Dec. 16, 1958 E. W. FOHR 2,864,184

SCARIFIER TOOTH ATTACHMENT FOR END LOADER BUCKETS

Filed May 10, 1955

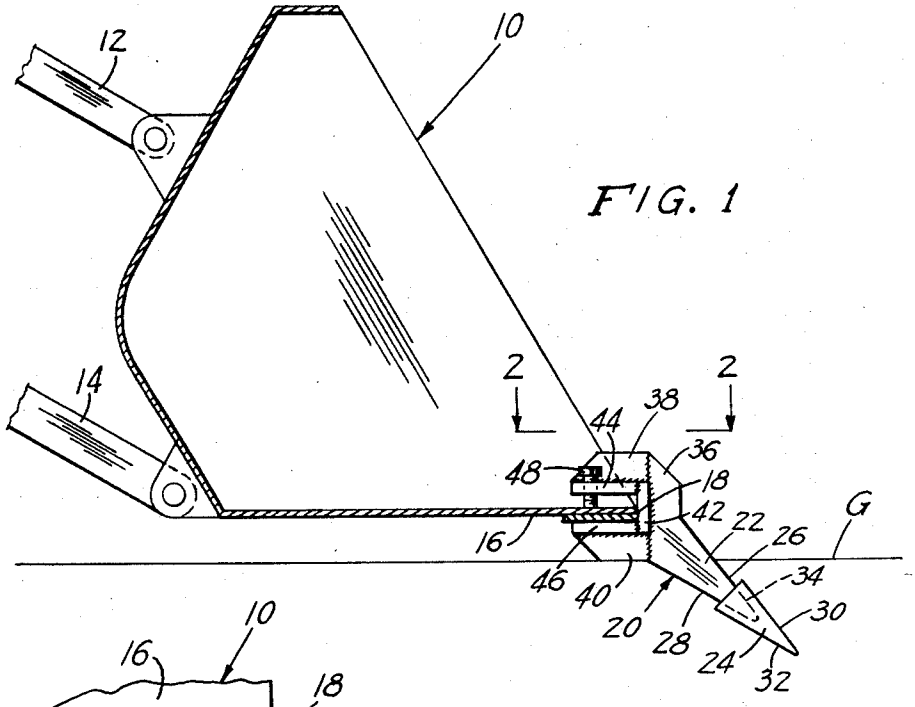


FIG. 1

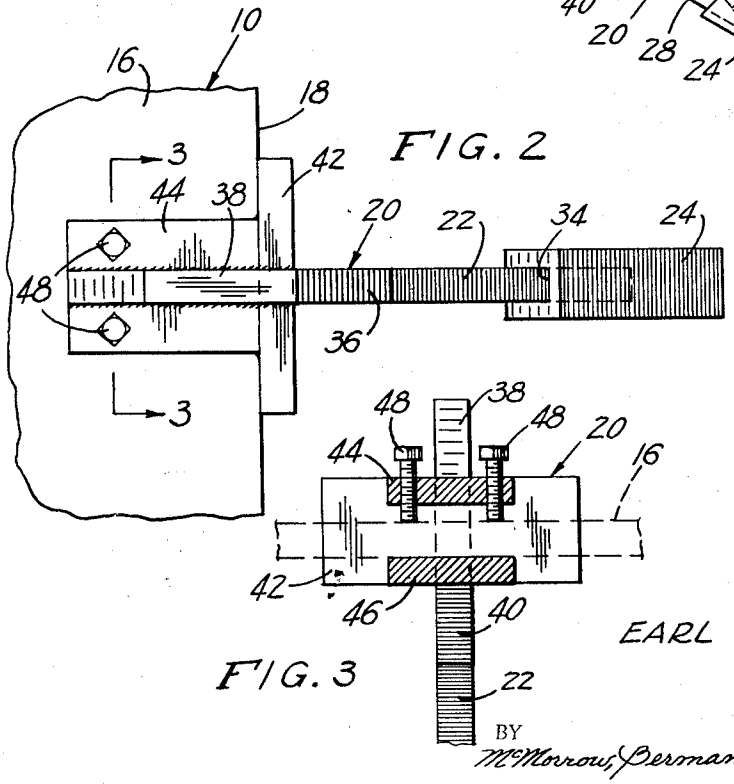


FIG. 2

FIG. 3

INVENTOR
EARL W. FOHR

BY
McMorrow, Berman & Davidson
ATTORNEYS

United States Patent Office

2,864,184

Patented Dec. 16, 1958

2,864,184

SCARIFIER TOOTH ATTACHMENT FOR END LOADER BUCKETS

Earl W. Fohr, Milwaukee, Wis.

Application May 10, 1955, Serial No. 507,221

1 Claim. (Cl. 37—142)

This invention relates to earth moving or excavating equipment, and more particularly has reference to a scarifier tooth attachment, adapted to be removably connectable to a front end loader bucket, such as is mounted on certain wheeled or tread type earth moving machines.

Such machines are equipped with loader buckets having bottom plates terminating at their front ends in cutting edges. In scooping up earth, the edges dig into the earth, so as to load the earth into the bucket. In this connection, in many instances the earth is packed so hard, or may include rocks of so substantial a size, as to resist penetration thereof by the cutting edge. Accordingly, it is desirable to include, in the equipment, a scarifier means in the form of one or more sharply pointed digging teeth, that will break up or loosen the hard packed earth in advance of the cutting edge, to facilitate penetration of the earth by the cutting edge. In this way, there is an easier and faster removal of the material.

While a tooth attachment of the type referred to above is not, per se, new, the main objects of the present invention are to provide a particularly strong interengagement of the tooth and bucket, that will insure against relative breakage or damage of these parts, while at the same time providing an attachment that will be swiftly connectable to or disconnectable from the bucket with a minimum amount of difficulty; will be simply designed so as to permit manufacture at low cost; will be locatable at any point along the cutting edge, in any selected number or in any selected spacing arrangement; and will, further, be capable of attachment to buckets of different shapes, sizes, and bottom plate thicknesess.

Other objects will appear from the following description, the claim appended thereto, and from the annexed drawing, in which like reference characters designate like parts throughout the several views, and wherein:

Figure 1 is a vertical sectional view through a front end loader bucket equipped with a tooth attachment formed according to the present invention, said attachment being illustrated in side elevation;

Figure 2 is an enlarged view on line 2—2 of Figure 1, showing the tooth attachment in top plan; and

Figure 3 is a transverse sectional view through the tooth attachment on line 3—3 of Figure 2.

At 10 there has been generally designated a conventional front end loader bucket, connected to lifting arms, 12, 14, which arms are hydraulically controlled, for the purpose of elevating the bucket, tilting it in any position to which it is lifted or dropped, and otherwise controlling the bucket movement and positioning. The bucket includes the usual bottom plate 16 terminating at its front end in a cutting edge 18 which is adapted to penetrate the earth to be loaded into the bucket.

The tooth attachment constituting the present invention has been generally designated at 20, and as one component thereof includes an elongated tooth member 22. The tooth member 22 is formed of flat bar stock, set

edgewise, that is in a normally vertical plane, and is pointed at its front end. The pointed front end of the tooth member is adapted to be received in an end bit 24, formed as a sheath having a rearwardly opening socket receiving the tip of the tooth. The tooth member has flat top and bottom surfaces 26, 28 disposed at a sharp acute angle to one another and converging to form the pointed end of the tooth member. The end bit has corresponding top and bottom surfaces 30, 32, in parallelism with the top and bottom surfaces of the rearwardly opening socket 34 of the tip. The tip, of course, is formed of a particularly strong metal material and is removable whenever it becomes blunted by repeated usage.

Integrally formed upon the rear end of the tooth member 22 is an upwardly projecting extension 36, and welded to the upper end of said extension is a rearwardly projecting, horizontally disposed gusset 38 lying in a vertical plane. Coplanar with gusset 38 is a lower gusset 40, also projecting horizontally, rearwardly from and welded to the extension 36 in spaced relation to gusset 38.

An elongated, rectangular cross bar 42 of substantial height is extended transversely of the tooth member, projecting laterally in opposite directions from the tooth member as shown in Figure 2. The cross bar 42 lies in a plane normal to that of the tooth member and gussets, and is welded to the extension 36 and gussets in the space between the gussets.

The cross bar is so disposed as to constitute an abutment, extending in longitudinal contact with the cutting edge 18 of the bottom plate 16, thus to provide particularly high resistance to rearward movement of the scarifier tooth attachment relative to the end loader bucket, when said tooth is being urged forwardly into the hard packed earth for the purpose of loosening the same.

Upper and lower clamp arms 44, 46, formed from short lengths of flat, wide bar stock, are spaced vertically of one another in horizontal planes, and are welded at their inner ends to the top and bottom edge portions of the cross bar, medially between opposite ends of the cross bar. In the upper clamp arm 44, at opposite sides of the common plane of the gussets, there are formed threaded, parallel openings, receiving clamping screws 48, 48. The screws 48 are adapted to be turned home against the top surface of the bottom plate 16, to clampably engage the bottom plate between the screws and the lower clamp arm 46.

In some embodiments of the invention, it may be desirable to mount the clamp arm 44 for vertical adjustment upon extension 36 in respect to the lower clamp arm 46, thus to adapt the tooth attachment for receiving the bottom plates of not only large but small machines having bottom plate thicknesses substantially less than those of the buckets of large, heavy duty machinery. This is believed sufficiently obvious as not to require special illustration herein.

In use, one or more of the tooth attachments is secured to the bottom plate, at any desired locations along the cutting edge 18. Thus, a single tooth can be provided medially between the opposite sides of the loader bucket. Alternatively, the teeth can be used in sets, with the teeth spaced selected distances apart along the cutting edge. In still other usages, it may be desired to provide a single tooth, adjacent the right or left hand end of the cutting edge.

An important characteristic of the invention resides in the ease of its connection to or disconnection from the bottom plate. Ordinarily, a clamp type connection, used for mounting the tooth attachment on bottom plates

differing from one another in respect to the thickness thereof, would tend to promote looseness or lack of strength in the interengagement between the bottom plate and the tooth attachment. However, the provision of the elongated cross bar, extending as the bight portion of the U-shaped clamp means defined by said cross bar and the clamp arms **44**, **46**, counteracts this tendency, since the cross bar extends as an abutment of substantial size in full engagement with the cutting edge **18**. This is true regardless of the thickness of the cutting edge, since the lower edge portion of the cross bar will in all instances be disposed below the plane of the bottom plate **16**, and the upper edge portion of said cross bar will be similarly elevated above the plane of the top surface of bottom plate **16**. As a result, the abutment, disposed directly crosswise to the back pressure exerted by the tooth on the bucket as the tooth penetrates the hard earth, effectively counteracts any tendency of the attachment to develop looseness upon the bucket, and assures a strong, tight connection between the bucket and tooth attachment at all times.

It is believed apparent that the invention is not necessarily confined to the specific use or uses thereof described above, since it may be utilized for any purpose to which it may be suited. Nor is the invention to be necessarily limited to the specific construction illustrated and described, since such construction is only intended to be illustrative of the principles, it being considered that the invention comprehends any minor change in construction that may be permitted within the scope of the appended claim.

What is claimed is:

A scarifier tooth attachment for a loader bucket having a bottom plate formed with a cutting edge, comprising: a flat, elongated tooth member adapted to project forwardly from said cutting edge and pointed at its front end, said member having straight top and bottom surfaces converging in a forward direction and both declining in said forward direction, said member lying in a vertical plane and being formed integrally at its rear end with a flat, upwardly projecting extension having a vertical front edge merging into said upper surface, and

having a forwardly declining top edge merging into said front edge, said extension lying in said plane; a flat, elongated cross bar rigid with and extending transversely of said tooth member at the rear end thereof in a vertical plane normal to the plane of the tooth member, to provide an abutment extending along said cutting edge in contact therewith, said cross bar being rigidly connected to said extension below the upper end of the extension; and clamp means projecting rearwardly from said cross bar adapted for gripping the bottom plate adjacent the cutting edge thereof, comprising spaced clamp arms lying in vertically spaced, horizontal planes and rigidly connected to the top and bottom edges of the cross bar to cooperate with the cross bar in defining between the arms a slot receiving said bottom plate, vertically spaced, flat gussets rigid with the respective arms, said gussets being rigid with and extended rearwardly from the tooth member and extension respectively and lying in the common plane of the tooth member and extension, one gusset rigid with the tooth member having a horizontal bottom surface merging into the bottom surface of the tooth member, the other gusset having a horizontal top surface merging into said top edge of the extension, the gussets having rear end edges converging rearwardly and terminating at the rear ends of the respective clamp arms, and clamping bolts threaded in one of said clamp arms and extending into said slot to engage the bottom plate between the bolts and other arm.

References Cited in the file of this patent

UNITED STATES PATENTS

1,197,104	Clark	Sept. 5, 1916
1,249,402	Hovey	Dec. 11, 1917
1,435,920	Greenleaf	Nov. 21, 1922
1,796,737	Van Buskirk	May 23, 1929
1,986,853	Rauch	Jan. 8, 1935
2,688,910	Adair	Sept. 14, 1954
2,699,601	Darnell	Jan. 18, 1955
2,705,380	Hensley	Apr. 5, 1955