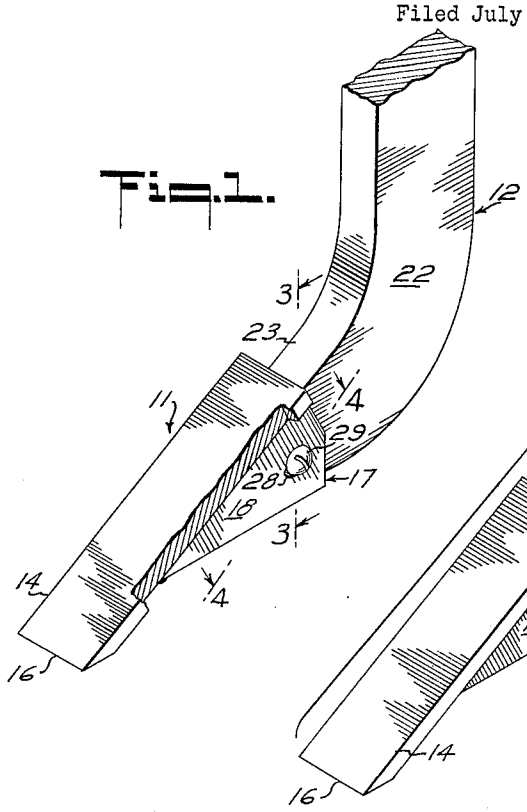
Dec. 19, 1961 R. R. HILL 3,013,620

TOOTH LOCKING MEANS

Filed July 13, 1959

Fig. 1.



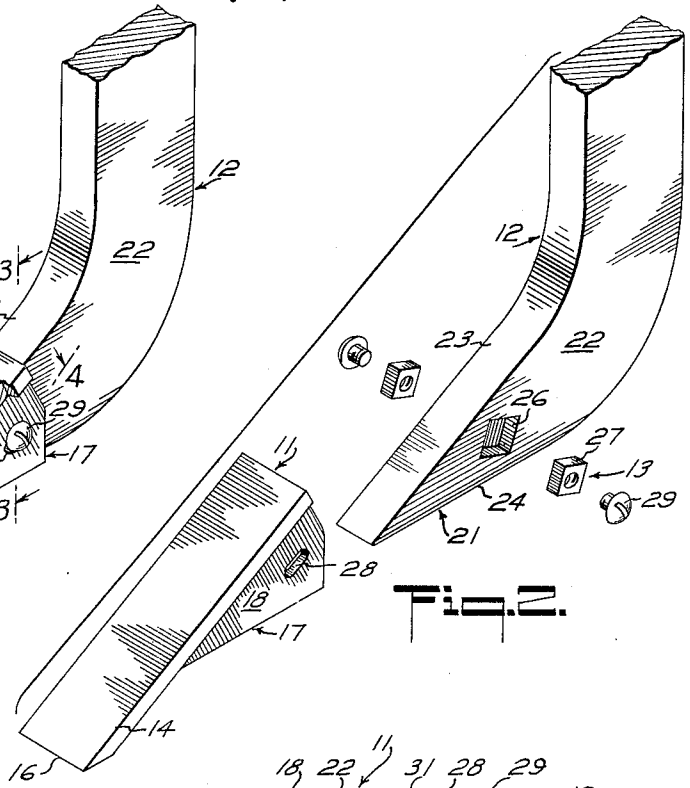


Fig. 2.

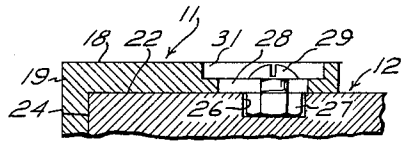


Fig. 5.

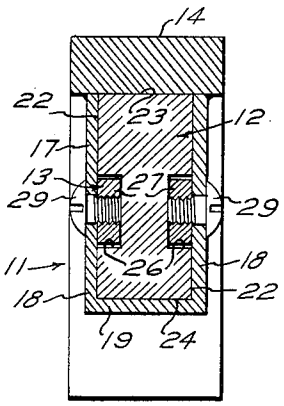


Fig. 3.

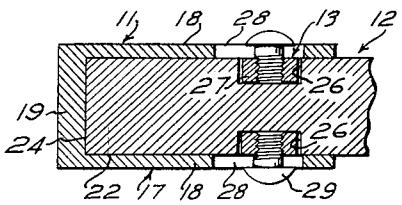


Fig. 4.

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TOOTH LOCKING MEANS

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The present invention relates to retaining means for ripper points or teeth and the like, and more particularly to improved means for detachably locking an earth digging point or tooth on a shank or equivalent tool support base of agricultural implements, excavating machine, and the like.

Inasmuch as earth digging teeth, such as upper points and the like, become dull after extended periods of earth engaging operation and are susceptible to breakage, the individual teeth are of necessity arranged to be readily replaceable. Conventionally, a variety of detachable retaining means have been employed to secure each tooth to a shank or base of the earth working implement whereby the teeth may be individually removed for replacement. Known tooth retaining means are generally disadvantageous, however, for a variety of reasons. Many of the known retaining means render the teeth exceedingly difficult and cumbersome to remove. Others require special tools to facilitate attachment and removal of the tooth from the shank. Still other conventional retaining means have portions formed integrally with the tooth and projecting by substantial amounts from the exterior of the tooth whereat the retaining means portions are readily susceptible to damage which in many instances renders the entire tooth irreparable.

It is therefore an object of the present invention to provide improved lock means for a ripping tooth or the like whereby the tooth may be firmly and tightly secured to a shank or base while being readily detachable therefrom for replacement.

It is another object of the invention to provide lock means of the character described which facilitates attachment and removal of the tooth without necessitating special tools.

Still another object of this invention is the provision of lock means for detachably securing a digging tooth to a shank wherein the lock means is entirely hidden or enclosed.

A further object of the present invention is the provision of lock means of the character described which is readily replaceable upon being damaged.

The invention possesses other objects and features of advantage, some of which, with the foregoing, will be set forth in the following description of the preferred form of the invention which is illustrated in the drawing accompanying and forming part of the specification. It is to be understood, however, that variations in the showing made by the said drawing and description may be adopted within the scope of the invention as set forth in the claim.

FIGURE 1 is a perspective view of a ripping tooth as secured to a shank by lock means in accordance with the present invention.

FIGURE 2 is a view similar to FIGURE 1 but illustrating the tooth, shank, and a preferred embodiment of the lock means in disassembled relation.

FIGURE 3 is a sectional view taken along line 3—3 of FIGURE 1.

FIGURE 4 is a sectional view taken along line 4—4 of FIGURE 1.

FIGURE 5 is fragmentary view similar to FIGURE 4 but illustrating a modification of the lock means.

Referring now to the drawings, FIGURE 1 in particular, there is seen to be provided a ripping tooth **11** as

detachably secured to a shank **12** or equivalent base of an earth working implement by lock means **13** in accordance with the present invention.

The tooth **11** is of generally conventional configuration including a flat rectangular body **14** inclined to the horizontal and beveled at its under surface in conveying relation to its upper surface to form a sharpened earth engaging point **16**. A housing **17** or box depends from the under surface of body **14** and has spaced substantially wedge shaped side walls **18** extending longitudinally of the body and a bottom wall **19** (see FIGURE 3) extending transversely between and connecting the side walls **18**. The housing **17** extends from substantially the rear end of the body to a longitudinally intermediate position thereof. The body **14** hence slopes downwardly and forwardly at an angle relative to the bottom wall **19** of the housing **17**.

The shank **12** is conventionally provided with a wedge shaped tip **21** (see FIGURE 2) which the housing **17** of tooth **11** is adapted to conformably engage. The particular shank **12** depicted in the drawing is substantially vertical with an arcuately forwardly projecting portion forming the wedge-shaped tip **21**. Other shank configurations with wedge shaped tips may, however, be as well employed. The tip **21** is rectangular in section and has flat parallel sides **22** and flat upper and lower surfaces **23** and **24** that converge forwardly to form the wedge configuration. The housing **17** is proportioned to closely engage about the tip **21** in order to hold or secure the tooth **11** in place thereon. The housing receives substantially the entire tip **21** and when engaged the side walls **18** of the housing lie closely against the sides **22** of the tip. The bottom wall **19** of the housing similarly lies flat against the lower surface **24** of the tip while the tooth body **14** rests flat against the upper surface **23** of the tip. The tooth **11** is hence conventionally placed upon shank **12** by wedging the housing **17** upon the tip **21**.

In order that the tooth **11** be retained firm and tight upon the shank **12** under all conditions of operation, detachable lock means in addition to the wedge fit between the tooth and shank are conventionally employed. As previously mentioned, the lock means utilized heretofore have been variously disadvantageous in that they are readily susceptible to breakage, difficult or cumbersome to operate, require special tools to facilitate the locking and releasing actions, and the like. The lock means **13** in accordance with the present invention overcomes these difficulties as well as possesses other advantages. More particularly, to provide the lock means **13**, at least one of the sides **22** of the shank tip **21** is recessed at a substantially central position as shown generally at **26** to readily accomodate a nut **27**. The recesses are best formed during hot forming of the shank **12** although such recesses may alternatively be provided by any other of many well known metal working methods. The nuts **27** are preferably standard nuts of any desired configuration, for example square as depicted in FIGURES 2–4, hexagonal as depicted in FIGURE 5, or the like. The conformed recesses **26** are of a depth substantially equal to the thickness of the nuts **27**. Accordingly when the nuts are placed in the recesses, the faces of the nuts are flush with the tip sides **22**. The housing **17** of the tooth **11** may hence be readily slid over the recessed nuts **27** as the tooth is placed upon the shank. When the tooth and shank are assembled, the inner surfaces of the housing side walls **18** are hence in abutment with the faces of the nuts **27** and same are entirely enclosed or hidden by the housing **17** as best shown in FIGURES 3 and 4.

To complete the novel lock means **13** and facilitate firm and tight securance of the tooth **11** to the shank

12 as well as ready disassembly thereof, elongated holes 28 are provided through the sides 18 of tooth housing 17 to register with the recesses 26 in the tip 21 of shank 12 and nuts 27 disposed therein when the tooth is slid into operable position upon the shank. In addition, machine screws 29, preferably of a standard type and of a compatible size relative to the nuts 27, are inserted through the holes 28 and tightened into the nuts 27. The length of each screw 29 is best selected substantially equal to the sum of the depth of the corresponding recess 26 and thickness of the housing side 18. Upon tightening the screw into the nut, the end of the screw is hence substantially flush with the base of the recess.

The lock means 13 physically described hereinbefore facilitates ready retention of the tooth 11 upon the shank 12. The nuts 27 are first placed in the recesses 26 at the sides 22 of shank tip 21 and the tooth housing 17 slid over the shank tip into wedge fit relation therewith. By virtue of the elongated nature of the holes 28, registry of same with the nuts 27 is assured no matter what position the tooth housing 17 assumes in forming a wedge fit with the shank tip 21. The tooth is then tightly and firmly locked in position upon the shank by merely inserting the machine screws 29 through the holes 28 and screwing such screws into tight threadable engagement with the nuts 27. The tooth 11 may thus be rendered readily removable from the shank 12 by simply unscrewing the screws 29. It will be noted that only a standard screwdriver is hence required to facilitate securance of the tooth to the shank or removal therefrom with the releasable lock means 13 in accordance with the present invention. Moreover, the lock provided by the screws 29 engaging the nuts 27 residing in the recesses 26 is substantially entirely enclosed or hidden. Therefore, the lock is not readily susceptible to damage or breakage arising from direct engagement of same with the earth during the digging operation. In addition, should the lock means be damaged, as for example by stripping of the threads of the nuts 27 or screws 29, it is only necessary to replace these damaged elements of the lock means with inexpensive standard nuts and screws.

Although the lock means 13 is substantially entirely

enclosed in the embodiment hereinbefore described and depicted in FIGURES 1–4 of the drawing, only the heads of screws 29 being without the exterior surfaces of housing sides 18, it is sometimes desirable that the lock means be completely within the compass of the tooth housing 17. To facilitate the foregoing the elongated holes 28 through the sides of the housing may be modified to include a countersink 31 as depicted in FIGURE 5 for receiving the heads of machine screws 29. In such alternative embodiment, the length of the screws 29 is necessarily substantially equal the sum of the depth of the recesses 26 and the thickness of the sides 18 from the base of the countersink 31 to the interior surface thereof.

What is claimed is:

Lock means for detachably securing an earth digging tooth to a shank, said shank having a generally square nut receiving recess in each of the opposite sides thereof, said tooth having a point forming body and a depending housing including spaced side walls having their outer sides spaced inwardly of the side edges of the body, said walls engageable over said shank with holes extending through the walls in registry with said recesses in the shank, a nut disposed in each of said recesses and having a thickness substantially equal to the depth of the recess, and a screw inserted through each of said holes into tight threadable engagement with the corresponding nut and having a head with its inner face engaging the outer edge of the associated housing wall and with its outer face substantially flush with the side edge of the body.

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