June 6, 1967 G. A. PETERSEN 3,323,235

RESILIENT RETAINER FOR EXCAVATING TOOTH

Filed Nov. 23, 1964 6 Sheets-Sheet 1

FIG_5

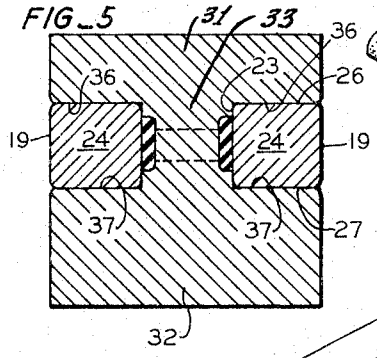


FIG_1

FIG_6

FIG_2

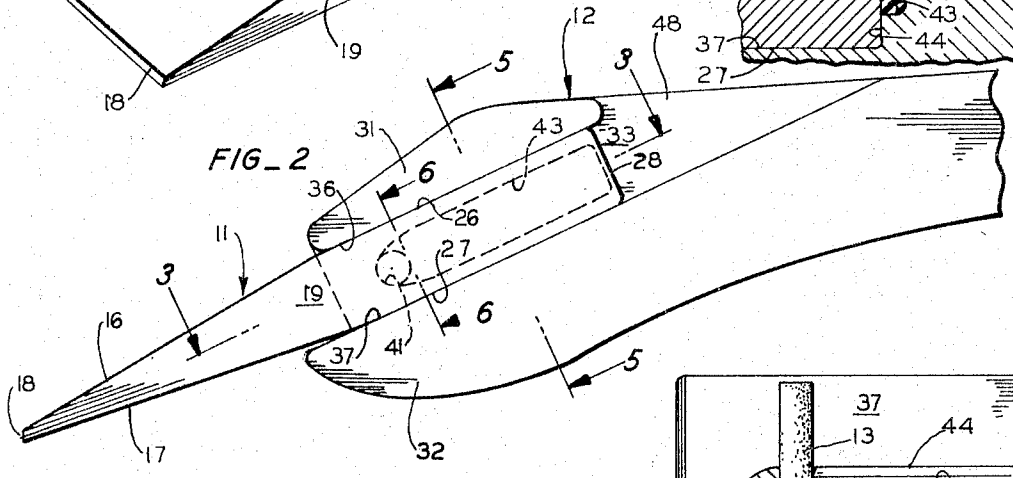


FIG_3

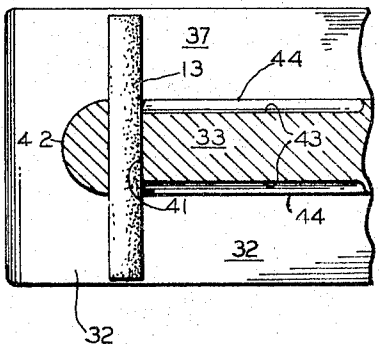
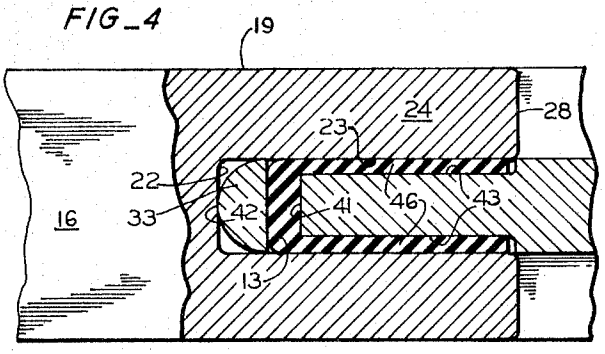


FIG_4



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RESILIENT RETAINER FOR EXCAVATING TOOTH

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FIG_7

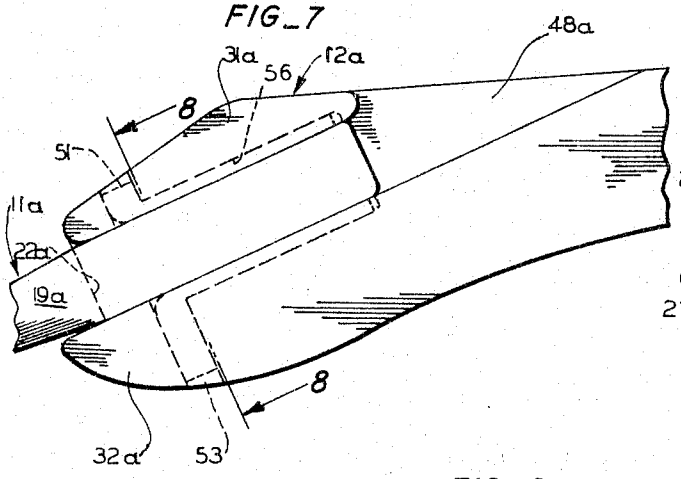


FIG_8

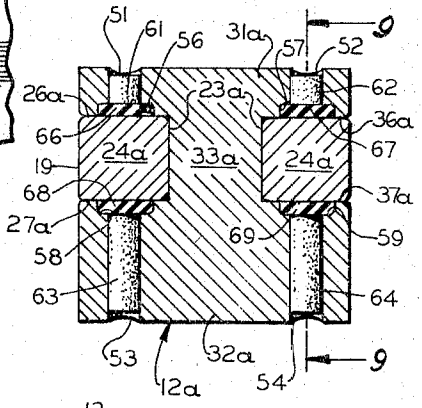


FIG_9

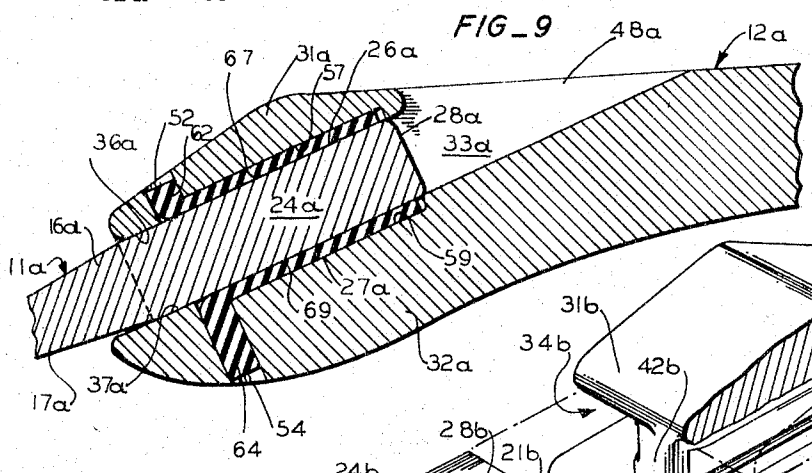
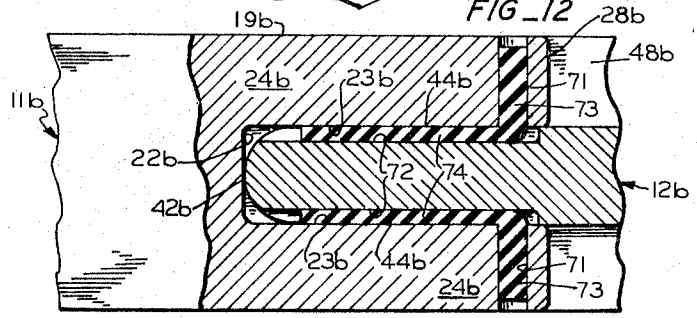


FIG_10

FIG_11

FIG_12



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RESILIENT RETAINER FOR EXCAVATING TOOTH

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FIG_15

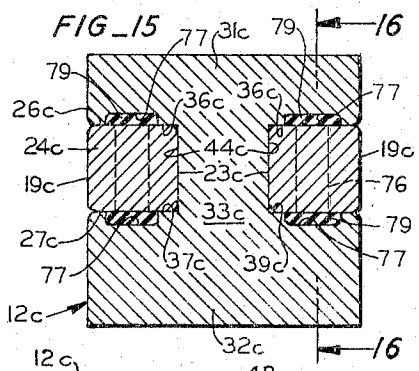


FIG_13

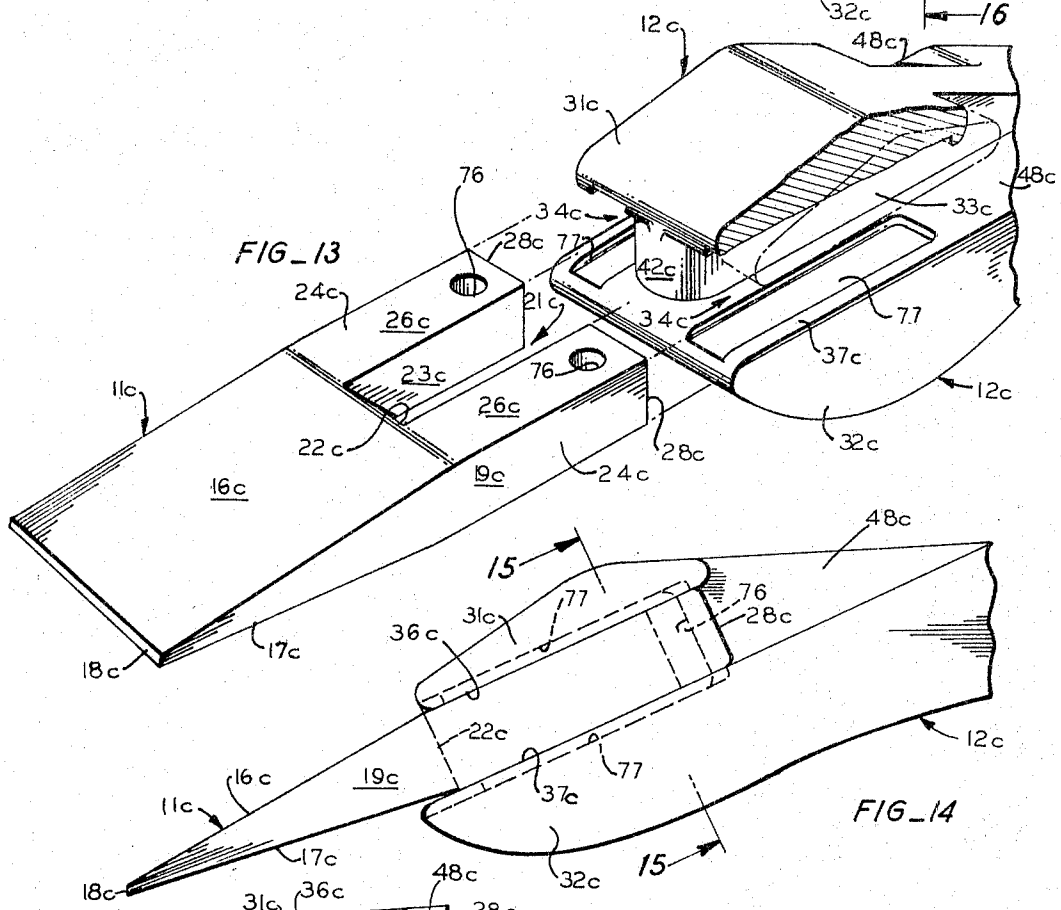
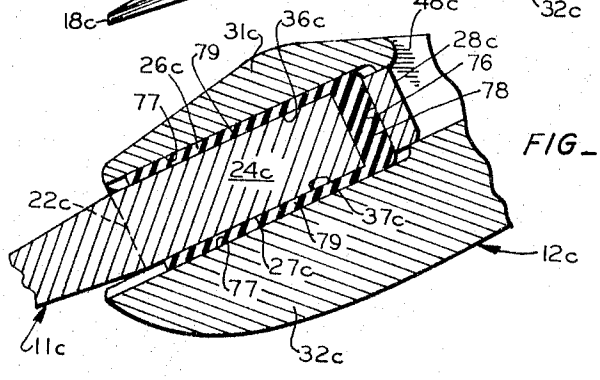


FIG_14

FIG_16



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RESILIENT RETAINER FOR EXCAVATING TOOTH

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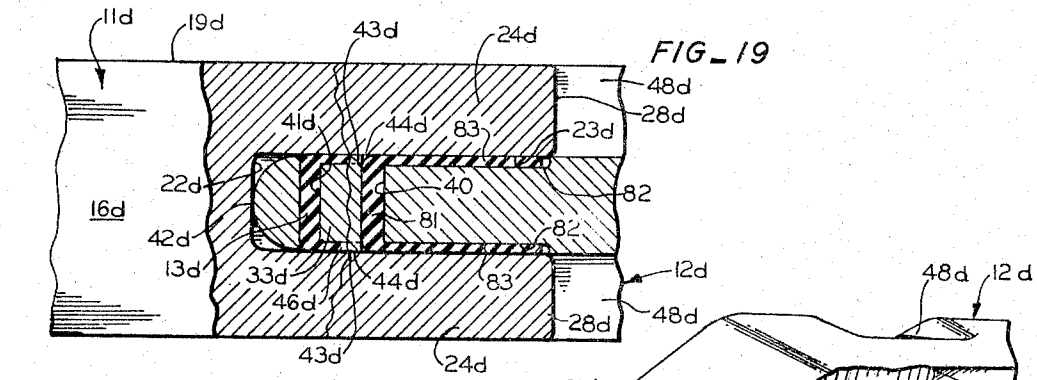

FIG_19

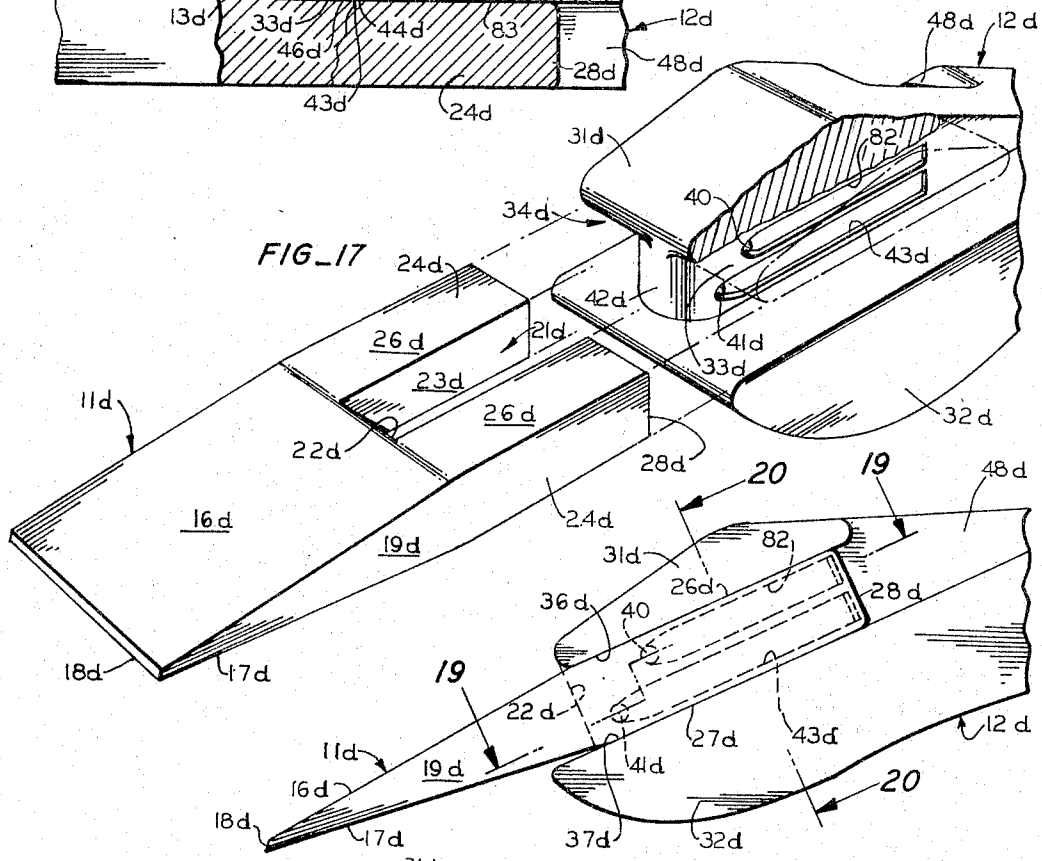

FIG_17

FIG_18

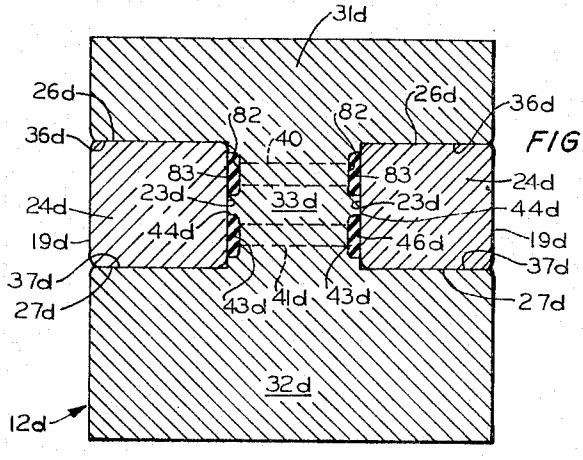

FIG_20

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RESILIENT RETAINER FOR EXCAVATING TOOTH

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FIG_21

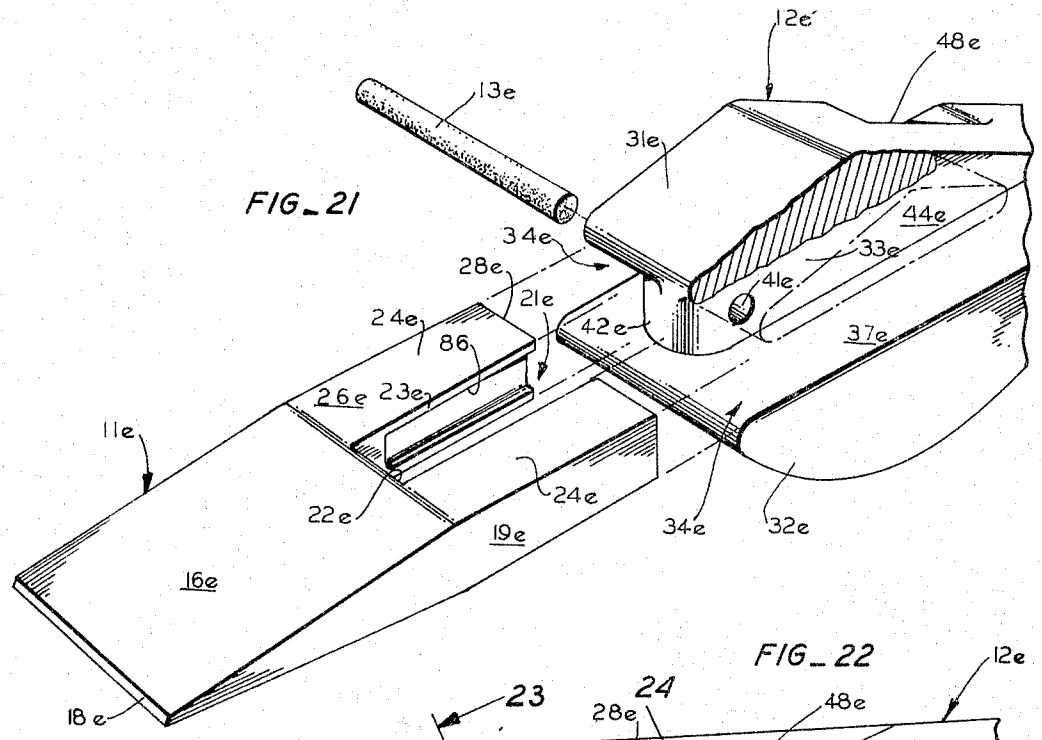


FIG_22

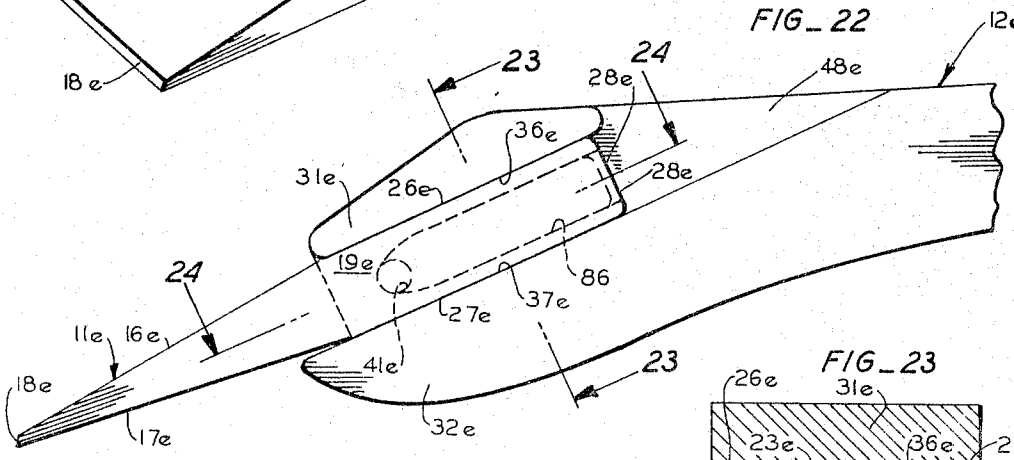


FIG_23

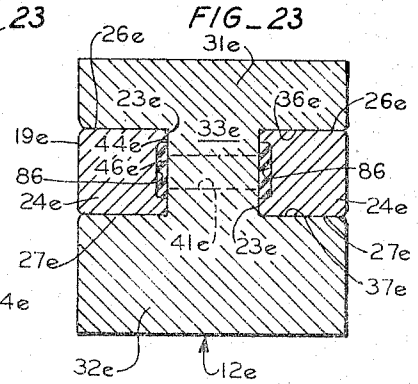
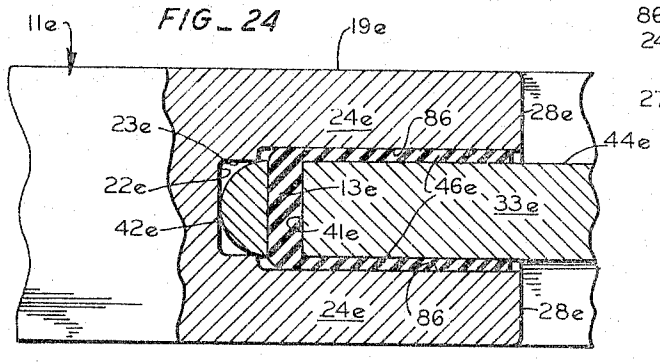


FIG_24



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RESILIENT RETAINER FOR EXCAVATING TOOTH

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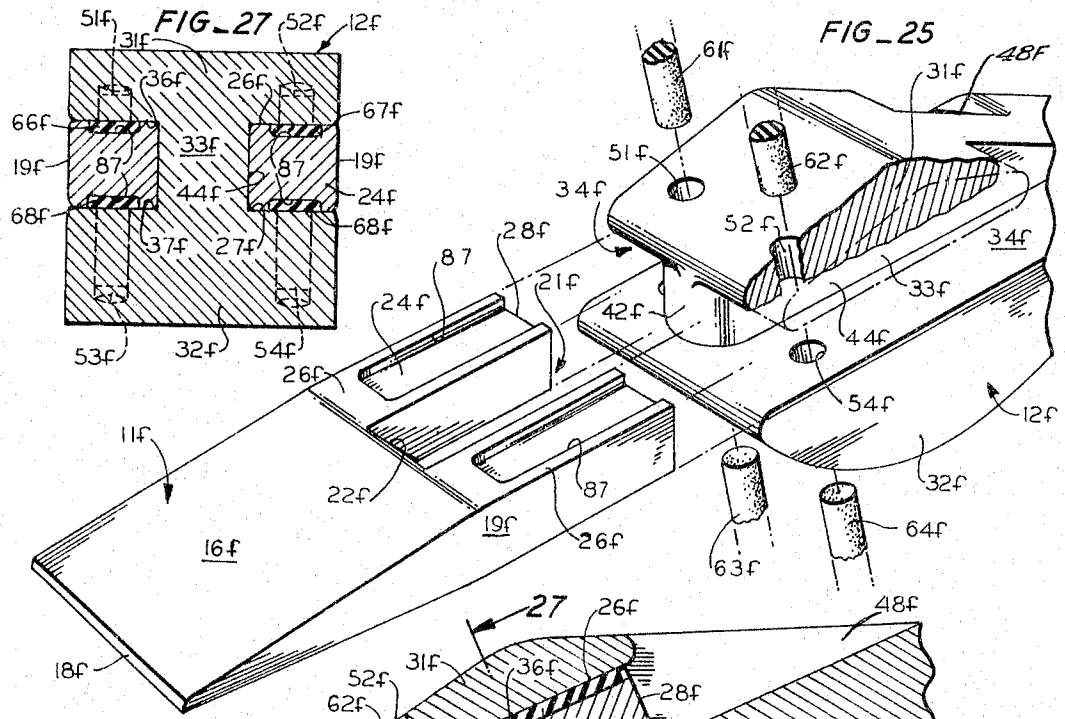

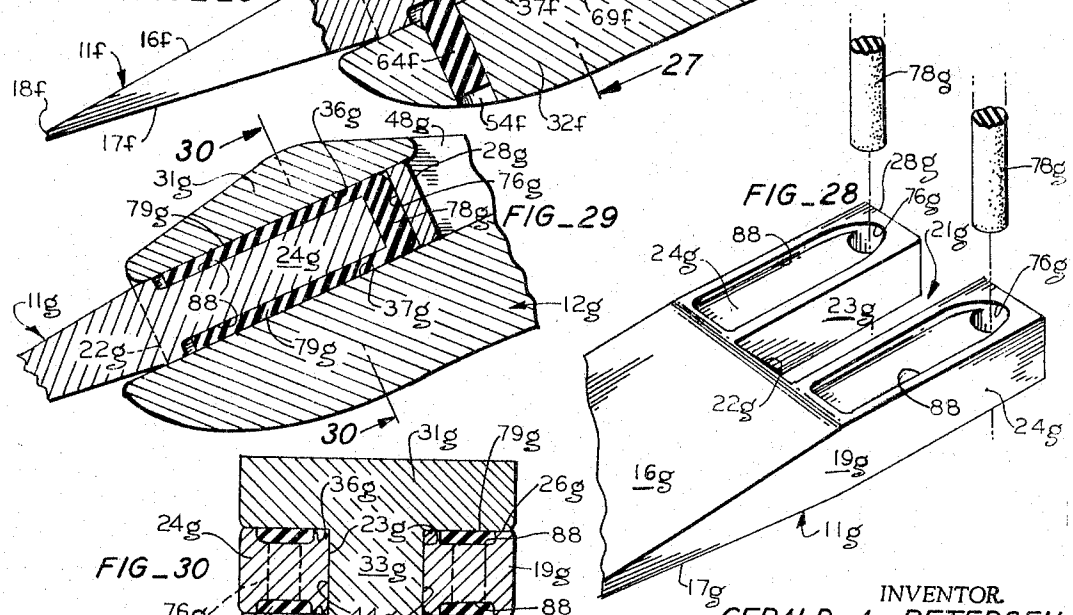

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United States Patent Office 3,323,235 Patented June 6, 1967

3,323,235

RESILIENT RETAINER FOR EXCAVATING TOOTH

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Filed Nov. 23, 1964, Ser. No. 413,180
23 Claims. (Cl. 37—142)

This invention relates to a new and improved resilient retainer for excavating tooth. Various earth-digging machines such as augers, trenching machines, and the like, use replaceable teeth which are held in place by a tooth holder formed integrally or attached to the equipment. As the teeth are worn they may be reversed to increase their life, they may be removed for the purpose of sharpening, or they may be replaced when worn. Therefore, it is necessary to have a means which will hold the tooth on its holder under considerable stress and with security, and yet will permit intentional separation of the tooth and holder. The present invention provides such means.

A particular advantage of the present invention is the facility with which the tooth may be installed and removed and the fact that no special tools are required for such purpose.

A still further advantage of the invention is the fact that the means which secures the tooth on its holder is resilient and hence accommodates minor variations in the construction of the tooth and the holder, thereby making close tolerances unnecessary and further accommodating wear of the parts with the passage of time.

A still further feature of the invention is the provision of cooperating means on the tooth and its holder to prevent the tooth from being displaced from its proper position when the tooth is subjected to severe stress such as striking a hard object at one corner of the tooth.

In the form of the invention hereinafter described in detail, the tooth holder is formed with a pair of recesses extending rearwardly from the forward end so that the shape of the holder, as viewed in front elevation, is substantially that of an H turned on its side. A web extends between the top and bottom portions of the holder. The tooth which is used with such a holder has a tapered distal portion which performs the digging function and a bifurcated proximal portion composed of two prongs separated from each other by a substantially rectangular slot which extends forwardly from the proximal end of the tooth. The web of the holder fits into the slot with relatively close tolerances. In a preferred form of the invention a hole is formed extending through the web and rearwardly of the hole a pair of longitudinal grooves is formed. A resilient insert is inserted through the hole extending outwardly of either side of the web into the recesses between the top and bottom portions of the holder. When the prongs of the tooth are inserted in the recesses the resilient member is jammed between the web and the side edges of the slot of the tooth. The grooves rearwardly of the hole receive the ends of the resilient insert which are bent backwardly by the prongs of the tooth and hence the insert is jammed between the prongs and the bottom of said grooves.

In the form of the invention hereinafter described in detail, the depth of each groove is substantially less than the initial diameter of the insert or the hole in which the insert is installed. Additionally, the width of the groove (i.e. in the direction extending between the top and bottom portions of the holder) is greater than the initial diameter of the insert or of the hole in the web. Accordingly, the resilient insert is flattened and spread in a vertical sense and this increases the area of contact of the flattened resilient insert with the side walls of the slot of the tooth. Since the resilient insert serves as a frictional means for restraining unintentional displacement of the tooth from the holder, increasing the area of contact materially increases the effectiveness of the holding action and thus the present invention considerably improves the efficiency of the retention means.

A particular advantage of the use of a wide, shallow groove and consequent flattening of the resilient insert is the fact that this construction permits the use of the principle of a resilient retainer to hold in place teeth which are considerably larger, heavier and subjected to greater strain than have heretofore been retained by the resilient retainer principle. Thus the versatility of the retaining means is considerably augmented.

Accordingly, a principal feature of the present invention is the fact that bolts, metal keys and similar fastening means to secure the tooth to the shank are eliminated, thereby eliminating much of the difficulty heretofore occasioned in securing the teeth to holders. The use of a resilient insert to frictionally bond the tooth to the holder inhibits abrasive action which might eventually wear the mating parts.

A further feature of the invention is the provision of a modified holding means wherein the resilient insert is located in a hole which extends through the top and/or bottom portion of the holder rather than through the web. Such an insert may be installed on one or both sides of the holder to engage one or both prongs on one or both surfaces of the prongs.

Still another feature of the invention is the provision of a modified tooth wherein the resilient insert is installed in one or more holes extending transversely through the prongs of the tooth rather than through a hole in the holder. It will be understood that in some locations and under some conditions installation of the resilient insert through its hole requires considerable manual dexterity or operating conditions may interfere with the installation. Since the tooth is usually more readily portable than the holder and also is considerably more accessible, being able to install the resilient insert through a hole in the tooth simplifies the operation.

A still further modified tooth has the holes located extending from top to bottom of the prongs rather than transversely through the prongs. Again, such a location in some instances simplifies and expedites the assembly of the insert in its holder and the eventual insertion of the tooth in the holder.

Still another feature of the invention hereinafter described in detail is the provision of a plurality of resilient inserts which cooperate to hold the tooth in its holder. By using a plurality of inserts, the surface area which frictionally engages the two mating parts is considerably increased.

In connection with the modification described in the preceding paragraph, another feature of the invention is the relative location of the inserts, one located spaced forwardly of the other in the direction of the insertion of the tooth in its holder. Thus at the commencement of the insertion operation the tooth encounters only one of the plurality of inserts, but as the insertion is continued an additional one or more inserts are encountered. The gradual increase in frictional resistance simplifies insertion of the tooth and yet has the advantage of more securely locating the tooth in its holder.

Other objects of the present invention will become apparent upon reading the following specification and referring to the accompanying drawings in which similar characters of reference represent corresponding parts in each of the several views.

In the drawings:

FIG. 1 is an exploded perspective view of a tooth, a portion of a holder and a resilient insert.

FIG. 2 is a side elevational view of the tooth and holder in assembled position.

FIG. 3 is a longitudinal, horizontal, sectional view through a holder prior to installation of the tooth taken substantially along the line 3—3 of FIG. 2.

FIG. 4 is a sectional view also taken along the line 3—3 of FIG. 2 showing the parts in assembled position.

FIG. 5 is a transverse vertical sectional view taken substantially along the line 5—5 of FIG. 2.

FIG. 6 is an enlarged fragmentary sectional view taken substantially along the line 6—6 of FIG. 2.

FIG. 7 is a view similar to FIG. 2, of a modification wherein the hole for location of the insert is through the top and the bottom portions of the holder.

FIG. 8 is a sectional view taken substantially along the line 8—8 of FIG. 7.

FIG. 9 is a sectional view taken substantially along the line 9—9 of FIG. 8.

FIG. 10 is a view similar to FIG. 1, of a further modified construction wherein the holes for the insert extend horizontally transversely through the prongs of the tooth.

FIG. 11 is a sectional view, similar to FIG. 5 of the modification of FIG. 10.

FIG. 12 is a sectional view taken substantially along the line 12—12 of FIG. 11.

FIG. 13 is a view similar to FIG. 1, of a further modification wherein the holes for location of the insert extend vertically through the prongs.

FIG. 14 is a view similar to FIG. 2, of the modification of FIG. 13.

FIG. 15 is a sectional view taken substantially along the line 15—15 of FIG. 14.

FIG. 16 is a sectional view taken substantially along the line 16—16 of FIG. 15.

FIG. 17 is a view similar to FIG. 1, of still another modification wherein a plurality of resilient inserts is used to hold the tooth in place of the holder.

FIG. 18 is a view similar to FIG. 2, of the modification of FIG. 17.

FIG. 19 is a sectional view taken substantially along the line 19—19 of FIG. 18.

FIG. 20 is a sectional view taken substantially along the line 20—20 of FIG. 18.

FIGS. 21 to 24 are views similar to FIGS. 1, 2, 5 and 4, respectively, of a further modification.

FIGS. 25 to 27 are views similar to FIGS. 10 to 12, respectively, of another modification.

FIGS. 28 to 30 are views similar to FIGS. 13, 15 and 16, respectively, of another modification.

The present invention provides a detachable retention means for securing a tooth 11 to a tooth holder 12 which may be formed integrally with or suitably secured to earth-digging equipment, the attachment involving the use of a resilient insert 13.

In a preferred form of the invention, the tooth 11 has forwardly converging top and bottom distal surfaces 16, 17, terminating in a transverse, blunt, forward edge 18. Preferably, the side edges 19 of the tooth are vertical and parallel.

The proximal end of the form of tooth 11 herein illustrated is bifurcated by means of a slot 21 which extends forwardly from the proximal end of the tooth and terminates in a vertical forward end 22. Preferably, the side walls 23 of the slot are vertical and parallel. The slot 21 divides the proximal end of the tooth into two prongs 24 which are rectangular in cross-section having parallel top and bottom faces 26, 27. The rearward ends 28 of the prongs 24 are preferably transverse and vertical.

Tooth 11 is preferably formed of a hard, tough material which will resist the abrasion of the digging action of the equipment with which it is employed. As one edge of the blunt end 18 is worn, the tooth is preferably reversed until the entire distal portion is consumed. Further, if it is necessary to sharpen the end 18, this may be accomplished by grinding. When the tooth is entirely consumed, it may be replaced. The foregoing operations which are performed on the tooth require that it be held on the digging equipment in a detachable manner and yet that the tooth be securely restrained against unintentional displacement.

A preferred form of tooth holder 12 is mounted on earth-digging equipment or is integral therewith and in practice secures the tooth in a position as best shown in FIG. 2 slanted downwardly-forwardly for effective digging action, it being understood that this particular arrangement is subject to wide variation.

Tooth holder 12 is formed with vertically spaced top and bottom portions 31, 32, interconnected by a vertical web 33, so that in front elevation holder 12 has an H-shape with the H turned on its side and providing a pair of recesses 34 on either side of web 33 between portions 31 and 32. The inwardly facing top and bottom faces 36, 37 of recesses 34 are spaced apart the thickness of prongs 24 and the width of web 33 is equal to the distance between walls 23 of slot 21, it being understood that manufacturing tolerances require slight clearances to permit insertion and removal of the tooth.

A resilient retainer 13 is employed. In the form of the invention here shown, retainer 13 is round in cross-section and has a length greater than the thickness of web 33. A preferred material of construction is neoprene, a synthetic rubber, but it will be understood that other resilient materials, such as natural rubber, nylon cord, latex dipped cord, iron wire, and other materials may be used.

In the form of the invention shown in FIGS. 1 to 6, hole 41 extends transversely through web 33 spaced backwardly a short distance from the forward end 42 of the web which normally engages the end 22 of slot 21. Longitudinal grooves 43 of extended length are formed on either side wall 44 of web 33 rearwardly of hole 41. As best shown in FIG. 6, groove 43 has a depth substantially less than the diameter of hole 41 and has a width in a vertical direction substantially greater than said diameter 41.

When tooth 11 is assembled in holder 12, as a preliminary step the insert 13 is inserted through hole 41 so that it projects out into the recesses 34 on either side of web 33. Tooth 11 is then moved rearwardly into holder 12, the prongs 24 fitting into the recesses 34. When the rearward ends 28 of the prongs encounter the exposed ends of the insert 13 they force the insert rearwardly into the grooves 43. By reason of the dimensions of the grooves 43 as compared with the cross-section of the insert 13, the insert is deformed into the shape best indicated by reference numeral 46 in FIG. 6. Most importantly, there is an enlarged surface 47 of the insert in engagement with the side wall 23 of the slot 21 which frictionally engages wall 23 and more effectively prevents withdrawal of the tooth 11 from the holder 12 than in prior constructions of this general type. However, openings 48 are preferably formed in holder 12 rearwardly of the ends 28 of the tooth to permit a tool to be inserted and used to drive the tooth 11 forwardly against the frictional restraint of the portions 46 of insert 13.

FIGS. 7 to 9, inclusive illustrate a modification of the invention. Because essentially the tooth and holder are similar to the form shown in FIGS. 1 to 6, the same reference numerals followed by subscript *a* are used to designate corresponding parts. Hole 41 of the modification of FIGS. 1 to 6 is eliminated. In lieu of such a hole, four other holes 51 to 54 are provided, it being understood that one or more of said holes may be eliminated. Hole 51 is located extending through top portion 31*a* and into one of the recesses 34*a* immediately above the middle of one of the prongs 24*a* adjacent the forward end of holder 12*a*. Hole 52 is identical except that it is on the opposite side of the holder. Hole 53 is located in bottom portion 32*a* in vertical alignment with hole 51 and hole 54 is in the corresponding position on the other side of the tooth. Grooves 56 to 59, inclusive, are

formed in holder 12*a* immediately rearwardly of holes 51 to 54, respectively. Groove 56 is formed in top face 36*a* of one of the receses 34*a* immediately rearwardly of hole 51 in the direction of insertion of tooth 11*a*, and the other grooves are similarly located, it being understood that when one or more of the holes 51 to 54 is eliminated its corresponding groove is likewise eliminated. Each of the grooves 56 to 59 is wide and shallow and bears the same relationship to the holes as, in the preceding modification, grooves 43 bear to holes 41.

For each hole 51 to 54 there is provided a resilient insert 61 to 64, respectively. Such inserts are placed in the corresponding holes prior to insertion of tooth 11*a*, and as the tooth 11*a* is driven into the holder 12*a* the inserts 61 to 64 are bent backward into the corresponding grooves 56 to 59 and flattened, the deformed flattened portions of the inserts being indicated by reference numerals 66 to 69, respectively. Thus the inserts 61 to 64 function in a manner similar to the insert 13 of the preceding modification to frictionally restrain unintentional longitudinal displacement of tooth 11*a* from its holder 12*a*. It will be apparent that the tooth may be driven from its holder as by inserting an instrument through knockout openings 48*a*, or other means as required.

The modifications shown in FIGS. 10 to 12 are similar to those previously described, and parts similar to parts shown in FIGS. 1 to 6 are designated with the same reference numeral followed by the subscript *b*. In this form of the invention, horizontal, transverse holes 71 are formed in either prong 24*b* adjacent rearward ends 28*b* and located approximately midway between top and bottom surfaces 26*b*, 27*b* of prongs 24*b*. Grooves 72 are formed in side walls 44*b* of web 23*b* of holder 12*b*, extending forwardly from a point radially opposite the location of holes 71 in the assembled positon of tooth and holder toward the forward end 42*b* of web 33*b*. The cross-sectional shape of groove 72 as compared with the diameter of hole 71 is in approximately the same relationship as in the preceding modifications. Resilient inserts 73 are positioned in holes 71 prior to assembly to the tooth and holder. As the tooth is forced into the holder the inserts fit into grooves 72 and are deformed and compressed to the shape indicated by reference numeral 74. Removal of the tooth for replacement is accomplished in a manner similar to the previous modification.

Turning now to the modifications of FIGS. 13 to 16, the tooth 11*c* and holder 12*c* are generally similar to those of the preceding modifications with exceptions hereinafter noted and the same reference numerals followed by the subscript *c* are used to designate corresponding parts. In this modifications, vertical holes 76 are formed adjacent rearward end 28*c* of one or more of the prongs 24*c* extending through from top surface 26*c* to bottom surface 27*c*. Longitudinal grooves 77 are formed on either side of top and bottom faces 36*c*, 37*c* of recesses 34*c* of holder 12*c*. Said grooves extend from the front edge of holder 12*c* and terminate at a position approximately directly opposite the location of holes 76 in the assembled positon of tooth and holder. The cross-sectional shape of grooves 77 with relation to holes 76 is preferably the same as in the preceding modifications. Resilient inserts 78 are installed in each of the holes 76 prior to insertion of the tooth and as the tooth is forced into its holder, said inserts bend into the grooves 77 and are deformed and compressed as indicated by reference numeral 79. Removal of the tooth is essentially as in the preceding modifications.

In the modification of FIGS. 19, 20, the tooth and holder are similar to that shown in FIGS. 1 to 6 and the same reference numeral followed by the subscript *d* is used to represent corresponding parts. This form of the invention is particularly suitable for large size teeth or teeth which are subjected to extreme strain tending to separate the tooth from its holder. This modification is characterized by the use of a plurality of resilient inserts 13*d*, 14*d* instead of a single insert, the two cooperating and, by reason of the increased area of surface engagement, more effectively frictionally resisting disengagement.

Thus hole 41*d* is formed transversely through web 33*d* adajcent the forward end 42*d* thereof and positioned in the lower half of sidewall 44*d*. A second hole 40 is also formed transversely through web 33*d* in the upper half of sidewall 44*d*. Grooves 43*d* extend longitiudinally in either sidewall 44*d* rearwardly of hole 41*d*. Groove 43*d* has the same cross-sectional relationship to hole 41*d*, as in the preceding modifications. The assembled position of the tooth and holder resembles that in the preceding modifications, it being understood that insert 13*d* is deformed in portions 46*d* in grooves 43*d*, whereas insert 81 is deformed in portion 83. A second groove 82 is formed in side walls 44*d* of web 33*d* rearwardly of hole 40 and has a cross-sectional shape similar to groove 43*d*.

In the preferred form of the invention as herein shown, hole 40 is located rearwardly of hole 41*d* in the direction of insertion of the tooth so that prongs 24*d* first engage resilient insert 13*d* and then later engage insert 81. This relationship makes it easier to insert the tooth in its holder because the resistance to insertion is not as great as would be the case if the two holes were located the same distance from the front end of the holder.

The principle of using a plurality of resilient inserts instead of a single insert is applicable to the modifications shown in FIGS. 7 to 9, 10 to 12 and 13 to 16, as well as shown in FIGS. 17 to 20. One skilled in the art will understand that plural inserts may be used in place of single inserts in these modifications, as well as in the modifications hereinafter explained in detail. In addition, various combinations of the locations of the inserts shown in the accompanying drawings may be used.

The modifications of the invention shown in FIGS. 21 to 24, inclusive, resemble the form of the invention shown in FIGS. 1 to 6, inclusive, and the same reference numerals followed by subscript *e* are used to designate corresponding parts. In this form of the invention, hole 41*e* extends through web 33*e* in the same location as in FIGS. 1 to 6. However, the grooves 43 in the side edges 44 of web 33 are eliminated. In this modification of the invention, longitudinal grooves 86 are formed in sidewalls 23*e* of slot 21*e* from the rearward end 28 forwardly to a terminus approximately opposite hole 41*e* in the fully assembled position of the tooth. Preferably, the dimensional relationship of groove 86 relative to hole 41*e* is about the same as in FIGS. 1 to 6. It will thus be seen that in this modification of the invention the means of holding the tooth in its holder is essentially the same except that the grooves are formed in the tooth rather than in the toothholder. Although in FIGS. 1 to 6 the grooves are shown formed in the web, and in FIGS. 21 to 24 are shown formed in the tooth, nevertheless it will be clear to one skilled in this art that the grooves could be formed partially in the tooth and partially in the holder.

In the modification of FIGS. 25 to 27, the tooth and holder resemble those shown in FIGS. 7 to 9, and the same reference numerals are used to designate corresponding parts following by the subscript *f* rather than the basic numeral, or the subscript *a*. In this form of the invention, grooves 56 to 59 in surfaces 36*a*, 37*a* are eliminated, although holes 51 to 54 in portions 31*f*, 32*f* are formed. Grooves 87 are formed in the top and bottom surfaces 26*f*, 27*f* of each prong 24*f*, extending longitudinally from rearward ends 28*f* to a terminus approximately opposite holes 51*e* to 54*f*. Thus the resilient insert portions 66*e* to 69*e* are located in the grooves in the prongs rather than in the holder. In other respects, the functioning of the holder is essentially the same. It will further be understood that the grooves may be formed partially in the tooth and partially in the holder, if desired, the construction being readily apparent to one skilled in this art.

In the form of the invention shown in FIGS. 28 to 30, the tooth and holder resemble the form of the invention shown in FIGS. 13 to 16, in that holes 76*g* are formed located vertically in prongs 24*g*. The corresponding parts are designated by the same reference numerals as in FIGS. 13 to 16, following by the subscript *g*. In this form of the invention, grooves 77 in surfaces 36*c*, 37*c* are eliminated. In lieu thereof, grooves 88 are formed in the top and bottom surfaces 26*g*, 27*g* of prongs 24*g*. The means of holding the tooth in its holder is essentially the same as in the preceding modification. Here again it will be understood that the groove may be formed partially in the tooth and partially in the holder if desired, as will readily occur to one skilled in the art.

Although not illustrated herein, it will further be understood that the form of the invention of FIGS. 10 to 12 may also be modified by eliminating the grooves 72 in web 33*b*, substituting therefor grooves (not shown) in side walls 23 of tooth 11, extending forwardly from hole 71 in a longitudinal direction.

Although the foregoing invention has been described in some detail, by way of illustration and example for purposes of clarity of understanding, it is understood that certain changes and modifications may be practiced within the spirit of the invention and scope of the appended claims.

What is claimed is:

1. In combination in an earth-digging tool, a tooth portion formed of a hard piece of material with a tapered distal portion and a proximal portion, a holder portion formed with a recess to receive said proximal portion, one said portion formed with an aperture opening into said recess in the assembled position of said combination, one said portion formed with a groove communicating with said aperture and facing said recess, and a resilient insert partially in said aperture and partially in said groove and resiliently compressed in said recess between said tooth and holder to frictionally restrain withdrawal of said tooth from said recess, said groove having a depth substantially less than and a width substantially greater than the initial, uncompressed thickness and width, respectively, of said insert whereby the cross-sectional shape of said insert is substantially deformed as compared with its uncompressed shape and the area of surface contact between said insert and said portions is greatly enlarged.

2. The combination of claim 1, in which said aperture is formed in said holder.

3. The combination of claim 1, in which said aperture is formed in said tooth.

4. The combination of claim 1, in which said groove is formed in said holder.

5. The combination of claim 1, in which said groove is formed in said tooth.

6. The combination of claim 1, in which said insert is an elastomeric material.

7. The combination of claim 1, in which said insert is nylon cord.

8. The combination of claim 1, in which said insert is latex-dipped nylon cord.

9. The combination of claim 1, in which a plurality of apertures and grooves is formed in said portion, and a plurality of inserts provided, each said insert received in one said aperture and compressed in one said groove.

10. The combination of claim 9, in which one said insert is set back relative to the other said insert in the direction of insertion of said tooth portion in said holder portion.

11. In combination, a detachable tooth member, a tooth holder member, one of said members shaped with at least one recess having a first wall, said recess formed to receive at least a portion of the second of said members, said second member having a second wall in close proximity to said first wall and moving substantially parallel to said first wall as said second member portion is inserted in said recess in said first member, one said member formed with an aperture in its respective wall extending transverse to the direction of insertion of said tooth in said holder, one said member formed with a groove in its respective wall communicating with said aperture extending parallel to the direction of insertion of said tooth in said holder, and a resilient insert partially in said aperture and partially compressed in said groove and frictionally engaging the wall opposite said groove, the depth of said groove being substantially less than and the width of said groove being substantially greater than the corresponding initial, uncompressed dimensions of said resilient insert, whereby the area of frictional contact between said insert and the wall opposite said groove is materially increased.

12. The combination of claim 11, in which both said aperture and said groove are formed in the same wall.

13. The combination of claim 11, in which said aperture is formed in one of said walls and said groove in the other of said walls.

14. The combination of claim 11, in which said recess is formed in said tooth holder member.

15. In combination, a tooth formed of a unitary, hard piece of material, a tooth holder having a forward end formed with at least one recess extending rearwardly of said forward end, said recess having a side wall facing said recess, and top and bottom walls generally transverse to said side wall, said tooth and recess shaped so that said recess receives a portion of said tooth, a resilient insert, means to retain said insert in position normally compressed between one said wall and said portion of said tooth to resiliently, frictionally, detachably retain said tooth and holder together, one of said walls formed with a groove in which said insert is partially received, the depth of said groove being substantially less than, and the width of said groove being substantially greater than, the initial, uncompressed thickness and width, respectively, of said insert.

16. In combination in an earth digging tool, a holder shaped to receive the proximal end of a tooth, a tooth having its proximal end shaped to fit said holder, said tooth having a slot extending forwardly from the proximal end of said tooth to divide said proximal end into two discrete prongs, said holder formed with recesses each shaped to receive one of said prongs and having a web between said recesses substantially filling said slot, and a resilient insert carried by said holder and bearing against said tooth, one of the members of the group consisting of the holder and the tooth formed with a groove, said groove having a depth substantially less than, and a width substantially greater than, the initial, uncompressed thickness and width, respectively, of said insert, said insert partially in said groove.

17. The combination of claim 16, in which said groove is formed in said web.

18. The combination of claim 17, in which an aperture is formed in said web immediately forward of said groove, said insert partially received in said aperture.

19. In combination, a tooth formed of a unitary, hard piece of material and having a slot extending forwardly from the proximal end of said tooth to divide said proximal end into two discrete prongs, a tooth holder shaped to receive said prongs and having a web substantially filling said slot, at least one said prong formed with an aperture, said holder formed with a groove communicating with said aperture, and a resilient insert in said aperture and compressed in said groove and frictionally restraining withdrawal of said tooth from said holder.

20. The combination of claim 19, in which said aperture extends transversely through said prong normal to said web and said groove is formed in said web.

21. The combination of claim 19, in which said aperture extends transversely through said prong parallel to the height of the web and said groove is remote from said web.

22. In combination, a tooth formed of a unitary hard piece of material and having a slot extending forwardly from its proximal end to divide said proximal end into two discrete prongs, a tooth holder shaped to receive said prongs and having a web substantially filling said slot, said web formed with a first and a second aperture transverse to said slot, said web formed with a first and a second longitudinal groove rearward of said first and second apertures, respectively, and a first and a second resilient insert, each said insert in one said aperture and compressed in one said groove and resiliently restraining withdrawal of said tooth from said holder, said second aperture spaced rearward of said first aperture in a longitudinal direction and one of said apertures elevated relative to the other.

23. In combination, a tooth for earth digging equipment having a sharpened main working part and a connecting part, a holder formed with a recess to receive said connecting part, at least one wall of said recess formed with a hole and also with a groove extending

rearward of the hole in the direction of insertion of the tooth in the holder, and an elastic insert partially in said hole and partially compressed and deformed in said groove, the depth of the groove being substantially less and the width of the groove being substantially greater than the original diameter of the elastic insert and of the hole, the compressed and deformed elastic insert frictionally restraining unintentional withdrawal of the tooth from the holder.

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