ROOTER FOR BULLDOZER BLADES

Filed May 14, 1956

S. F. BIERWITH ET AL.

2,852,875

INVENTORS

S. F. BIERWITH

AND H. G. LIVERMORE

BY

ATTORNEY
The invention relates to a rooter comprising a scarring attachment for bulldozer blades, and more particularly relates to a novel means for mounting such a rooter on a bulldozer moldboard.

In providing rooting elements on the moldboard blades of the working heads of bulldozers, or the like, it has heretofore been customary to mount such elements for their complete removal while not in use, as when a bulldozer blade is operating in loose material. Since, however, the ground-working requirements for a bulldozer blade may vary appreciably at different working points, a removed rooter may be needed on short notice and must then be recovered from its point of last removal, thus involving a marked waste of time. Also, rooter assemblies for use with bulldozer heads usually weigh several hundred pounds, which fact imposes another handicap in rooter-dismounting and replacement proceedings. In accordance with the present invention, however, a major purpose is to provide for the constant carrying of a rooter on the bulldozer head while it is retained in either working or non-working position thereon, whereby to facilitate its use by minimizing its required handling between periods of its use.

Another object of the invention is to provide an improved and simplified means for retainingly mounting a rooter of the character described in either working or non-working positions on a bulldozer moldboard.

A further object is to retainably mount the rooter on a moldboard in such a manner that its inoperative disposal may be simply effected by swiveling it away from its working position to a non-working position across the upper part of the moldboard.

An added object is to provide for the independently settable attachment of a plurality of rooters to the same moldboard.

The invention possesses other objects and features of advantage, some of which, with the foregoing, will be set forth or be apparent in the following description of a typical embodiment thereof, and in the accompanying drawings, in which:

Figure 1 is a perspective view disclosing a pair of rooter elements retainedly mounted on the moldboard blade of a fragmentally shown usual working head of a bulldozer by the rooter-mounting means of our invention.

Figure 2 is a front view of the assembly of Figure 1, with the different rooters shown as respectively secured in operative and inoperative positions on the moldboard blade.

Figure 3 is a plan view of the assembly of Figure 2.

Figure 4 is an enlarged section taken at the line 4—4 in Figure 1.

Figure 5 is a view taken from the line 5—5 in Figure 2, and showing a present rooter element having its portion free of the bottom working edge of the moldboard.

Figure 6 is an enlarged fragmentary section taken from the line 6—6 in Figure 1.

Figure 7 is a view similar to that of Figure 5, but showing a rooter element fully secured to the moldboard blade.

For purposes of illustration, the device of our invention is shown as applied for the mounting of one or more unitary rooter elements on the moldboard blade B of a usual bulldozer head H, said blade being suitably shaped of a metallic plate and presenting a cylindrically concave front working face F and extending between an undamaged top edge B' and a thickened (reinforced) working edge portion B". As shown, an element 11 comprises an intermediate shank portion 12 having a point portion 13 and a uniform round and externally threaded stem portion 14 extending integrally from opposite ends thereof. The shank portion 12 is of rectangular cross-section and is tapered to have its larger end at the juncture of the shank with the point portion 13 which is also of rectangular cross-section and tapers to its working tip and extends angularly forwardly from the line of the shank. The rearward part of the point 13 immediately adjacent its juncture with the shank is provided with a V notch 15 for receiving the working edge B" of a bulldozer blade B having its upper edge B' adjacent and opposite the stem portion 14 of the element 11; as shown, the V notch 15 is provided by a cross-member 16 which comprises an original or integrally attached part of the point. While such is not shown, the tip portion of the point 13 may replaceably mount an enclosing wear tip secured to it in a suitable manner.

Means are provided for fixing the element 11 to the blade B while the working edge B" of the blade is seatedly engaged with the element notch 15, such means engaging the element at its stem portion 14 and comprising an assembly 17 which is mounted on the blade B at its top edge B'. As particularly illustrated, the assembly 17 comprises a base member 18 fixedly mounted on the top edge B' of a blade B, with the underside of said member formed to engage the top edge B' with the rear face of the blade B in complementarily fitted relation thereto; in the present instance, in which a pair of rooter elements 11 is mounted on the same blade B, the base elements 18 are welded to the upper blade portion at like distances from the side edges of the blade. A tubular upper portion 19 of a base 18 provides a bore 21 in which the stem 22 of a fork element 23 is journeled with the arms 24 of the fork extending forwardly of the base 18. The stem 22 extends rearwardly from the base portion 19, and the extending stem portion mounts a collar 25 joined to it whereby the fork is swiveled to the base between the collar 25 and the shoulder 26 provided at the rear end of the fork arms in perpendicular relation to the stem axis.

It will now be noted that the opposed faces of the fork arms 24 are mutually parallel and receive between them a more or less cylindrical block member 27 having coaxial trunnions 28 extending from its ends and engaged in aligned bearing bores 29 provided in the fork arms 24 to provide for a rocking of the block about an axis which is perpendicular to and is intercepted by the axis of the fork stem 22. Diagonally thereof, the member 27 is intermediateally provided with a transverse opening 31 having a uniform circular cross-section which is slightly larger than that of the stem portion 14 of the element 11, whereby said opening may freely receive said stem portion therein. When the threaded rooter stem 34 extends through the opening 31 of the block member 27, it is arranged to mount a cap nut 32 having its open end bearing against the block whereby the degree of extension of the rooter stem through the opening 31 may be accurately controlled while the rooter is supported from the nut. In this manner, a tightening of the nut 32 on the stem 22 may cooperate with the seating of the bottom
blade edge B" in the notch 15 of the rooter to produce a clampedly set mounting of the rooter on the blade.

Understanding that the described securing assembly 17 for the stem end of a rooter 11 effectively comprises a universal joint between the stem and blade, a rooter which has been lowered from its blade-mounted position by the means put forth in 32 of the stem 32 to free its blade 1 B" at the notch 15 from the blade edge B" may be swung slightly forward (Figure 5) to clear it from said blade edge and then permit its swinging upwardly to a position opposite and along the front face F of the blade for its engagement with a forwardly extending support bracket 34 and the top of the blade B for engagement by either or both of the rooters 11 which are shown as mounted on the blade, and essentially provides a forwardly directed rest arm 35 which is adapted to supportably engage either or both of the rooters at shank points thereof. The present bracket 34 is of one-piece construction and provides a cross-groove 36 which is arranged to complementarily receive the upper edge portion B' of the blade B at a point immediately of the assemblies 17, the set bracket 34 being suitably fixed in mounted position on the blade by welding or another means.

The arm 35 of the bracket 34 is long enough to provide a retaining depression 37 between the bracket portion 38 providing the groove 36 and an upwardly formed terminal flange 39, with said depression 37 wide enough to simultaneously receive both rooter shanks within it. As particularly illustrated in Figures 2 and 3, a rooter element 11 has been subjected to a ninety degree rotation as between its lowered working position and its raised inoperative position, whereby to maintain the center of gravity of the rooter as close as possible to the blade B. Understanding that the present device of constantly associating a rooter, or rooters, with a bulldozer blade B is highly advantageous for facilitating the use or non-use of a rooter tooth, the present arrangement has other notable advantages. Thus, the weight of a tooth being moved between its use and non-use points on the mounting bulldozer head is supported in part from the universal hinging assembly 17, whereby movements of the tooth between operative and non-operative positions with respect to a blade will never require a manual support of the full weight of the tooth, as would be the case in handling a tooth which is entirely free of a head with which it is to be used. Furthermore, the weight added to a bulldozer head by one or more inoperatively disposed rooters 11 carried thereon is advantageous as providing an increased penetration for the working edge B" of the blade.

From the foregoing description taken in connection with the accompanying drawings, the advantages of the present rooter for bulldozer blades will be readily understood by those skilled in the art to which the invention appertains. While we have shown and described a structure and arrangement which we now consider to be a preferred embodiment of our invention, we desire to have it understood that the showings are primarily illustrative, and that such changes and developments may be made, when desired, as fall within the scope of the following claims.

We claim:
1. In combination with the moldboard of a bulldozer or the like, an elongated rooting element for operative disposal in upright position opposite the front face of the moldboard in releasably clamped relation thereto and providing a terminal rooting tooth at an end of its shank for operation below the bottom edge of the moldboard, and a pivotal connection means carried by the moldboard adjacent its top and engaged by the shank of said rooting element for a swinging of the released element between its upright working position and an inoperative position across the front of the moldboard adjacent its top.

2. In combination with the moldboard of a bulldozer or the like, an elongated rooting element for operative disposal in upright position opposite the front face of the moldboard in releasably clamped relation thereto and providing a terminal rooting tooth at an end of its shank for operation below the bottom edge of the moldboard, and a pivotal connection means carried by the moldboard adjacent its top and engaged by the shank of said rooting element for a swinging of the released element between its upright working position and an inoperative position across the front of the moldboard adjacent its top.

3. In combination with an upright moldboard of a bulldozer or the like, an elongated rooting element for operative disposal in upright position opposite a face of the moldboard in releasably clamped relation thereto and comprising a shank provided with a terminal rooting tooth at one end for its operative extension below the bottom edge of the moldboard and providing a uniform stem extending from its other end, a fork member fixedly mounted on the moldboard adjacent its top and having its stem swiveled thereto with its arms extending forwardly from said mold-board face, a member rotatably engaged with and between the arms of the fork member for rotation about an axis in the plane of the fork arms and providing an opening for freely and rotatively receiving said stem of the rooting element, and means cooperative between said last member and the stem engaged in said opening of the member for longitudinally adjusting the position of the stem in the opening.

4. In combination with an upright moldboard of a bulldozer or the like, an elongated rooting element for operative disposal in upright position opposite the forward face of the moldboard and releasably clamped relation thereto comprising a shank provided with a terminal rooting tooth at one end arranged for its operative extension below the bottom edge of the moldboard and provided with a uniform stem extending from its other end, a fork member fixedly mounted on the moldboard adjacent its top and having its stem swiveled thereto with its arms extending forwardly from said moldboard face in a plane including the axis of its stem, a block member rotatably engaged with and between the arms of the fork member for rotating about an axis in the plane of the fork arms and stem and providing an opening for freely and rotatively receiving said stem of the rooting element, and means cooperative between said block member and the received stem for longitudinally adjusting the position of the stem in the block opening.

5. In combination with an upright moldboard of a bulldozer or the like, an elongated rooting element for operative disposal in upright position opposite a face of the moldboard and comprising a shank provided with a terminal rooting tooth at one end and providing a uniform terminal stem at its other end and a V notch intermediate thereof for receiving the bottom edge of the moldboard when the rooting element is operatively mounted on it, and a connection means carried by the moldboard adjacent its top and supportably and adjustably engageable by the stem of said rooting element to provide for a clamping engagement of the moldboard between the means and said V notch to clamp the rooting element in operative relation to the moldboard and for a release of the mounted rooting element for its swinging to an inoperative position across the moldboard.

6. In combination with the moldboard of a bulldozer or the like, an elongated rooting element for operative disposal in upright position opposite the front face of the moldboard in releasably clamped relation thereto and comprising a shank provided with a terminal rooting tooth at an end of its shank for operation below the bottom edge of the moldboard, and an attaching means carried by the moldboard adjacent its top and engaged by the shank of said rooting element for a swinging of the released element between its upright working position and an inoperative position across the moldboard.
position across the moldboard and transverse to the said working position of the element.

7. In combination with the moldboard of a bulldozer or the like, an elongated rooting element for operative disposal in upright position opposite a face of the moldboard in releasably clamped relation thereto and providing a terminal rooting tooth at an end of its shank for operation below the bottom edge of the moldboard, an attaching means carried by the moldboard adjacent its top and engaged by the shank of said rooting element for a swinging of the released mounted element between its upright working position and an inoperative position across the moldboard and transverse to said working position of the element, and means directly cooperative between the rooting element and the moldboard for alternately and releasably securing the rooting element in either aforesaid mounted position thereof on the moldboard.

8. In combination with an upright moldboard of a bulldozer or the like, an elongated rooting element for operative disposal in upright position opposite a face of the moldboard and comprising a shank provided with a terminal rooting tooth at one end and providing a V notch immediately thereof for receiving the bottom edge of the moldboard when the rooting element is operatively mounted on it, and a connection means on the moldboard adjacent its top and adjustably engageable with the shank of said rooting element to provide for a clamping engagement of the moldboard between the means and said V notch to clamp the rooting element in operative relation to the moldboard and for a release of the mounted rooting element for its swinging to an inoperative position on and across the moldboard.

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