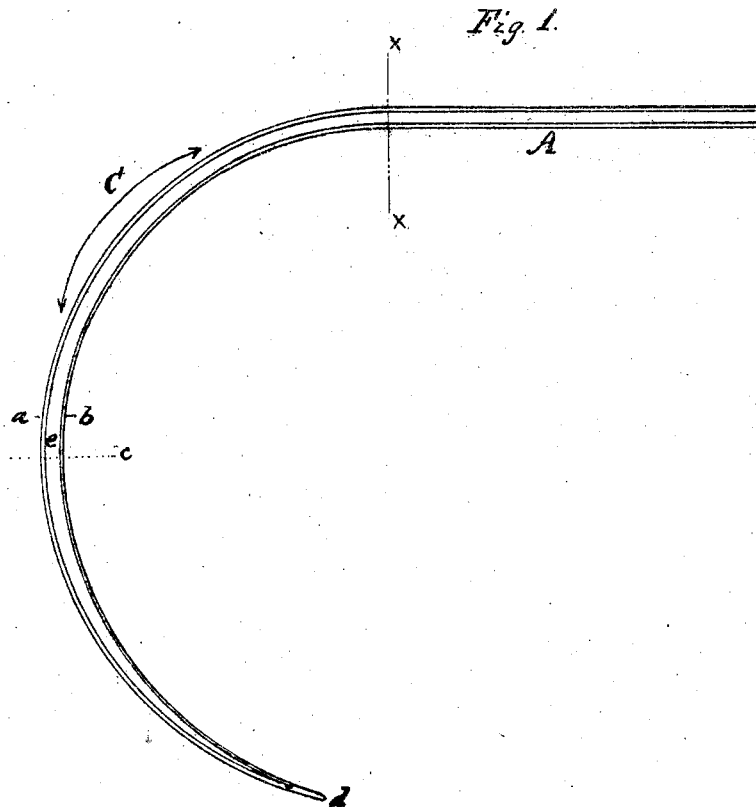


*A. B. Sprout.*

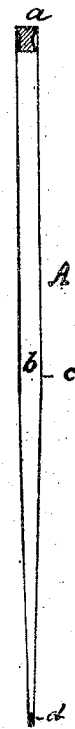
*Horse Rake Tooth*

*N<sup>o</sup> 49800*

*Patented Sept 5, 1865*



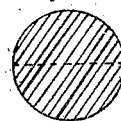
*Fig. 2.*



*Fig. 3.*



*Fig. 4.*



*Witnesses.*

*C. D. Smith  
D. J. Hall.*

*Inventor.*

*A. B. Sprout  
By *Wm. H. Hall*  
Attorney*

# UNITED STATES PATENT OFFICE.

ARIEL B. SPROUT, OF HUGHESVILLE, PENNSYLVANIA.

## IMPROVEMENT IN HORSE-RAKE TEETH.

Specification forming part of Letters Patent No. 49,800, dated September 5, 1865.

*To all whom it may concern:*

Be it known that I, ARIEL B. SPROUT, of Hughesville, in the county of Lycoming and State of Pennsylvania, have made new and useful Improvements in Horse-Rake Teeth; and I do hereby declare the following to be a full, clear, and exact description of the nature, construction, and operation of the same, reference being had to the accompanying drawings, which are made part of this specification.

Figure 1 is a side elevation of my rake-tooth. Fig. 2 is a section of the same on the line  $x x$ , Fig. 1, looking toward the rear. Fig. 3 is a sectional view on the line  $x x$ , and Fig. 4 is a section of a tooth constructed of round iron, the two latter figures being introduced to facilitate explanation by reference to them.

Similar letters refer to corresponding parts in the different figures.

My invention consists, first, in the form given to the sides of the teeth—that is to say, in channeling or hollowing them—as is distinctly seen in the sections, Figs. 2 and 3; second, in gradually increasing the strength of the tooth from the point  $d$  to about the portion C by gradually tapering the steel or iron of said curve between said portions, thereby increasing the tractile strength of the curve and lessening the liability of breaking at or near the portion C by the strain and force gradually brought on and against the said curve and tooth in the raking process.

The purpose of these improvements is to increase the effectiveness and economize the material; also, to cause a larger portion or length of the teeth to be concerned in their deflection; and, further, to avoid the use of weighted bars, springs, staples, braces, &c., used for giving support, strength, and power to the curve of the tooth near the point where it is so liable to break.

To enable one skilled in the branch of manufacture to which my invention appertains to construct and use the same, I will proceed to describe it.

A is a rake-tooth of curved form, and its sides are hollowed out, as shown in the sectional view. It is also tapered from a point at or near the mid-length of the tooth toward its rear end. The advantage of the shape indicated by the curved or hollowed sides consists in throwing

the greater weight of metal to the exterior of the tooth instead of having it in the center. For instance, referring to Figs. 3 and 4, the dotted line through the centers of those figures may be called the "line of inaction" or the "neutral line," the particles of steel in which do not move on each other when the tooth is vibrated, and consequently is not so much exposed to a breaking strain. By placing the greater amount of metal on the outer faces,  $a$   $b$ , of the tooth the weight of metal is more economically and effectively distributed.

The other portion of my improvement consists in gradually increasing the tractive power, thereby modifying the deflection or flexible action of the curve of the teeth by tapering the steel or iron between the point  $d$  and the portion C, so that a larger portion of the tooth may be concerned in its deflection, thereby overcoming the liability of the teeth to break in the curved part, or becoming set in a straightened position when greatly strained and deflected from their normal condition, and also to avoid the use of weighted bars, springs, staples, braces, &c., which have been used to strengthen the teeth at this portion of their length.

It is evident that when the tooth carries its size from end to end (with the exception of the mere point, to which I am not referring) and has the bowed shape usual in horse-rake teeth, of which shape Fig. 1 may be taken as an example, the lower half of the curve, or that between the portion marked C, Fig. 1, and the point of the tooth will be very unequally strained in the action of raking. The weight of the hay being mainly upon the portion adjacent to the point, and the attachment of the tooth being at its other end, the strain will naturally be the greatest in the neighborhood of the mid-length of the portion C in the illustration, Fig. 1, and the design of making it of the taper form I have represented is that a larger portion of its length may be equally concerned in the said deflection—in fact that the tooth from C to  $d$  may be equally deflected by the pressure toward the rear incident to the raking action, and that the lightening of the tooth due to the taper form may be commensurate with the diminished strain incident to its position farther from the point at which the deflection is naturally aggregated, as has been set forth.

It is believed that the purpose of this peculiar construction has been made apparent, the theory upon which I have been proceeding being that each portion of the tooth from *C* to *d* may be deflected to an equal degree under the ordinary circumstances of the use of said tooth, and that by diminishing the amount of the material in that portion of the tooth it may under the diminished strain be equally deflected.

I am aware that teeth with a slight curve and also that straight teeth have been made tapering. Therefore I do not claim, broadly, tapering rake-teeth other than when connected with teeth curved substantially as represented in Fig. 1, which teeth have functions not pertaining to the varieties of straight and slightly-curved teeth; but,

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

1. Grooving or hollowing the sides of the

tooth so that its thickness through its center on the line *d*, Fig. 3, may be less than on the lines *a b*, same figure, in order to place the greater amount of metal where it is needed to give effectiveness with economy of material.

2. The combination of the taper with the curve of the tooth, said taper extending from about the portion *C* to the point *d*, said curve being about a semicircle, so that by the combination of the taper and the curve the inward tractive power of the curve is gradually increased from the point *d* to about the portion *C*, substantially as herein described, and for the purpose set forth.

The above specification of my improvement in rake-teeth signed this 16th day of March, 1865.

A. B. SPROUT.

Witnesses:

EDWARD H. KNIGHT,  
CHARLES D. SMITH.