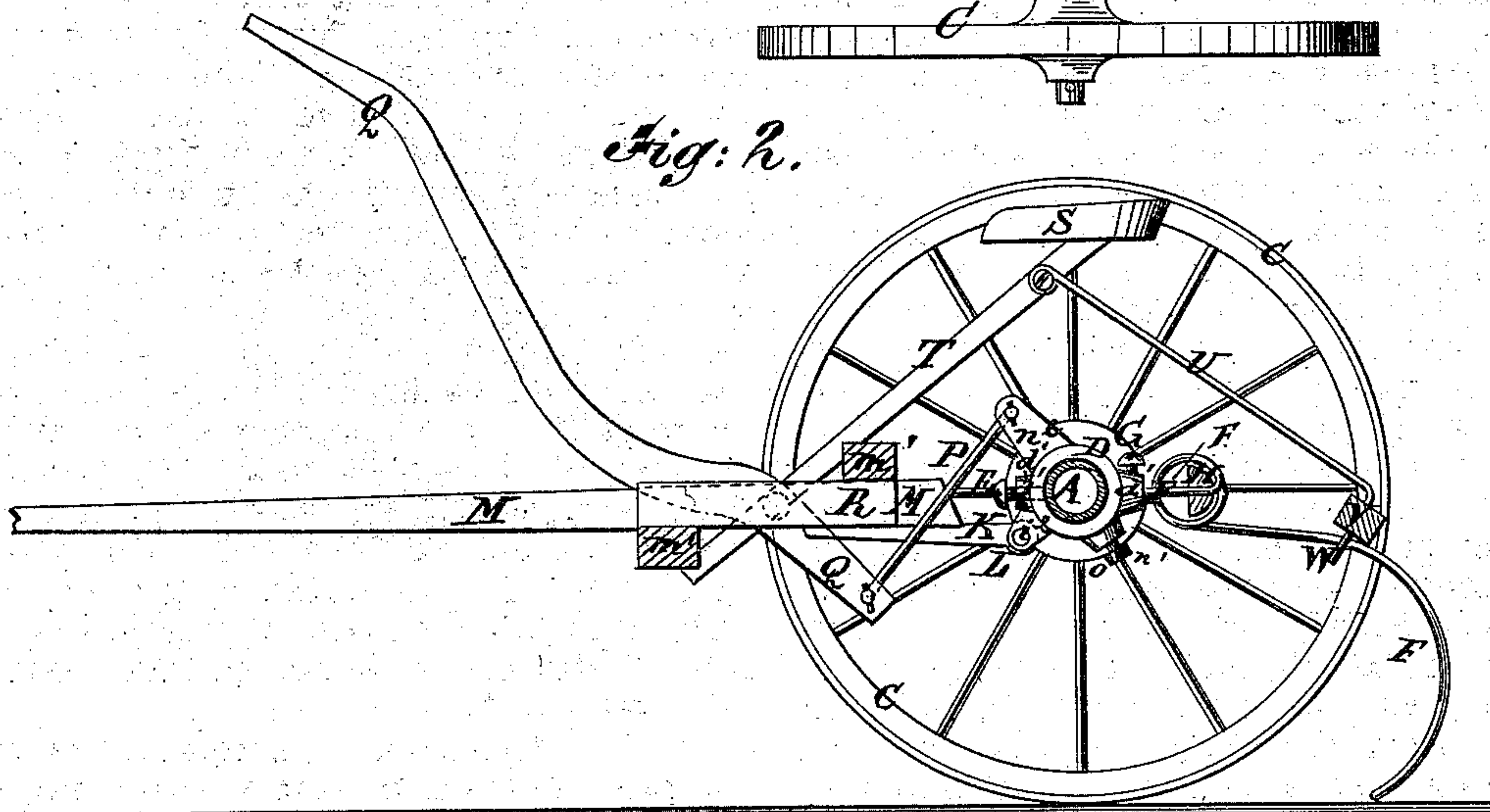
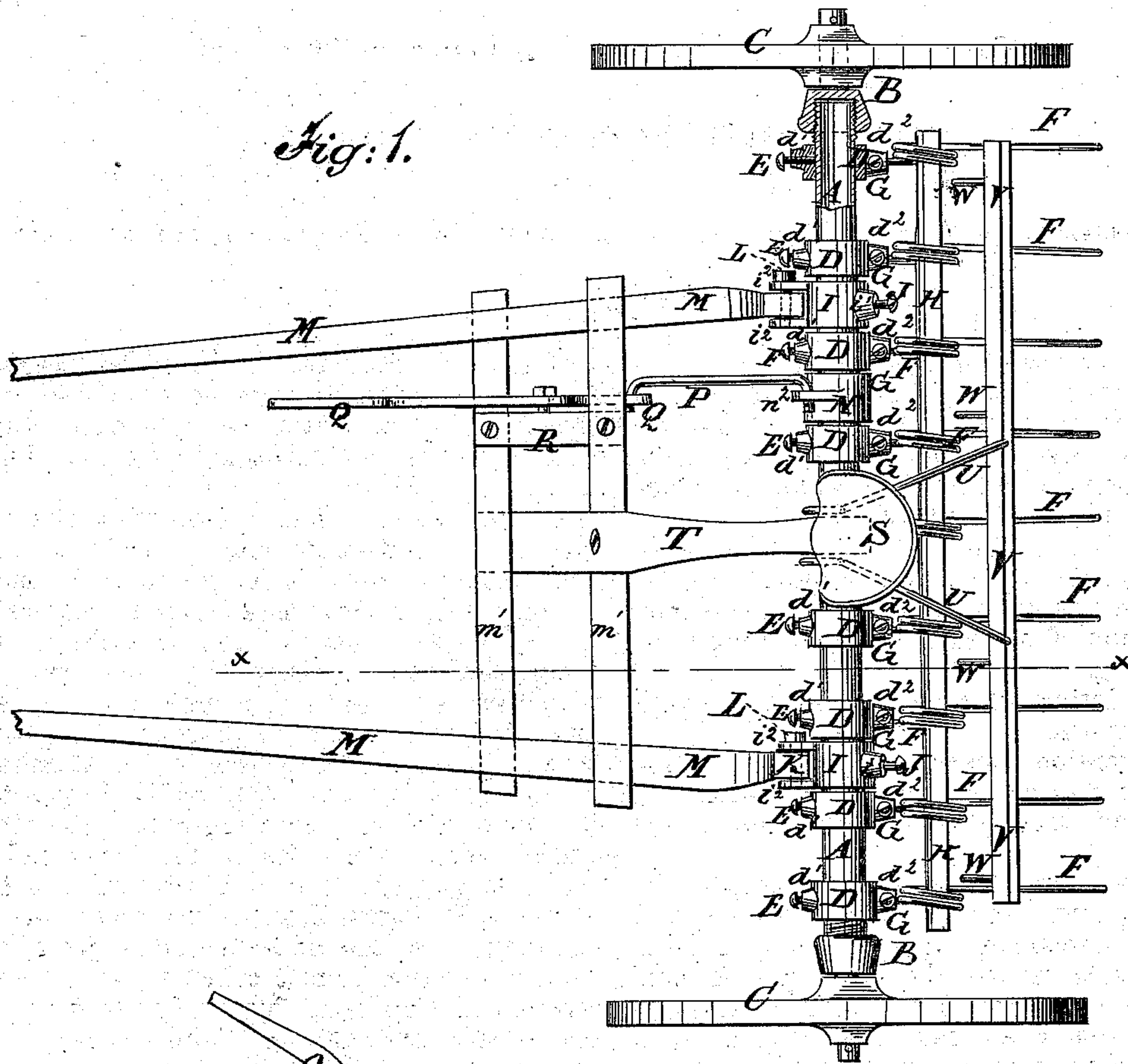


S. H. BUSHNELL.  
Horse Hay-Rakes.

No. 156,275.

Patented Oct. 27, 1874.



WITNESSES:

*Chas. Nida*  
*A. J. Terry*

INVENTOR:

*Solon H. Bushnell*  
BY *Munnell*  
ATTORNEYS.



# UNITED STATES PATENT OFFICE.

SOLON H. BUSHNELL, OF FAIRPORT, NEW YORK.

## IMPROVEMENT IN HORSE HAY-RAKES.

Specification forming part of Letters Patent No. 156,275, dated October 27, 1874; application filed August 29, 1874.

*To all whom it may concern:*

Be it known that I, SOLON H. BUSHNELL, of Fairport, in county of Monroe and State of New York, have invented a new and useful Improvement in Sulky Hay-Rake, of which the following is a specification:

Figure 1 is a top view of my improved sulky hay-rake, part being broken away to show the construction. Fig. 2 is a detail vertical section of the same taken through the line *x x*, Fig. 1.

Similar letters of reference indicate corresponding parts.

The invention consists in the construction and arrangement of parts hereinafter described, and subsequently pointed out in the claims.

A is the axle, which serves, also, as the rake-head, and which is made tubular, and has screw-threads cut upon the outer surface of its ends to receive the axle arms or journals B, upon which the wheels C revolve. The axle-arms B are cast with sockets upon their inner ends to receive and fit upon the ends of the axle A, and have screw-threads cut in their inner surfaces to fit into the screw-threads of the said axle ends. D are collars, placed upon the axle A, and secured adjustably in place upon said axle by set-screws E, which pass in through projections  $d^1$ , cast upon the side of the said collars D. Upon the other side of the collars D are formed projection  $d^2$  to receive the ends of the rake-teeth F, which are secured in place by set-screws G, which pass in through the side of the said projections  $d^2$ , and press against the said teeth. The upper parts of the teeth F pass through holes in the bar H to hold them at the proper distance apart, are coiled around said bar H to give them the necessary elasticity, and their lower parts are curved in the usual way to give them the proper form for collecting the hay. I are two collars placed upon the axle A, and which are secured adjustable in place by set-screws J, which pass in through projections  $i^1$ , cast upon the sides of the said collars I. Upon the opposite side of the collars I are cast two lugs,  $i^2$ , to and between which are pivoted the thill-irons K by bolts L, which pass through them and through the said lugs  $i^2$ . M are the thills, to which the

thill-irons K are secured in the usual way, and which are connected by two cross-bars,  $m^1$ , placed at a little distance from each other, and one above and the other below said thills, as shown in Fig. 2.

By this construction, by adjusting the collars I, the draft-strain may be made to hold the rake-teeth down to the ground with more or less force, as circumstances may require.

N is a collar placed upon the axle A, and secured in place adjustably by a set-screw, O, which passes in through a projection,  $n^1$ , cast upon the said collar N. Upon the opposite side of the collar N is cast, or to it is attached, a short lever or arm,  $n^2$ , to which is pivoted the end of a short connecting-rod, P, the other end of which is pivoted to the lower end of the lever Q. The lever Q is pivoted to a bar or block, R, attached to the two cross-bars  $m'$  of the thills M, and its upper end projects into such a position that it may be conveniently reached and operated by the driver from his seat to raise the rake-teeth and discharge the collected hay. The lever Q has a curve or bend formed in it, as shown in Fig. 2, to adapt it to receive the driver's foot to hold the rake-teeth F down to their work. S is the driver's seat, which is attached to the upper end of the standard T. The standard T is set in an inclined position, and its lower part is placed between and is secured to the cross-bars  $m'$  of the thills M. To the opposite sides of the upper end of the seat-standard T are pivoted the forward ends of two rods, U, the rear ends of which are attached to the cross-bars V, which rests upon the upper parts of the rake-teeth F, and has downwardly-projecting fingers W attached to it, which pass between the rake-teeth F.

By this construction, as the rake-teeth F are raised to discharge the collected hay, the device V W prevents the hay from being raised by and with the rake-teeth F, and causes the hay to be promptly dropped, thus preventing the teeth F from becoming clogged and the hay from being scattered.

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

1. The adjustable collars D, provided with projections  $d^1$   $d^2$  and set-screws E G, for con

necting the rake-teeth F with the axle A, substantially as herein shown and described.

2. The adjustable collars I, provided with projections  $i^1$ , set-screws J, pairs of lugs  $i^2$ , and bolts L, for connecting the thills K M with the axle A of the rake, substantially as herein shown and described.

3. The adjustable collar N, provided with a

projection,  $n^1$ , set-screw O, and lever or arm  $n^2$ , for connecting the hand-lever with the axle A, for discharging the collected hay, substantially as herein shown and described.

SOLON H. BUSHNELL.

Witnesses:

M. R. WILCOX,

JOHN A. McMILLAN.