(No Model.)

W. R. DAVIE.

HARROW.

No. 428,895. Patented May 27, 1890.

Fig. 1.

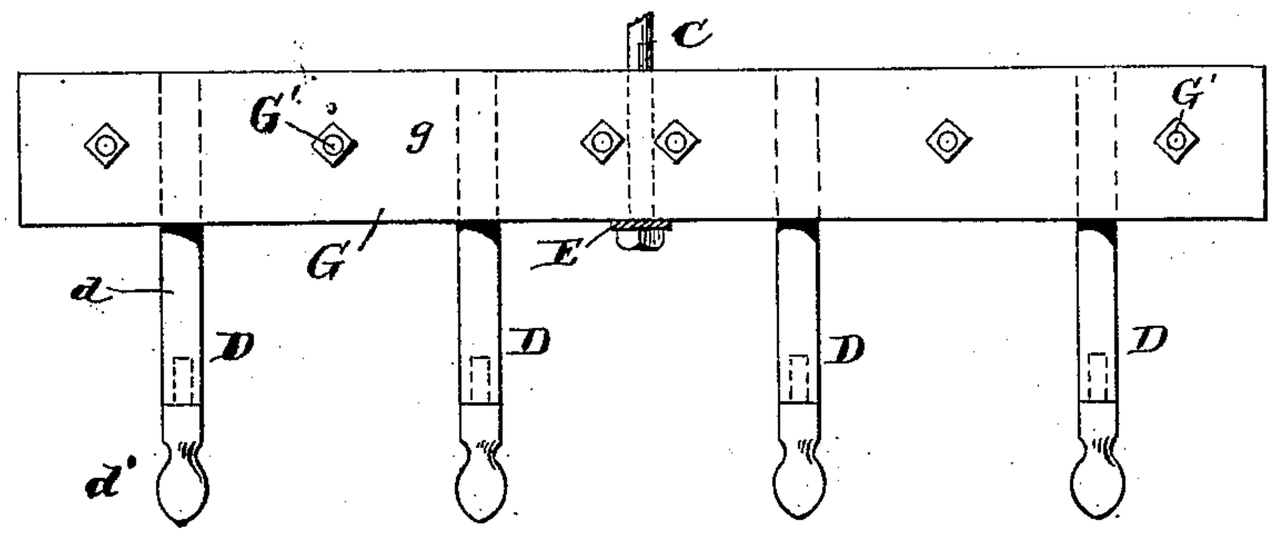


Fig. 2.

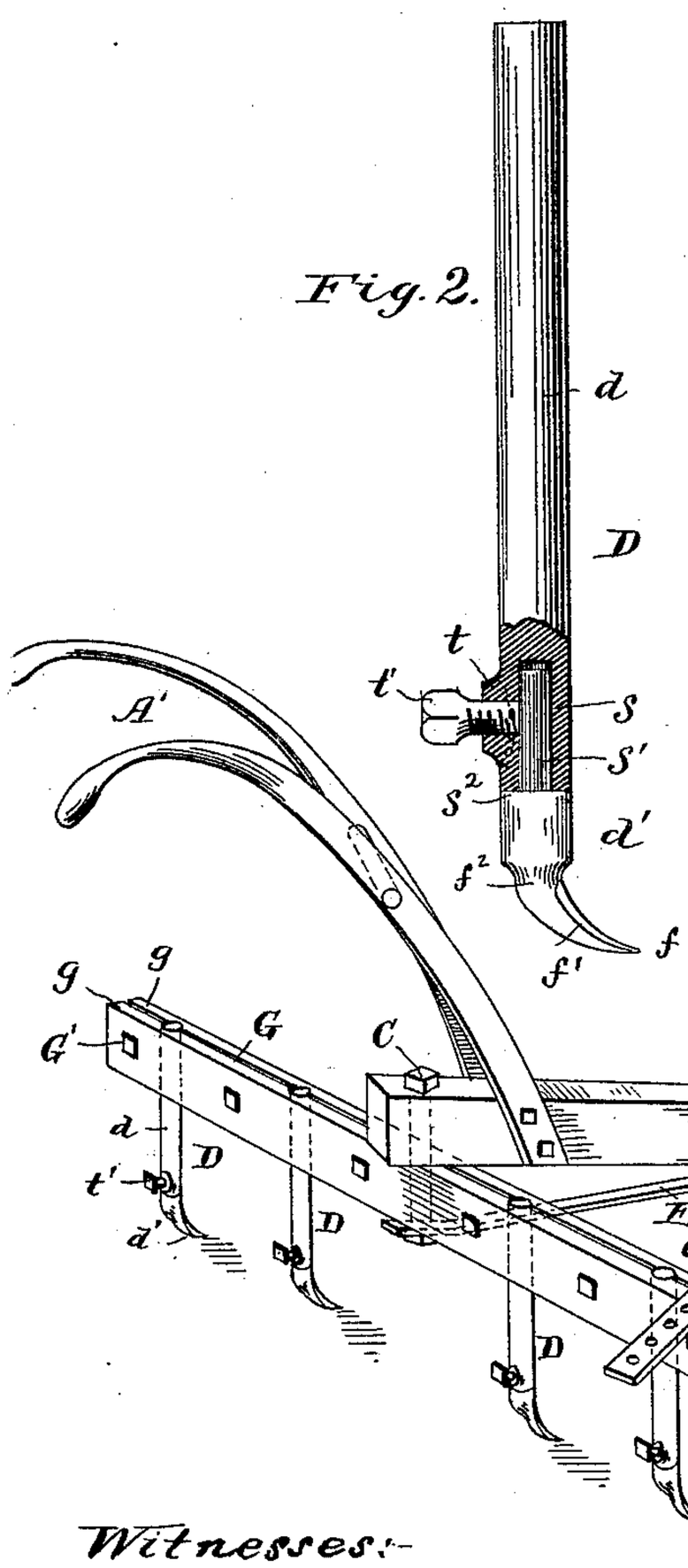


Fig. 3.

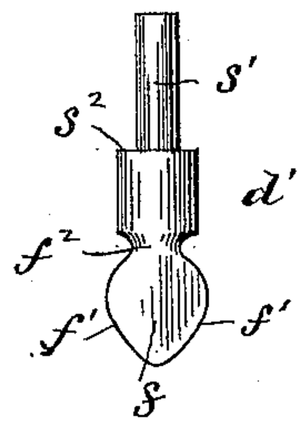
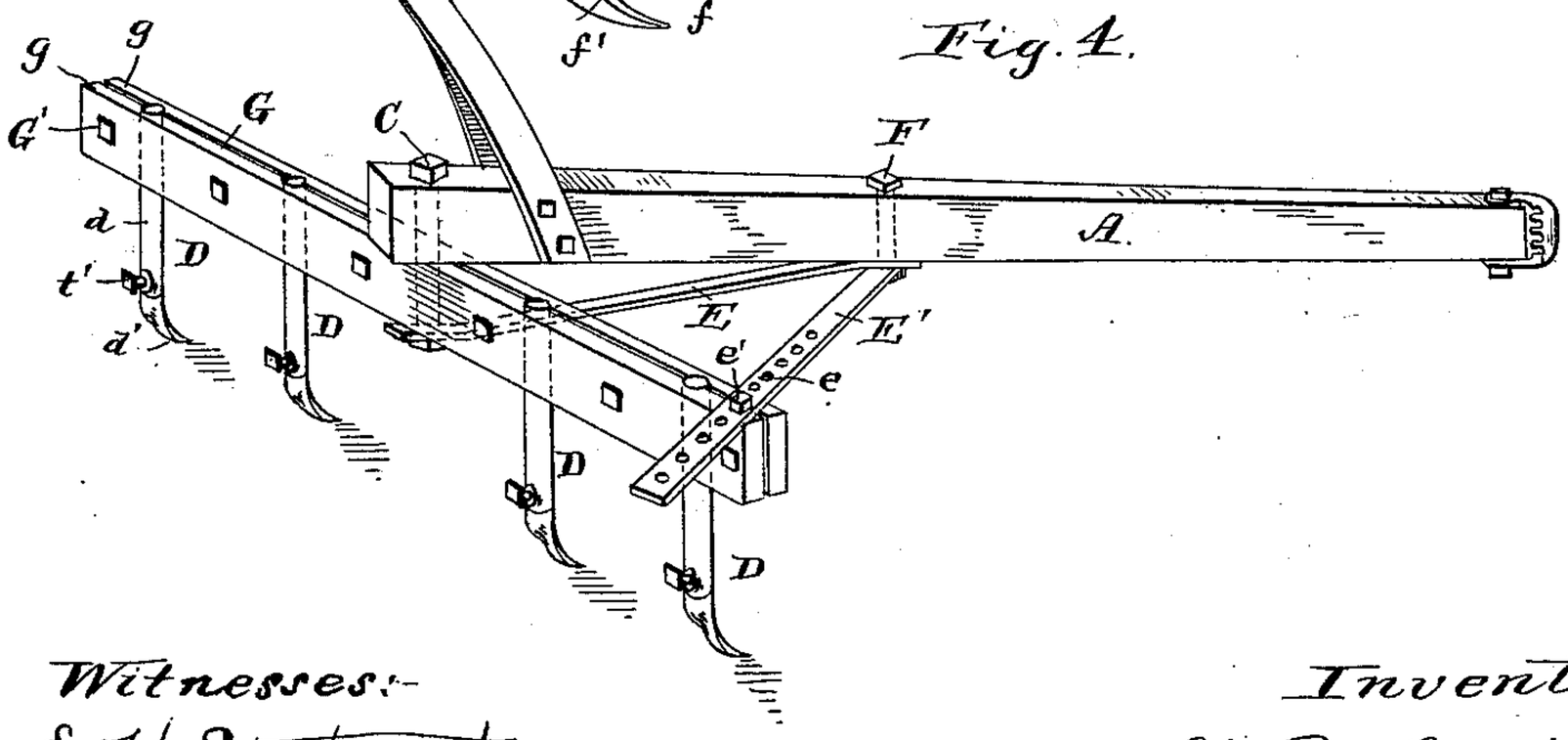


Fig. 4.



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UNITED STATES PATENT OFFICE.

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HARROW.

SPECIFICATION forming part of Letters Patent No. 428,895, dated May 27, 1890.

Application filed February 27, 1889. Serial No. 301,329. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM R. DAVIE, a citizen of the United States, residing at Landsford, in the county of Chester and State of South Carolina, have invented certain new and useful Improvements in Harrows; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My present invention relates to the peculiar construction and mode of attachment of harrow-teeth, with a view to secure various advantages of economy of manufacture, range of adjustment, ease of securing and detaching for purposes of sharpening or replacing old teeth without disturbing the permanent shank from its place in the head-block, and efficiency of operation in cutting, disintegrating, and stirring the soil.

It also relates to certain improvements in the harrow, whereby the latter may be readily adapted for close or open tillage, as may be desired, by an adjustment of the tooth beam or carrier relative to the line of draft.

My invention consists of the shank and detachable point formed as and provided with the means of attachment and adjustment hereinafter more particularly set forth.

It also consists in the harrow-frame having the tooth-carrier adjustable, as hereinafter more particularly set forth.

In order to make the invention more clearly understood, I have shown in the accompanying drawings a means for carrying the same into effect.

In said drawings, Figure 1 is a front view of the tooth beam or carrier of a harrow embodying my invention. Fig. 2 is an elevation, partly in section, of the shank and point detached from the carrier. Fig. 3 is a front view of the point or foot detached. Fig. 4 is a perspective view of a complete harrow embodying my improvements.

Referring to the drawings, D indicates the harrow-teeth, each of which is composed of a metal shank *d*, round, square, or of other suitable shape in cross-section, and a point or foot *d'*. The shanks *d* are securely and permanently fastened in a tooth beam or carrier G. The latter may be of wood or metal, and I have shown it as formed in two parts *g g*, between which the upper ends of the shanks are situated, and which are clamped together and upon said shanks by means of the transverse bolts G'. The lower end of the shank *d* is provided with a circular socket *s*, (see Fig. 2,) and with an enlargement or boss *t*, through which there is a horizontal screw-threaded perforation. A set-screw *t'*, correspondingly threaded, fits in said perforation, and is adapted to be screwed forward through the same, so that its forward end may reach or enter the socket *s*. The point or foot of the tooth (see Figs. 2 and 3) is formed at its upper end with a vertical stem *s'*, round in cross-section and adapted to fit the socket *s*.

s^2 is a shoulder formed at the base of the stem, upon which the lower end of the shank *d* rests, and which sustains, together with the shoulders of the other feet, the weight of the harrow. The lower portion of the foot consists of a forwardly-extending portion *f*, of greater width than the rest of the foot, and provided at its point and sides with cutting-edges *f'*. The said cutting portion of the foot terminates at its upper end in and is connected with the stem *s'* by a narrow neck f^2, adapted to encounter a relatively small resistance from the soil in the operation of the implement.

From the construction above described it will be seen that the feet or points of the teeth, while adapted to be securely held in any desired position, are readily removable for the purpose of sharpening or to permit of broken points being replaced by new ones without disturbing or removing from the tooth-carrier the main portions or shanks of the teeth. The points or feet may be readily adjusted to such angle relative to the line of draft as will properly correspond with the angle of the tooth-carrier and result in the desired action upon the soil and tillage.

Referring more particularly to Fig. 4, A indicates a beam or stock provided at its forward end with suitable draft attachments, and at its rear end with handles A', by which the implement may be guided. Beneath the rear end of the stock A is mounted the tooth

beam or carrier G, the latter being pivoted to the stock upon a vertical axis formed by the bolt C, which passes through both of said parts.

E E′ indicate two braces, the former attached at its rear end to the lower end of the bolt C and secured at its forward end to the under side of the stock A by means of the bolt or rod F. The second brace E′ is secured at its forward end to the stock in a similar or any other suitable manner, and extends rearward and outward to one end of the tooth-carrier G, to which it is detachably connected. The purpose of making this latter connection detachable is to permit of the swinging or adjusting of the tooth-carrier relative to the stock upon the pivot C for the purpose of altering the angle of said carrier relative to the line of draft and correspondingly affecting the closeness or openness of the tillage.

As already stated, the feet of the harrow-teeth are adapted to be correspondingly adjusted to secure the desired results. The tooth-carrier having been properly adjusted, it is then necessary to secure it in position, and this I preferably effect by providing the brace E′ with a series of holes *e*, any one of which is adapted to receive a pin or bolt *e′*, which passes through or is secured to the end of the tooth-carrier.

I am aware that it is not broadly new to secure cultivator-teeth by means of shanks fitting in cylindrical sockets and clamped by set-screws, as shown, for instance, in the patent to Campbell, No. 348,721, dated September 7, 1886. I am also aware that cultivator-teeth have been adapted to be secured to the frame by a shank screw-threaded at its upper end and provided with a nut. I therefore do not wish my claim to be understood as extending to such constructions.

Having thus described my invention, what I claim is—

1. In a harrow, the combination of the straight hollow standards or shanks *d*, having the set-screws *t′* and the feet *d′*, said feet and shanks constituting smooth and continuous teeth having the forwardly-projecting portions *f*, the shoulders s^2, and the shanks *s′*, all formed in a single piece, substantially as set forth.

2. The herein-described detachable harrow-foot, consisting of the forwardly-projecting portion *f*, having the cutting-edges *f′ f′*, the narrow neck f^2, the stem *s′*, and the supporting-shoulder s^2, the whole being formed in a single piece of metal, substantially as set forth.

In testimony whereof I affix my signature in the presence of two witnesses.

WILLIAM R. DAVIE.

Witnesses:
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