(No Model.)

F. MIDDLETON.

HOE AND RAKE.

No. 344,590. Patented June 29, 1886.

Fig. 1.

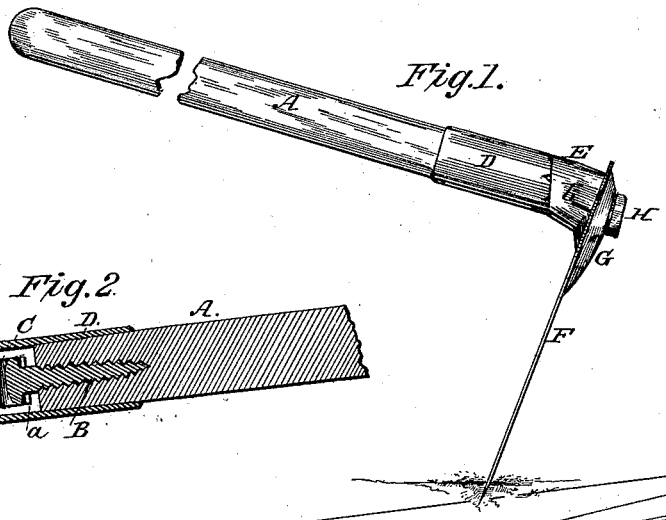
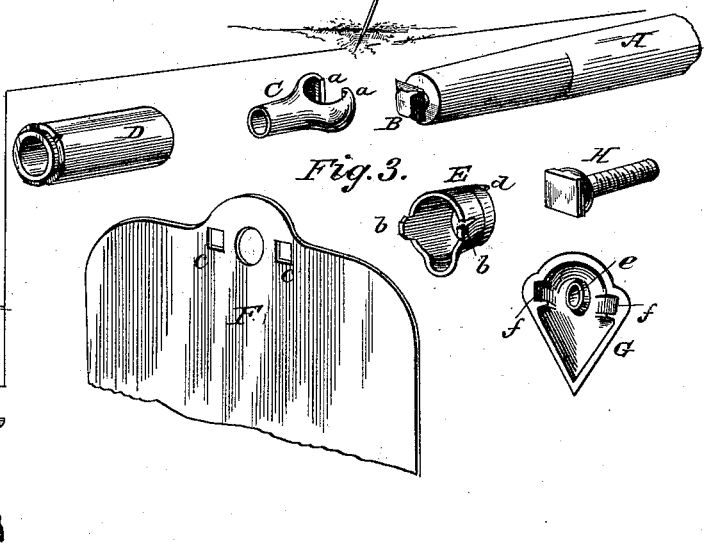


Fig. 2.



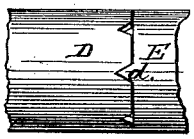


Fig. 4.

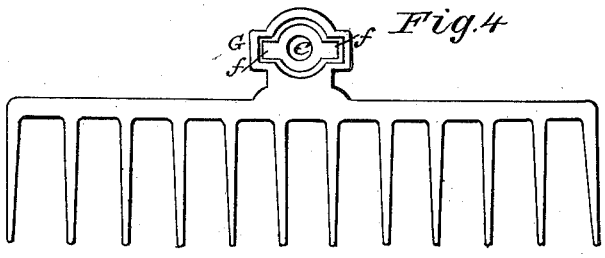
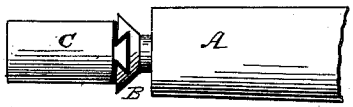


Fig. 5.



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FRANK MIDDLETON, OF RICHMOND, VIRGINIA.

HOE AND RAKE.

SPECIFICATION forming part of Letters Patent No. 344,590, dated June 29, 1886.

Application filed January 14, 1886. Serial No. 188,615. (No model.)

To all whom it may concern:

Be it known that I, FRANK MIDDLETON, a citizen of the United States, residing at Richmond, in the county of Henrico and State of Virginia, have invented a new and useful Improvement in Hoes and Rakes, of which the following is a description.

This invention is an improvement in that class of garden, field, and plantation hoes and rakes whose blades are secured to the handle by means of a screw-bolt.

One of the chief objects of the invention is to attach the blade and some connected parts to the handle by means of a screw-fastening, whose parts are covered and protected, so that dirt has no access, and the oil or other lubricant applied thereto is not liable to be washed out, and hence the parts are prevented from rusting and sticking so as to hinder easy adjustment.

The features of invention are as hereinafter described and claimed.

In accompanying drawings, Figure 1 is a side view of the hoe. Fig. 2 is a central longitudinal section. Fig. 3 illustrates all parts of the invention separately and in perspective, also one detail in plan. Figs. 4 and 5 show modifications.

The letter A indicates the handle; B, a lag-screw that enters the end of the handle; C, a nut attached to the head of said screw by means of hook-shaped flanges; D, a ferrule applied to the end of the handle and inclosing said screw and nut; E, a loose and adjustable eye; F, the hoe plate or blade; G, a detachable head; and H, a screw-bolt that passes through the head, blade, and eye, and enters nut C, thus securing the blade firmly in the required position.

I will now describe these parts more in detail. The slightly-tapered end of the handle A has a central axial screw-threaded bore, which receives the lag-screw B. The head of the latter is preferably made polygonal to adapt it for detachable connection with nut C, whose hook-flanges *a* embrace the sides of the screw-head. The ferrule D is tapered and rabbeted or shouldered at its smaller end to adapt it for connection with the eye E. The latter has lugs *b* in its front edge, which enter the holes *c c* in blade F, and its rear edge has one or more lugs, *d*, Fig. 3, that enter corresponding notches in the shoulder formed in the end of the tapered ferrule D. The function of both sets of lugs, *b d*, is to prevent rotation of the attached parts on each other. The eye E is shorter on one side than the other, so that the blade F is held normally set at a slightly acute angle to the handle. I prefer to provide its lower side and front edge with a lip to serve as a brace for the blade. The shouldered end of the ferrule D is inclined to the axis, and hence, by turning the eye and ferrule on each other, (or one on the other,) the blade F may be set at various other inclinations, as shown in dotted lines in Fig. 2.

The elongated detachable head or blade-strengthener, G, is made essentially concavo-convex in form, for the purpose of combining lightness and strength. It is applied to the outer side of the blade F, and arranged with its longer axis coincident therewith, in order to brace and stiffen it as much as practicable. A hole, *e*, is formed in the upper or larger end of the head G to receive the screw-bolt H, (which passes through it and enters the nut C,) and it is countersunk to accommodate the head of said bolt, whose inner side is rounded correspondingly. This construction is necessary in order to allow adjustment of the bolt, (relative to the head G,) which is incidental to adjustment of the blade F at different angles. It will be noted that the inner side of the head G has lateral sockets *f*, for reception of the lugs *b* of the eye E, to prevent the former from becoming displaced by turning around the bolt H independently of the blade F.

I will now briefly indicate the manner in which all the above-described parts are attached together. The lag-screw B is first inserted in the handle A, and the nut C applied to its head by sliding it laterally thereon. The ferrule E is next put in place and covers the screw and nut, as shown. The next step is to place the eye E and head G in proper relation on the respective sides of the blade F. Then pass the bolt H through the head, the central aperture in blade, and through the eye D, and screw it into the nut C, by which operation the ferrule D is forced farther onto the handle and the other parts fastened together and to the handle, so as to be immovable.

In applying the invention to a metal rake, I prefer to make the head G in one piece therewith, as shown, which construction se-

cures a very desirable combination of strength, lightness, and economy. It will be seen that the screw parts of the fastening are covered and protected, so that dirt cannot have access to them, and any lubricant applied thereto is not liable to be washed off. Thus the screw-parts are preserved uninjured and in condition to work easily together. The ferrule, being fixed on the handle, serves as a set-piece for the eye E and the hoe-blade. The latter is not merely adjustable as to its angle relative to the handle, and thereby also to the operator, but may be detached and reversed front to rear, in order to wear and change the bevel from one side to the other of the blade, and thereby sharpen the edge.

In order to reverse the blade the screw-bolt H is removed; but to change its inclination the bolt needs to be loosened only.

In further indication of the scope of my invention, it may be remarked that the required detachable, yet firm, connection between nut C and the head of lag-screw B may be effected by other constructions. For example, the screw-head might be provided with a dove-tail slot, and the nut with a tenon adapted to fit therein, as shown in Fig. 5. The arrangement of the apertures in the hoe-plate may also be varied. For example, they may be located one below and the other above the aperture for bolt B. The number of such holes may likewise be varied at will, so they correspond with lugs on loose eye and recesses in head G.

What I claim is—

1. The combination, with the lag-screw B, having a head, as specified, of the nut C, having claws for embracing the latter, but adapted for detachable connection therewith, so that the nut cannot rotate independently, the screw-bolt H, and the eye, ferrule, blade, and handle, all as shown and described.

2. The combination of the ferrule D and loose eye E with the lag-screw, the nut, the screw-bolt H, and the blade, whereby both the screw-fastenings are covered and protected, as shown and described.

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