June 20, 1967 H. H. WASHBOND ET AL 3,326,302

RIPPER TOOTH

Filed April 6, 1965

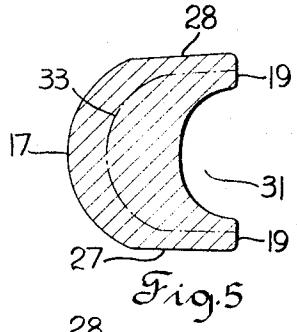

Fig. 5

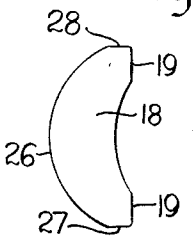

Fig. 4

Fig. 1

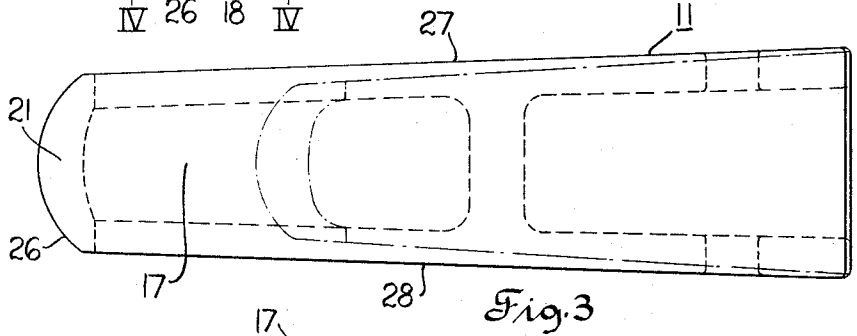

Fig. 3

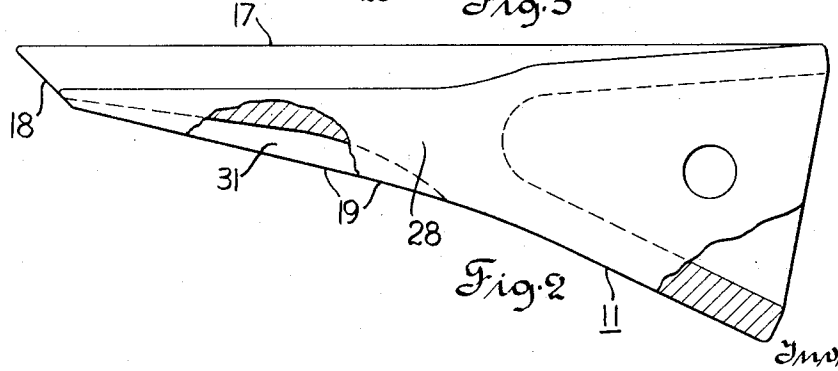

Fig. 2

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RIPPER TOOTH

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This invention relates to a tooth for earthworking tools such as rippers.

The utility of a ripper tooth is generally determined by the ease of penetration and the wear life without sharpening or reversing. One measure of usefulness of a tooth is the ratio of the throwaway material to the original material. Heretofore many different types of digger teeth have been proposed and used in various earthworking operations such as ripping. A ripper tooth, ideally, should have good penetrating characteristics, long life (without reversing or resharpening) and be strong enough to withstand the impact loads to which subjected when working in rock and the like.

It is commonly known that ripper teeth are subjected to extreme abrasive and shock conditions and can only be supported by a relatively small area, otherwise, the material thrown away becomes excessive. The wear life can be obtained through mass of material and hardness, but under such design, penetration is very poor. Penetration can be accomplished through design of a slender, pointed shape, but at the expense of wear life and adequate strength.

It is an object of this invention to provide an improved replacement ripper tooth, having the desired characteristics hereinbefore outlined, and which is economical to manufacture.

More particularly, it is an object of this invention to provide a self-sharpening ripper tooth having good earth penetrating characteristics.

It is a further object of this invention to provide a ripper tooth as indicated in the previous object which has an elongated nose portion which wears away during use without the tooth losing its necessary strength and good penetrating characteristics.

These and other objects and advantages of this invention will be apparent when the following description is read in conjunction with the drawings in which:

FIG. 1 is a side view of a ripper tooth attached to an earthworking tool and engaged in a normal earthworking operation;

FIG. 2 is a side view of the ripper tooth detached from the tool and shown partially in section;

FIG. 3 is a top view of the tooth illustrated in FIG. 2;

FIG. 4 is a bottom view taken along line IV—IV in FIG. 1; and

FIG. 5 is a section view taken along line V—V in FIG. 1.

Referring to FIG. 1, the forged ripper tooth **11** has a tapered socket **16** at its upper rear engaging a tongue **14** at the end of a ripper shank **12**. The tooth **11** is secured to shank **12** by a roll pin **13** extending through sidewalls of the tooth and through tongue **14** of the shank **12**. In the ripping position of the tooth, a transversely crowned leading face **17** extends upwardly and rearwardly from a horizontal bottom face **18** of the tooth at approximately 45 degrees. This angle is satisfactory for ripping most materials. The trailing face **19** also extends upwardly and rearwardly from the bottom face **18** in diverging relation to the convex leading face **17**.

Referring also to the other figures of the drawings, the transversely arcuate leading face **17** and the trailing face **19** define a long slender nose **21** having sufficient transverse width to produce a good ripping action and just

sufficient thickness in the direction of travel indicated by arrow **22** to provide adequate strength.

The crowned leading face **17** merges at its forward lower end with the bottom face **18** in a transversely convex penetrating edge **26**. This shape leading edge provides good penetrating characteristics. The transversely spaced and vertically disposed sides **27**, **28** of the tooth extend from the penetrating edge **26** rearwardly in slightly diverging relation to one another. The trailing face **19** includes a transversely arcuate indentation or groove **31** which approximates the curvature of the leading face **17**. The convex leading and concave trailing faces **17**, **19** are so designed to intersect with the bottom face **18** to provide a substantially uniform front to rear dimension between faces **17**, **19** over a major portion of the transverse width of the tooth. This insures even wearing of the bottom face **18**.

During operation the abrasive action of the material being ripped by the tooth will wear the leading face **17**, sides **27**, **28** and bottom face **18**. As wear occurs the nose portion **21** of the tooth will be gradually shortened. The abrasive action of the material being ripped across the bottom face **18** will cause the tooth to wear away in a self-sharpening manner, thus when the tooth has worn to the condition illustrated by the dot-dash lines **33** the tooth will continue to have a good penetrating point and the bottom surface thereof will still be approximately parallel to the direction of travel **22** of the tooth. Additionally the front to rear dimension of the bottom face of the tooth in this condition of wear will still be approximately uniform across the major portion of the width of the tooth. This even wearing of the bottom surface or face **18** of the tooth insures a good, strong penetration point throughout the useful life of the tooth. Additionally it will be noted that the leading edge **17** continues to have its transversely crowned configuration as it wears away. As the material being ripped moves upwardly and toward the sides of the tooth the abrasive action thereof tends to evenly wear the leading face. It will be noted that as the tooth wears on its leading and bottom faces and sides, the tooth is shortened to such an extent that the strength of the remaining tooth is still sufficient to adequately perform the ripping operations without breakage.

The overall design of the tooth lends itself to being forged and a forged tooth is desired because of the increased strength of forgings over castings, for instance. Thus, our tooth is designed to be substantially wedge shaped yet elongated to provide a slender longitudinally extending nose **21** with a minimum mass for strength and desired ripping characteristics and a maximum of wear away nose to provide long life. During the long useful life of the tooth, it maintains its good penetrating characteristics, is self-sharpening and need not be reversed on its mounting tongue **14**.

Although only one embodiment of this invention has been illustrated, other tooth designs utilizing our inventive concept will no doubt be apparent to those familiar with the art to which our invention pertains.

The embodiments of the invention for which an exclusive property or privilege is claimed are defined as follows:

1. A self-sharpening, long life earthworking tooth comprising a substantially wedge shaped and longitudinally elongated body having

a pair of transversely spaced sides,

a transversely crowned leading face extending between said sides,

a flat bottom face,

said leading and bottom faces converging an acute angle into a transversely convex penetrating edge,

said bottom face lying substantially in a horizontal plane and said leading face extending upwardly and rear-

wardly therefrom when said tooth is in its normal earthworking position, and

a transversely concave trailing face spaced rearwardly of and in diverging relation to said leading face,

said trailing face extending upwardly and rearwardly from said bottom face when said tooth is in said normal earthworking position and the front to rear dimension of said bottom face being substantially uniform over a major portion of its transverse width.

2. The structure set forth in claim 1 wherein the front to rear dimension of said bottom face is less than its transverse width.

3. The structure set forth in claim 2 wherein the front to rear dimension of said bottom face continues to be approximately uniform over a major portion of its transverse width as the tooth wears away in earthworking use.

4. The structure set forth in claim 3 wherein said sides taper slightly in converging relation to one another toward said penetrating edge.

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