May 2, 1933. W. L. GREIDER 1,907,153

FOREST FIRE FIGHTING RAKE

Filed April 28, 1931

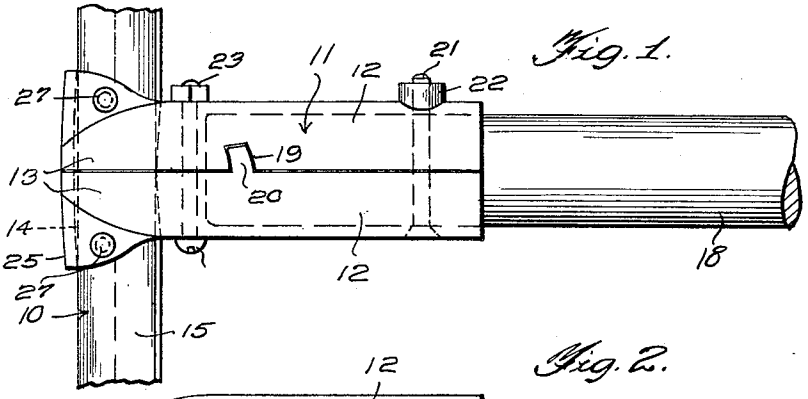


Fig. 1.

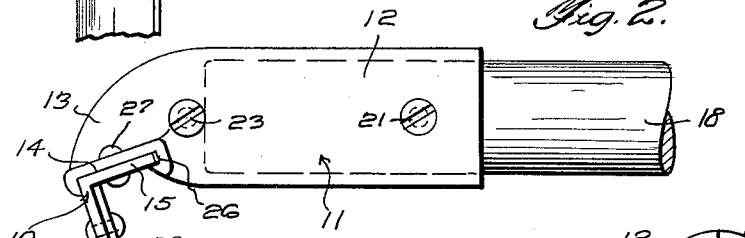


Fig. 2.

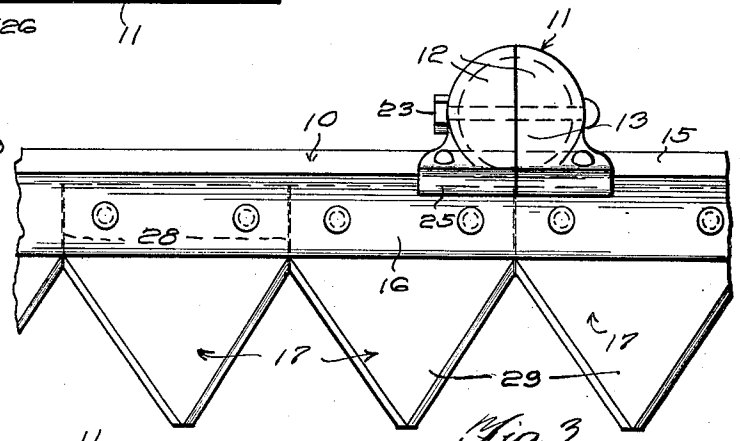


Fig. 3.

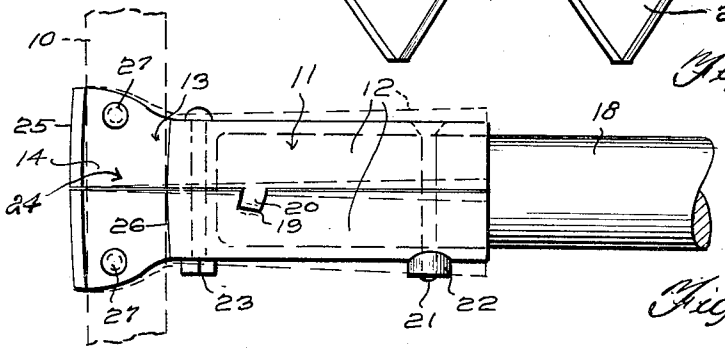


Fig. 4.

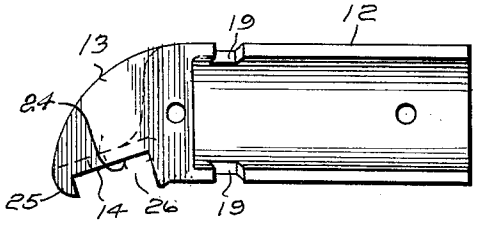


Fig. 5.

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UNITED STATES PATENT OFFICE

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FOREST FIRE FIGHTING RAKE

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The invention relates to rake constructions, particularly suitable for forest firefighting, although applicable to other uses as well. It is an aim of the invention to present a new construction in the head mounting or means for securing the head to the handle.

In such appliances, the use is often of an emergency nature, in extremely rough operations, involving the cutting of brush, as well as grubbing, cutting sod, and raking uses proper. The work is carried on among heavy stumps, stubs, rocks, and other objects which cannot be moved for the operation, and these are often struck with the tool, this liability being also increased by the necessity for rapid action without regard for the tool. As a result, there is frequent damage and breakage of prior handle connections, which it is an aim of my invention to minimize in a substantial degree. The handles are often broken and this cannot be avoided. But it is a purpose of my invention to enable the rapid replacement of handles with rough materials available at hand in the woods, such as saplings, or other rough stock, this stuff requiring no taper to fit my ferrule, and not requiring any axial boring of the handle to receive a tang or shank of the rake head, but enabling the satisfactory fitting of a handle securely with implements men ordinarily have at hand in such situations.

It is a further aim to present a head fastening which will secure the head with unusual rigidity and security. Another aim is to provide a head fastening of the two piece type in which certain deficiencies of prior appliances are overcome with resulting freedom from liability of looseness of the head in its angular relation to the handle, and minimizing of liability of loosening of the immediate connection between the ferrule and the rake head.

Additional advantages and features of invention reside in the construction, arrangement and combination of parts involved in the embodiment of the invention, one form of which is set forth in the accompanying description and shown in the appended drawing, wherein

Figure 1 is a top view of the rake,

Figure 2 is a side view thereof.

Figure 3 is a front view thereof,

Figure 4 is a bottom view of the ferrule,

Figure 5 is an elevation of the inner side of one of the ferrule sections before assembly on the rake.

There is illustrated a rake which comprises a head 10 which consists simply of a piece of stock steel angle, L-shaped in cross section and in practice having flanges about one-inch wide and of suitable thickness to make a rugged member for the uses indicated. A two-piece ferrule 11 is provided formed as a drop forging, preferably of malleable iron, steel or other malleable metal, divided in a vertical plane, each section including a socket portion 12 of semi-cylindrical form terminating at its forward end in a solid jaw 13 having a transverse channel 14 across the under side thereof, receiving snugly the top flange 15 of the head 10, the lower flange 16 of the head being pendant at the forward side of the head, and carrying the sheet steel planiform and triangular teeth or blades 17.

The socket is of suitable diameter to receive the untrimmed cylindrical end of a handle 18 of substantial size, without requiring the tapering thereof. For one form of the device the socket has an interior diameter of one and a quarter inches, and a length of approximately four inches within the socket portion. One section is formed with notches 19 in its longitudinal edges midway of the socket, while the other section has corresponding lugs 20 adapted to fit snugly into the notches respectively. The lugs and notches are preferably formed with parallel sides so that when an oversized handle is engaged in the socket and the two sections cannot be brought entirely into close abutting relation the lugs and notches will still prevent relative longitudinal displacement of one section with respect to the other. Such movement if permitted would involve displacement of the head of the rake from its right angle relation to the axis of the ferrule. With my formation of lug and notch they should be slightly curved, forming the segment of an arc having its center adjacent the extreme front end of the ferrule. This is

especially important since in replacement of a handle, it will be necessary to spring the rear ends of the ferrule sections apart to permit insertion of the new handle. There are alined openings through the rear parts of the ferrule to receive a bolt 21 secured by the nut 22. The bolt head is preferably countersunk in the ferrule and the nut may be elongated longitudinally of the handle for convenience in fastening it without a wrench, its under side being transversely concave so that it fits the curved surface of the ferrule and is thereby held against accidental loosening by striking brush and other objects ordinarily. A similar opening is formed through each section of the ferrule in the solid part immediately beyond the socket, and a bolt and nut engaged therethrough at 23.

The channel 14 is formed with a planiform bottom 24 in a plane at an angle of approximately 30 degrees to the axis of the socket 12. At the outer end of the jaw 13 the side of the channel forms a heavy lip 25 while at the inner side a shoulder 26 is formed of a height greater than the thickness of the flange 15 of the head. The lip is curved slightly transversely of the ferrule,—that is longitudinally of the channel 14—(see Fig. 4) so that a firm contact with the head and support thereof is assured at the extreme outer parts of the lip, and for other reasons, as will be explained.

The shoulder 26 is curved so that its central part next the head is convex longitudinally of the channel, resulting in a bearing contact between the rear edge of the head flange 15 and the shoulder 26. As stated also, this shoulder is initially much higher than the flange, and by reason of the ferrule being of malleable metal, after assembly of the head and ferrule, the shoulder may be hammered down to overhang and forcibly abut the rake head and add to its security of emplacement. The jaw portion over the channel is thickened gradually at its central part upward, the channel 14 being entirely below the axis of the ferrule, but the material of the ferrule over the channel is flattened at the lateral parts, and apertured to receive rivets 27 engaged through the top flange of the rake head. The jaw portion is considerably broadened to further enhance the rigidity of the head in its angular relation to the ferrule, and, after assembly, the lip 25 is peened to assure good contact over an adequate area, as well as to increase the tight fit of the jaw on the head.

The front or lower flange 16 of the rake head has riveted thereto a series of teeth or blades 17 in the form of planiform plates having rectangular base portions 28 secured to the head of an altitude slightly greater than that of the flange 16 to which they are secured. The outer or blade portions 29 of the teeth are each in the form of a truncated triangle, the edges being bevelled at the forward side (that is, away from the handle), including the short horizontal edge on the point of the tooth. It is important to note that the side edges of the blades meet a distance below the edge of the flange 16, so that in cutting small brush and weeds there will be no obstruction to the engagement of the stalks by the cutting edge of the blade.

In the use of this appliance it is customary to use it as a hoe, as a sod cutter, stalk chopper and brush cutter, and in firefighting in dense woods with underbrush and leaves it is especially useful. The angular relation of the plane of the bottom of the channel 14 to the axis of the ferrule, gives the blades the best set for effective use as involved.

In the use of the article also, it retains a permanent rigid relation of the head to the handle under use of extreme severity, and the handle will break before the head can be changed in its angular relation to the handle, by use in the ordinary ways.

For replacement of a handle, the nut 23 is loosened, the bolt 21 removed and the butt of the old handle removed by spreading the sections of the ferrule apart. The new handle transversely bored is then introduced between the ferrule sections and the two parts of the ferrule brought together upon the inserted butt. The bolt 21 being inserted and the nut 22 put on, the latter is tightened until the handle is firmly clamped in the ferrule, after which the nut 23 is also tightened. This enables the use of crudely formed handles including mere fresh-cut saplings or other rough poles. The butt may even be slightly knobbed but with filler strips at the outer part of the socket it may still be rigidly clamped in the ferrule. It is an advantage that only the formation of the transverse bore in the butt is required in the way of tool work, and this bore may be formed by means of the simplest tools, such as the scout knife, or gimlet, with a minimum of time. The avoidance of necessity for peculiar trimming to fit a tapered ferrule is a material advantage. The replacement of a broken handle is often required at a moment of emergency, and with my construction such replacement may be effected without excessive delay.

In the assembly of the device the peculiar formation of the lip and shoulder on the jaw are of peculiar advantage, and they are also of peculiar advantage in replacement repairs similarly, as will be explained. Thus, between the extreme lateral part of the lip and the diagonally opposite inner shoulder portion 26 on each section there is a much greater distance than between the lip and shoulder on a line at right angles to the channel. Consequently, when the end or half socket portions of the ferrule are separated and positioned divergently those parts of the lip and shoulder which are to bind against the head 10 are separated sufficiently to enable the head to set loosely therebetween, and when the ends

are brought together again the diagonally spaced portions are caused to bind forcibly on the head and slightly spring it. Actually the longitudinal axis of each channel portion is at an oblique angle to the longitudinal axis of the ferrule complete, and they converge toward the outer side of the channel. In replacing a handle this permits easier separation of the socket portions and more certain snug engagement of the jaw portions with the head on restoration of the socket parts to original close abutting relation. In the event that the socket is not entirely closed any lack of tight engagement may be compensated for by peening the lip 26 and the shoulder 25, which is a simple operation.

It will also be appreciated that the engagement of the central shoulder portion 26 with the edge of the flange 15 prevents relative longitudinal displacement of the two sections of the ferrule in cooperation with the lug and notch before referred to.

I claim:—

A firefighting tool and the like comprising a head, a ferrule having a jaw embracing the head and formed in two parts having opposed half sockets adapted to be secured together upon an interposed handle, the jaw being formed with a transverse channel receiving the head, said channel having a longitudinally concave outer side and a longitudinally convex inner side, and means to secure the two parts together upon a head and an interposed handle.

In testimony whereof I affix my signature.

WESTLEY L. GREIDER.