Jan. 2, 1951 L. C. PEIRCE 2,536,308

ADJUSTABLE RIPPER TOOTH FOR BULLDOZERS

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Fig. 2

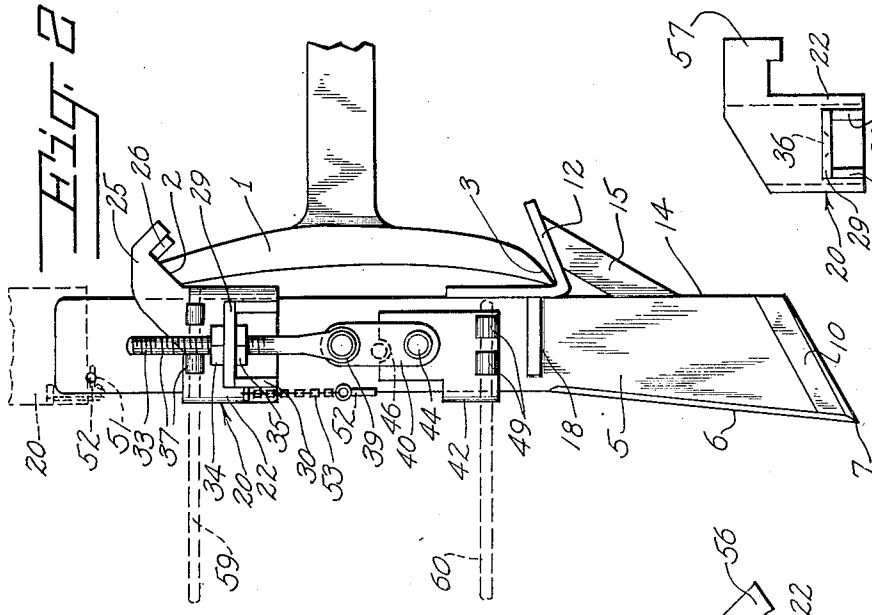


Fig. 9

Fig. 8

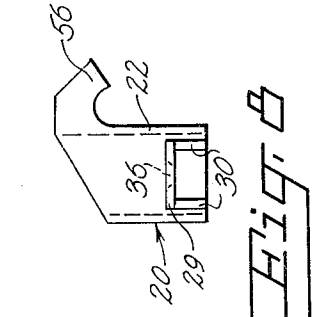


Fig. 1

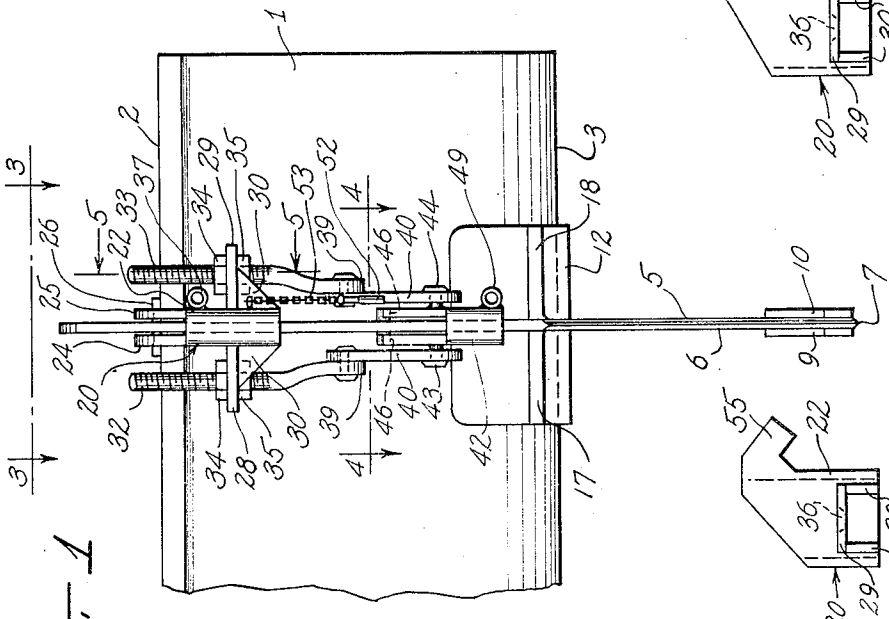


Fig. 7

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ADJUSTABLE RIPPER TOOTH FOR BULLDOZERS

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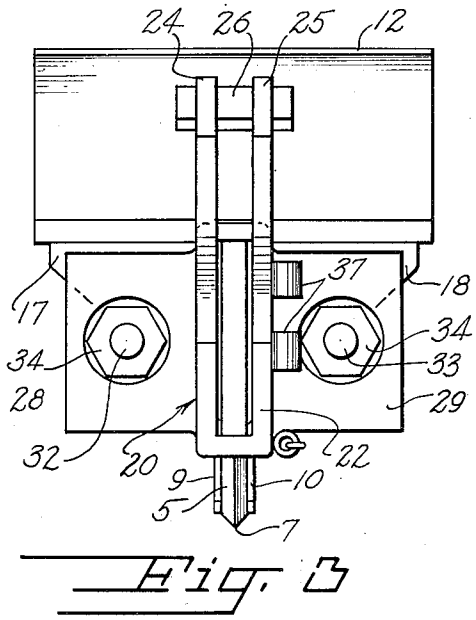


Fig. 3

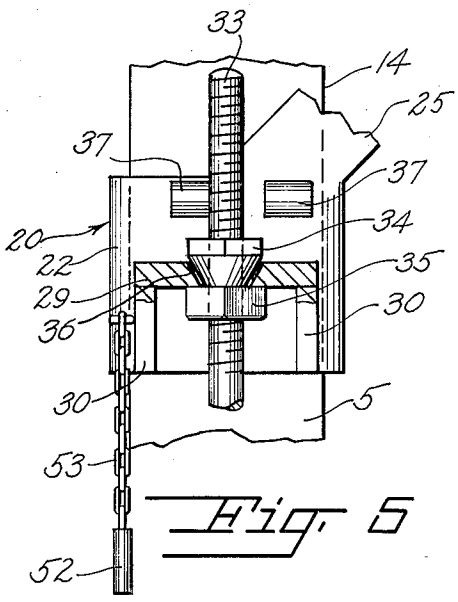


Fig. 5

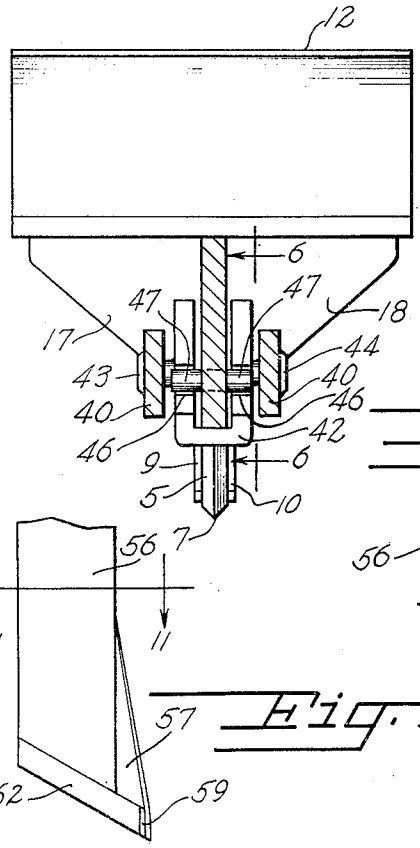


Fig. 4

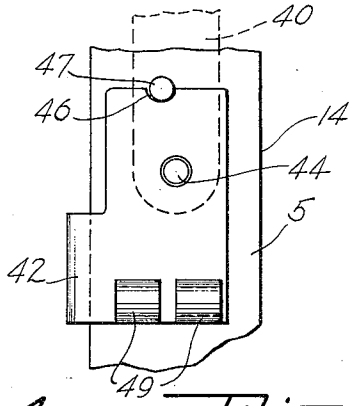


Fig. 6

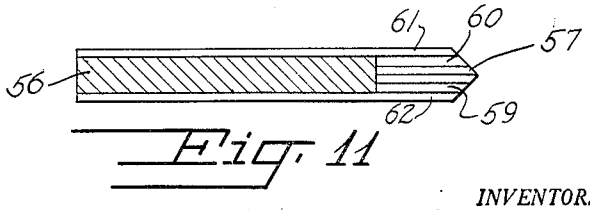


Fig. 11

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Patented Jan. 2, 1951 2,536,308

UNITED STATES PATENT OFFICE

2,536,308

ADJUSTABLE RIPPER TOOTH FOR BULLDOZERS

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Application October 21, 1947, Serial No. 781,026

3 Claims. (Cl. 262—8)

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This invention relates to a device for attachment to bulldozers, and more particularly to an adjustable ripper tooth to be secured to the blade or mold board of a bulldozer in order to adapt the same for use as a ripper.

The invention has for its chief object the provision of a ripper tooth structure capable of use on the blade of a bulldozer, whereby a single machine of this type may be used for several different grading operations.

Another object of the invention is to provide a ripper tooth capable of application to bulldozer mold boards of widely varying sizes, whereby one type of tooth structure may serve for the conversion of several types of bulldozers for use as rippers.

A further object resides in the provision of a ripper tooth structure having novel adjusting and clamping means enabling the same to be quickly and easily adjusted, and securely applied to different sizes of bulldozer blades.

A still further object is the provision of an adjustable ripper tooth of simple design and rugged structure capable of withstanding the hard wear and rough usage to which such an attachment is likely to be subjected.

To the accomplishment of the above and other objects, the invention comprises, briefly stated, a ripper tooth, a clamp member fixed on the tooth for engagement with the bottom edge of a bulldozer blade, a hook adjustably carried on the tooth for hooking over the top edge of the blade, means for adjusting the position of the hook on the tooth, and means for moving the hook toward the clamp member to clamp the tooth to the opposite edges of the blade.

The invention will best be understood from the following description, constituting a specification of the same, when taken in conjunction with the annexed drawings wherein:

Figure 1 is a front elevational view of a portion of a bulldozer blade, showing the adjustable ripper tooth of the invention applied to the same;

Figure 2 is a side elevational view of the invention, looking at one end of a bulldozer blade, and showing the adjustable ripper tooth clamped on the blade;

Figure 3 is a top plan view of the invention as illustrated in Figure 1;

Figure 4 is a cross-sectional view taken along the line 4—4 of Figure 1, looking in the direction indicated by the arrows;

Figure 5 is a vertical cross-sectional view taken along the line 5—5 of Figure 1, looking in the direction of the arrows and showing the structural details of the adjusting means provided for positioning the hook member on the ripper tooth;

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Figure 6 is a detail view showing the locking mechanism by which the ripper tooth is clamped to the bulldozer blade, and illustrating the position of the locking link in its locked condition;

Figures 7, 8 and 9 are side elevational views, showing different forms of hooks for use with the ripper tooth of the invention, whereby the same may be applied to bulldozer blades of different types;

Figure 10 is a fragmentary side elevational view of the lower portion of a modified form of ripper tooth;

Figure 11 is a cross-sectional view taken along the line 11—11 of Figure 10, looking in the direction indicated by the arrows.

Referring to the drawings in greater detail, 1 indicates the mold board or blade of a bulldozer, which in normal use is carried on the front of a tractor of conventional construction. Typical blades of this character are usually provided with substantially parallel upper and lower edges 2 and 3.

In order to adapt a bulldozer of this type to operate as a ripper, a number of ripper teeth are arranged in spaced-apart relation along the length of the blade 1, and secured to the same by the upper and lower edges 2 and 3. A ripper tooth for this purpose, constructed in accordance with the invention, is indicated at 5.

As best seen in Figures 1 and 2, the tooth 5 is of generally flat, blade-like configuration having a sharpened edge portion 6 near its lower end terminating in a reinforced point 7. The point 7 may conveniently be formed by reinforcing plates 9 and 10 secured to opposite faces of the blade 5, as by welding. As seen in Figure 2, the blade 5 may have its lower end somewhat widened, and sloping upwardly from toe to heel, to form a plow-like point, to better enable the same to penetrate the ground during the operation of the bulldozer as a ripper.

Above the pointed end of the blade 5, the same is provided with a socket member 12 secured to the rear vertical edge 14 of the tooth. The socket member, or angle member 12 is preferably in the form of a V having one arm welded to the edge 14, and the other end extending outwardly therefrom. A brace 15 may be provided for the member 12, extending from the outwardly extending arm of the same downwardly to meet the edge 14 of the tooth. Additional reinforcing means is also provided for the member 12, which may take

the form of plates 17 and 18 secured to the opposite faces of the tooth 5 and extending laterally therefrom for the full width of the member 12.

The socket member 12 secured as described above to the tooth 5 engages the lower edge 3 of the bulldozer blade and forms one part of a clamping means by which the ripper tooth is secured on the blade.

An upper clamp member 20 is slidably positioned over the upper end of the tooth 5, as best seen in Figures 1 and 2. This clamp member is in the form of a tubular portion 22 of generally rectangular configuration, having an opening of sufficient dimensions to fit easily on the upper portion of the tooth.

The member 20 has a pair of hooks 24 and 25 extending beyond the rear edge 14 of the tooth 5 for engagement over the upper edge 2 of the bulldozer blade. These hooks may be joined by a reinforcing bar 26 secured thereto by welding or other suitable means.

Laterally extending plates 28 and 29 are welded to the opposite sides of the member 22, and may be additionally secured thereto by gusset plates 30, as best seen in Figures 1 and 2. The plates 28 and 29 are provided with holes for the passage of screw-threaded rods 32 and 33, which are adjustably secured to the plates by nuts 34 and 35. As best seen in Figure 5, the holes in the plates 28 and 29, indicated at 36, are tapered, and the nuts 34 are provided with a corresponding taper seating in the holes.

Aligned loops or eyes 37 may be secured to one side of the member 20, for a purpose later to be made apparent.

The lower ends of the threaded rods 32 and 33 are formed with eyes 39 for pivotally connecting the rods to links 40, which in turn are pivotally connected to the opposite sides of a supporting member 42 at the points 43 and 44.

The supporting member 42 is of generally U shape in cross-section with the arms of the U extending on each side of the blade 5. At the upper end of the member 42 a notch 46 is provided in each side of the same, to engage a pin 47 secured to the blade 5 and extending from each side of the same. A pair of eyes 49 extend from one side of the supporting member 42 for a purpose later to be made apparent.

In the supported condition of the member 42, the pivotal points 43 and 44, where the member is connected to the link 40, lie slightly rearwardly of the pin 47, as will be apparent from an inspection of Figures 2 and 6 of the drawings. This arrangement is for the purpose of preventing accidental releasing of the clamping members, so that the tooth cannot slip off the bulldozer blade while the same is in use.

Near the upper end of the blade 5 of the tooth, a small hole 51 is provided to receive a pin 52 secured by a chain 53 attached to the member 20. The member 20 may be placed over the upper end of the tooth 5, before the tooth is attached to the bulldozer blade, and by inserting the pin 52 in the hole 51 in the tooth, the member 20 is prevented from sliding down the tooth until the same has been placed in position against the bulldozer blade. In Figure 2, the member is shown in the position just described, in dotted lines.

The member 20 may be provided with hooks of somewhat different configurations for use with different types of bulldozer blades. In Figure 7, the member 20 is shown provided with

hooks 55 having inverted V-shaped portions for engagement with the top edge of a bulldozer blade, while in Figure 8, the hooks 56 have rounded portions to be engaged with the top edge of a rounded blade. Similarly, the hooks 57 of the member 20, as seen in Figure 9, have portions of a shape suitable for engagement with the edge of a blade which is squared.

In attaching the ripper tooth structure described above to a bulldozer blade, the member 20 is placed over the upper end of the tooth, resting upon the pin 52 which has been placed in the hole 51. The supporting member 42 is swung outwardly to disengage the notches 46 from the pin 47, and the tooth is placed in engagement with the bulldozer blade with the edge 3 of the blade seating in the member 12. In this condition of the device, the member 20 is lowered by removing the pin 52 until the hooks 24 and 25 engage the upper edge of the blade. During the lowering of the member 20, the screw-threaded rods 32 and 33 are inserted through the holes in the plates 28 and 29, and the nuts 34 and 35 are adjusted in position for proper clamping of the blade between the member 12 and the hooks 24 and 25.

By now bringing the notches 46 in the supporting member 42 into engagement with the pin 47, and forcing the locking member 42 downwardly and inwardly against the tooth, the pivot points 44 are brought to the position indicated in Figures 2 and 6, securely locking the tooth in position on the bulldozer blade.

In adjusting the member 20 in position on the tooth, the rod indicated at 59 in dotted lines in Figure 2 may be inserted through the eyes 37 to form a handle, and in a similar manner a rod 60 may be inserted through the eyes 49 of the supporting member 42 to swing the same inwardly or outwardly in locking or releasing the tooth.

Due to the tapered fit between the holes in the plates 28 and 29, and the nuts 34, the distance between the supporting member 42 and the member 20 can be very closely adjusted to provide a tight clamping engagement of the tooth on the blade. Furthermore, the width of the member 12 in engagement with the bottom edge 3 of the bulldozer blade, and the provision of the two hooks 24 and 25, one on each side of the tooth, forms a clamping structure by which a very firm connection between the tooth and the blade can be obtained, thus assuring that the tooth will be securely attached to the blade under all conditions of operation of the machine as a ripper.

In Figures 10 and 11 of the drawings, a somewhat modified built-up form of ripper tooth construction is illustrated. This structure comprises a straight steel bar 56 of uniform cross-section throughout its length to the lower end portion of which is secured a sharpened edge piece 57 preferably of elongated triangular shape. The edge piece 57 may be of somewhat less thickness than the bar 56, and filler pieces 59 and 60 may be positioned at either side of the edge piece to increase the rigidity of the same.

Reinforcing plates 61 and 62, similar to those previously described in connection with the ripper tooth 5, may be provided at opposite sides of the bar 56 extending beyond the front edge of the same to engage the filler pieces 59 and 60. This modified form of ripper tooth structure makes it possible to use stock materials in building the teeth, thus avoiding the expense of procuring

specially-shaped pieces suitable for this purpose. The edge piece 57 may, of course, be of suitably hardened material adapted to retain its edge under conditions of heavy wear.

It will thus be seen that the invention as described above provides a ripper tooth of simple design and rugged construction, having improved means by which the same may be easily and quickly attached to the mold boards of various types of bulldozers to convert the same for use in a wide variety of operations which would otherwise be beyond the scope of machines of this character.

While the invention has been disclosed by reference to a particular embodiment of the same, it will, of course, be understood that numerous changes can be made in the proportions and arrangement of the various parts without departing from the spirit of the invention or the scope of the appended claims.

Having now clearly shown and described the invention, what is claimed as new and desired to secure by Letters Patent is:

1. In a device for attachment to the mold board of a bulldozer, an elongated ripper tooth disposed vertically adjacent said mold board, an angle member fixed to the lower end of said tooth receiving the lower edge of said mold board, slidable means on said tooth for engagement with the upper edge of said mold board, means carried by said slidable means intermediate the latter and said angle member for supporting said tooth, said last mentioned means being mounted for pivotal movement into and out of supporting position with respect to said tooth, and a second means carried by said slidable means for adjusting the distance between said angle member and said slidable means.

2. In a device for attachment to the mold board of a bulldozer, an elongated ripper tooth disposed vertically adjacent said mold board, an angle member fixed to the lower end of said tooth receiving the lower edge of said mold board, slidable means on said tooth for engagement with the upper edge of said mold board, said tooth being provided with a pin extending transversely therethrough intermediate said slidable means and said angle member, means carried by said slidable means intermediate to the latter and said angle member for supporting said tooth, said last mentioned means comprising a U-shaped member mounted for vertical pivotal movement into and out of supporting position with respect to said tooth, said U-shaped member having notched arms adapted to embrace said tooth and engage said pin when in a supporting position, and a second means carried by said slidable means for adjusting the distance between said angle member and said slidable means.

3. In a device for attachment to the mold board of a bulldozer, an elongated ripper tooth disposed vertically adjacent said mold board, an angle member fixed to the lower end of said tooth receiving the lower edge of said mold board, slidable means on said tooth for engagement with the upper edge of said mold board, said tooth being provided with a pin extending transversely therethrough intermediate said slidable means and said angle member, means carried by said slidable means intermediate to the latter and said angle member for supporting said tooth, said last mentioned means comprising a U-shaped member mounted for vertical pivotal movement into and out of supporting position with respect to said tooth, said U-shaped member having notched arms adapted to embrace said tooth and engage said pin when in a supporting position, and a second means carried by said slidable means for adjusting the distance between said angle member and said slidable means, said second means including a pair of vertical threaded rods disposed on opposite sides of said tooth and operatively connecting said slidable means with said U-shaped member.

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