support projected up through the head, and having a lower extension provided with a slot through which the tooth is passed, a spring and plug  
50 within the tubular support bearing upon said tooth, said tubular support provided with a key and bolt at its top, and a shoulder beneath the rake-head and the clamp M, whereby the shank of the tooth is secured to the  
55 rake-head, substantially as described.

60 3. The combination, with a rake-head and a tooth having a right-angular shank at its top, of a clamp engaging said shank, so as to permit the latter to turn therein, and a stationary tubular support slotted at its lower end to receive the rake-tooth, and provided in

its interior with a spring and a plug, through the latter of which the said tooth passes and has its bearing, said tubular support passed  
65 up through the rake-head and clamp, and provided with a shoulder, *a*, and a single bolt and key, whereby the tooth, its clamp, and the tubular support are all held rigidly in place, substantially as described.

4. The combination, with a rake-head, of a  
70 hollow spindle passing transversely there-through, provided with a key, J, to bear on the top of the rake-head, and shoulder *a*, abutting against the opposite side for its confinement to the rake-head, a yielding tooth-support within said spindle, and a rake-tooth  
75 confined at the upper side of the rake-head, and having a bearing intermediate of its length in said yielding support, substantially as described.

80 5. The combination, with a rake-head, of a rigidly-attached hollow spindle passing transversely therethrough, provided with a slot and key, J, a shoulder, *a*, to bear on the under side of the head, a slot, E, and an abutment, *e*, a clamp, M, between the key J and  
85 the upper side of the head, a plug, F, a spring, H, and a rake-tooth confined in said clamp and passing through said slot E, and having a bearing in said plug, substantially as described.

6. The combination, with a rake-head, of a hollow spindle passing transversely there-through, provided with a key, J, to bear on  
95 the top of the head, and shoulder *a*, abutting against the opposite side for its confinement to the rake-head, a yielding tooth-support within said spindle, and a rake-tooth confined at the upper side of the rake-head, and having  
100 a bearing intermediate of its length in said yielding support, substantially as described.

7. The combination, with a rake-head, of a rigidly-attached hollow spindle passing transversely therethrough, provided with a slot and  
105 key, J, a shoulder, *a*, to bear on the under side of the head, a slot, E, and an abutment, *e*, a collar, M, between the key J and the upper side of the head, a plunger, F, a spring, H, and a rake-tooth confined in said collar  
110 and passing through said slot E, and having a bearing in said plunger, substantially as described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence  
115 of two witnesses, this 3d day of February, 1887.

ALBERT E. ROBERTS.

Witnesses:

WM. SEARS BELLOWS,  
J. A. RENNIE.