

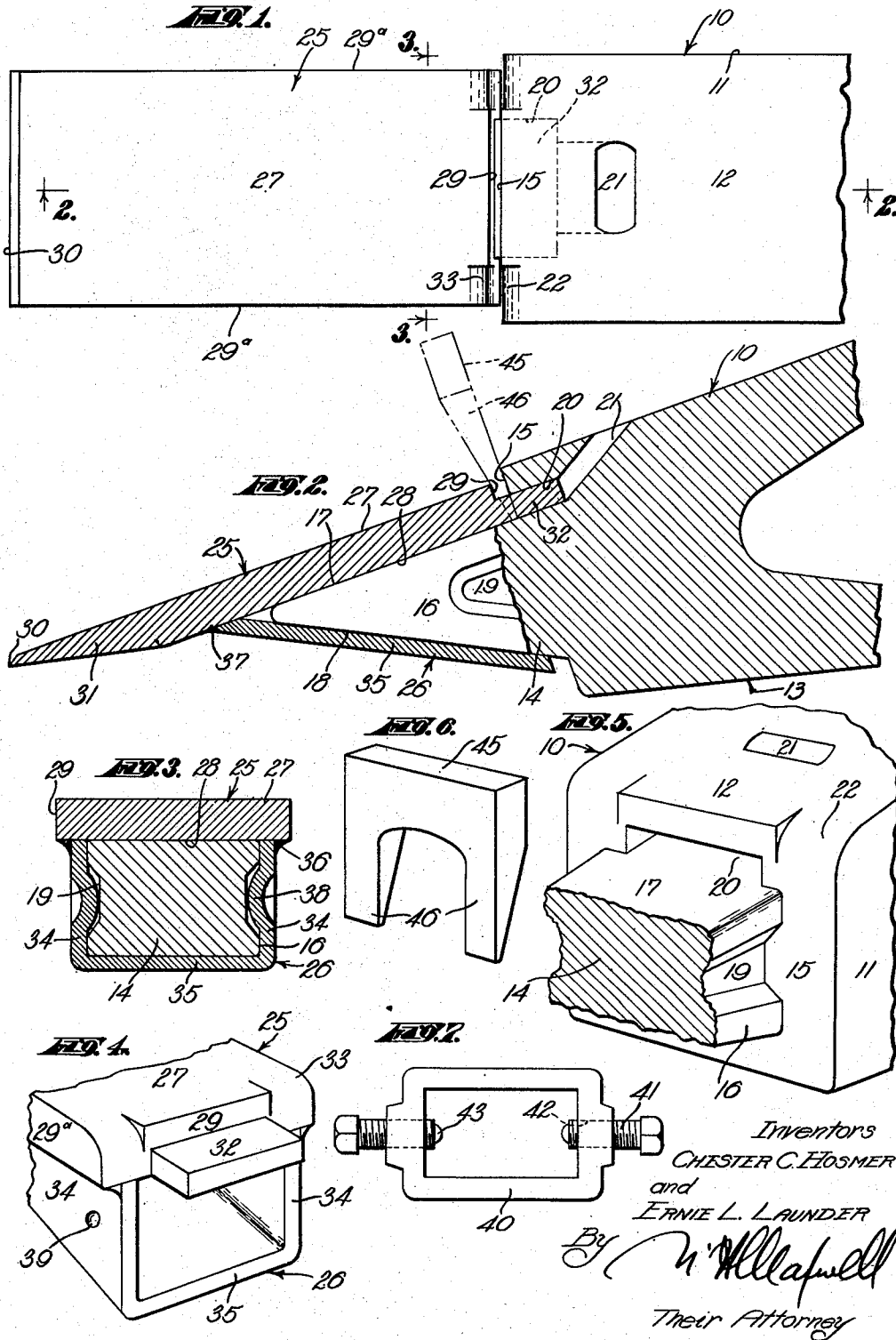
July 19, 1938.

C. C. HOSMER ET AL

2,124,230

DETACHABLE POINT FOR EARTH DIGGING TEETH

Original Filed Sept. 17, 1934 2 Sheets-Sheet 1.



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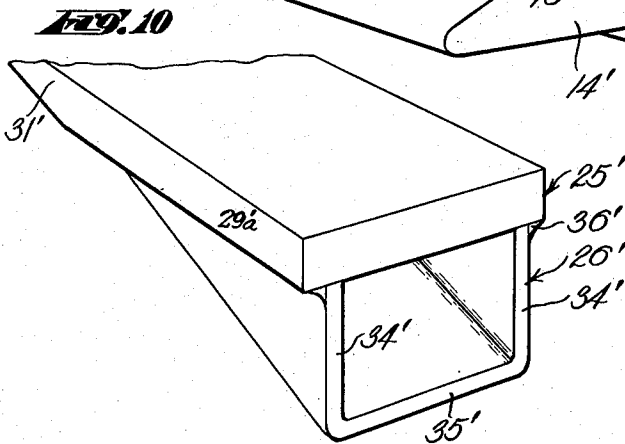
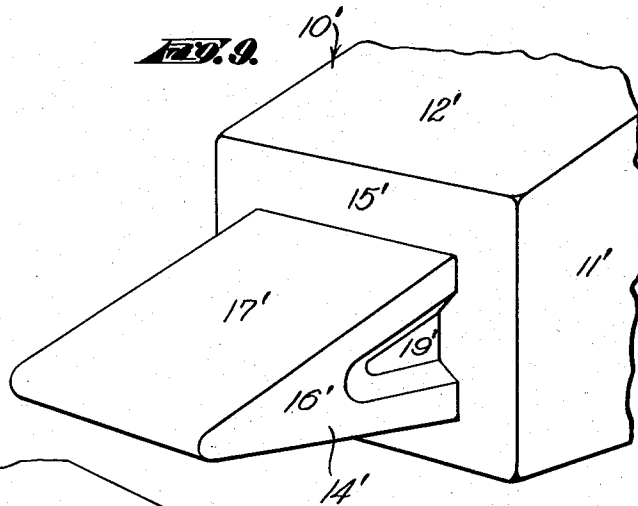
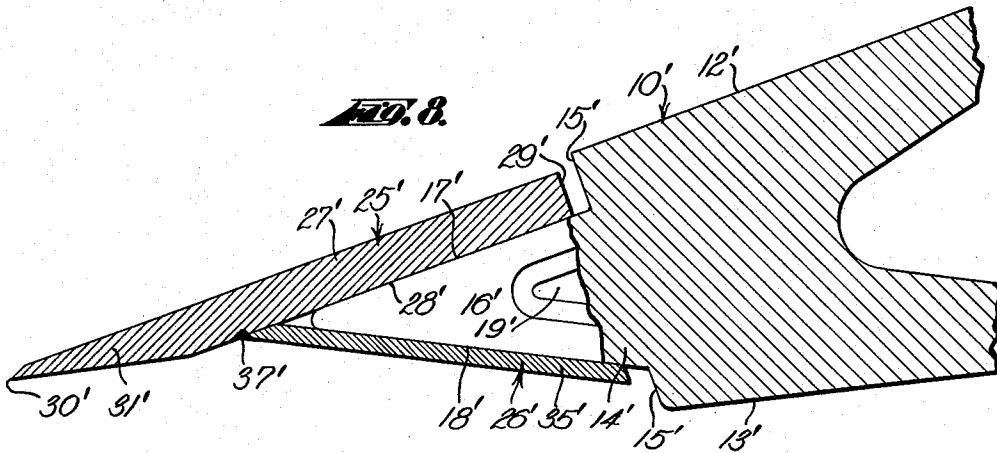
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2,124,230

DETACHABLE POINT FOR EARTH DIGGING TEETH

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Continuation of application Serial No. 744,330, September 17, 1934. This application March 8, 1937, Serial No. 129,582

14 Claims. (Cl. 37-142)

This invention relates to excavating apparatus and relates more particularly to the teeth of scarifiers and power operated shovels, ditchers, rooters, etc. A general object of this invention is to provide a practical, effective and long wearing replaceable cap or point for teeth of the character referred to.

This application is filed in substitution for and as a continuation of our application for United States Letters Patent Serial No. 744,330, filed September 17, 1934, which application was filed in place of our earlier application, Serial No. 625,640, filed July 29, 1932.

Another object of this invention is to provide a detachable and replaceable tooth point of the character mentioned that may be easily and quickly secured to a tooth to be rigid therewith.

Another object of this invention is to provide a point of the character mentioned that may be readily removed from the tooth or tooth base for repair, sharpening, or replacement.

Another object of this invention is to provide a replaceable tooth point of the character mentioned that is effectively and tightly secured to the tooth without the necessity of employing bolts, pins, keys, screws or other securing elements subject to failure, loosening or loss.

Another object of this invention is to provide a tooth point that embodies deformable or malleable parts adapted to be distorted or bent to cooperatively fit the tooth base to dependably and securely attach the point to the tooth or tooth base.

Another object of this invention is to provide a detachable point of the character mentioned having extensive bearing surfaces for cooperating with complementary surfaces of the tooth to resist or prevent working of the point relative to the tooth.

Another object of this invention is to provide a detachable tooth point of the character mentioned that has parts cooperating with the tooth base forming retaining means for retaining the point on the base and located to minimize racking or straining of the retaining means if the point works relative to the tooth base.

Another object of this invention is to provide a detachable tooth point having a hardened wear resisting digging or working portion and a softer mounting portion joined therewith and having

characteristics that facilitate its being effectively and securely joined with the tooth base.

Another object of this invention is to provide a detachable tooth point comprising a body of hard wear resisting material for acting on the earth or material handled and a malleable housing on the hard body for fitting over a part of the digger tooth and capable of being distorted or indented to form it with parts cooperating with the tooth to secure the point to the tooth.

Another object of this invention is to provide a replaceable tooth point of the character mentioned in which the hard body constitutes a spike projecting forwardly from the housing in a manner to penetrate the earth without interference by the housing and to protect the softer malleable housing against injury and wear.

Another object of this invention is to provide a tooth point including a hard spike forming body, a malleable housing on the body deformable to connect with a tooth base, and a tang for engaging the tooth base to take strains that might otherwise distort or over-strain the housing.

A further object of this invention is to provide a replaceable tooth point of the character mentioned that is simple and inexpensive to manufacture, repair and replace.

The various objects and features of our invention will be fully understood from the following detailed description of a typical preferred form and application of the invention, throughout which description reference is made to the accompanying drawings, in which:

Fig. 1 is a top or plan view of an improved replaceable point of the invention in position on a tooth or tooth base. Fig. 2 is a vertical detailed sectional view taken substantially as indicated by line 2-2 on Fig. 1. Fig. 3 is a transverse, detailed sectional view taken as indicated by line 3-3 on Fig. 1. Fig. 4 is a fragmentary perspective view of the inner end of the tooth point. Fig. 5 is a fragmentary perspective view of the outer portion of the tooth base with its outer part broken away. Fig. 6 is a perspective view of a wedge that may be utilized in removing the point from the tooth base. Fig. 7 is a reduced plan view or elevation of a device that may be employed for indenting the malleable box when the point is being applied to the tooth base. Fig. 8 is a view similar to Fig. 2 of another form of the

invention. Fig. 9 is a view similar to Fig. 5 of the form of the invention shown in Fig. 8, and Fig. 10 is a view similar to Fig. 4 illustrating a portion of the device shown in Fig. 8.

5 The replaceable tooth caps or points of the present invention may be constructed for use on teeth of various types and forms. In the following detailed description we will describe the invention as employed on a more or less conventional type of tooth which is suitably modified to receive the cap or point of the invention. It is to be understood that the invention is not to be construed as limited or restricted to the specific form or application about to be described, but that it is to be taken as including any features or modifications that may fall within the scope of the claims.

We will first describe the structure illustrated in Figs. 1 to 5 of the drawings.

20 The portion of the tooth base illustrated in the drawings may be considered as a part of a tooth such as may be used on dippers of power shovels, trenching machines, etc. The tooth illustrated includes what we will term a shank or base 10 which is substantially rectangular in transverse cross section. The base 10 has flat parallel sides 11 and flat upper and lower surfaces 12 and 13, respectively. In accordance with the usual practice the upper and lower surfaces 12 and 13 of the tooth base 10 converge forwardly or outwardly toward the outer end of the tooth. The shank 10 is provided with a reduced part 14 projecting forward from its outer end or face 15. The outer face 15 of the base 10 is substantially normal to its sides 11 and the reduced part 14 projects forwardly from the face 15 as an integral continuation of the tooth base.

35 The tooth part 14 where it joins the base 10 is of less vertical and horizontal extent than the face 15 of the base 10 and is located so that its sides are spaced inwardly from the sides 11 of the base and its top and bottom surfaces are spaced inwardly from the upper and lower surfaces 12 and 13 of the base. The sides 16 of the part 14 are substantially parallel while the top 17 and bottom 18 converge outwardly toward the outer end of the tooth making the part 14 wedge shaped. The top 17 of the tooth part 14 lies in a plane parallel with the upper surface 12 of the base 10 while the bottom surface 18 slopes upwardly and outwardly relative to the top 17 to join the top at the slightly rounded outer end of the part 14. Indentations or recesses 19 are provided opposite each other in the sides 16 of the tooth part 14. The recesses 19 are located about midway between the upper and lower edges of the sides 16 and terminate a short distance forward of the face 15 from which the part 14 projects. The walls of the recesses 19 preferably taper or converge inwardly as best illustrated in Figs. 3 and 5 of the drawings.

60 A socket or opening 20 extends rearwardly into the base 10 from its outer face 15. The opening 20 is polygonal or rectangular and extends into the base 10 from adjacent the top 17 of the part 14. The lower wall of the opening 20 forms an unbroken continuation of the top 17 of the tooth part 14. A downwardly and outwardly inclined opening 21 extends from the upper surface 12 of the base 10 to the inner end of the opening 20. The opening 20 is of less width or transverse extent than the part 14 and the opening 21 may be of less width than the opening 20. In the form of tooth base shown on Sheet 1 of the drawings bevelled or rounded surfaces 22 join or con-

nect the upper surface 12 and the forward face 15 of the base 10. The surfaces 22 are spaced apart and are out of vertical alignment with the opening 20. They are preferably located at opposite sides or beyond the ends of the opening 20.

The improved cap or point of the present invention includes, generally, a body 25 forming a spike and a housing 26 on the body for mounting it on the tooth base.

5 The body 25 constitutes the active earth engaging element of the point. The body 25 is a plate-like member and may have flat parallel upper and lower surfaces 27 and 28. In the particular form of the invention illustrated the body 25 is rectangular in plan elevation having straight, parallel inner and outer ends 29 and 30, and parallel edges 29^a. The point body 25 is elongate and has its longitudinal axis parallel with the longitudinal axis of the tooth base 10. It is to be understood that the body 25 may have a shape or configuration different than that illustrated. The outer or forward portion of the body 25 has its lower surface 28 bevelled to be in convergent relation to the upper surface 27 whereby the outer portion of the body 25 constitutes what we will term a spike 31 for digging into or penetrating the earth. The outer or forward edge 30 of the body 25 is preferably bevelled or sharpened, as illustrated.

25 When the point or device is in position on the tooth base 10 the lower surface 28 of the body 25 bears flatly against the top 17 of the tooth part 14 and the spike 31 projects or extends forwardly beyond the part 14. In accordance with the invention the body 25 is formed of a hard material to resist the abrasion and wear to which it is subjected when the tooth is in service. The invention contemplates the formation of the body 25 of any suitable hard, wear resisting material. In practice, the point body may be formed of a type of steel subject to being heat treated to obtain a high degree of hardness and the necessary degree of toughness to stand the abrasion and shock occurring during operation. In practice we employ a high carbon alloy steel, such as chrome vanadium or chrome molybdenum steel.

40 In accordance with the invention as shown in Figs. 1 to 5, the body 25 has a tongue or tang 32 projecting from its inner end 29. In the preferred construction the tang 32 is integral with the body 25. The tang 32 is proportioned to fit into the above described socket or opening 20 and is of less thickness than the body 25 and of less width than the body. The lower side of the tang 32 forms an unbroken continuation of the lower surface 28 of the body 25 to bear against the lower wall of the opening 20 when the lower surface 28 of the body is in bearing engagement with the top 17 of the part 14. In practice the tang 32 fits the opening 20 closely to have its edges or sides as well as its upper and lower surfaces in cooperation with the walls of the opening 20. The tang 32 cooperating with the opening 20 materially assists in transmitting the active or operating forces between the body 25 and the tooth base 10, as will be more fully described. The body 25 may have bevelled or rounded surfaces 33 connecting or joining its upper surface 27 and its inner end 29. The rounded surfaces 33 are spaced at opposite sides of the tang 32 to be opposite the rounded surfaces 22 of the base 10 when the point is in position on the base.

70 The housing 26 is provided to embrace or engage the tooth part 14 and has malleable parts 75

adapted to be indented into the recesses 19 to removably secure the point to the tooth base 10. The housing 26 is formed on or secured to the under side of the body 25 and is shaped and proportioned to rather closely or snugly receive the tooth part 14. In accordance with the invention the housing 26 is substantially channel-shaped or U-shaped in transverse cross section having spaced side walls 34 and a bottom wall 35 extending between and connecting the walls 34. The side walls 34 are preferably flat and parallel and lie against or adjacent the sides 16 of the tooth part 14 when the point is in position on the tooth base. The bottom wall 35 of the box 26 is flat and inclined upwardly and outwardly toward the forward end or spike 31 of the body 25 to lie against or adjacent the bottom 18 of the tooth part 14. The side walls 34 are triangular in side elevation having their upper ends inclined downwardly and forwardly to conform to and engage against the lower surface 28 of the body 25. The forward end of the bottom wall 35 is likewise adapted to engage against the lower surface 28 of the body 25. The inner or rear end of the housing 26 is open to receive the tooth part 14 so that the point may be readily slid over the part 14.

The housing 26 is rigidly secured to the point body 25 so that the two elements form a unit. In practice the housing 26 is integrally connected with the body 25 by welding 36 which joins the upper edges of the side walls 34 to the lower side of the body 25. The forward end of the bottom wall 35 is welded to the lower side of the body 25 at 37. With the body 25 and the housing 26 connected or assembled as just described the body 25 closes the upper side of the housing 26. When the detachable point is in place on the tooth part 14 the lower wall 35 engages the bottom 18 of the part 14 and the lower surface 28 of the body 25 engages the top 17 and the lower surface of the tang 32 has extensive bearing on the part 14 and these parts are related so that the rear end 29 of the body 25 is spaced a short distance from the face 15 of the tooth base. With this relationship of the parts the rounded surfaces 22 and 33 are spaced apart. The housing 26 is formed to closely or snugly receive the tooth part 14 so that its inner surfaces and the lower surface 28 of the body 25 have extensive bearing engagement with the surfaces of the part 14.

It is a feature of the invention that the sides of the housing 26 are deformable or malleable. The housing 26 is formed of malleable steel, or the like, as hereinafter described, and its side walls 34 are somewhat thinner than the point body 25 so that they can be distorted in the desired manner. The housing 26 is formed so that its side walls 34 may be indented or pressed inwardly to have inwardly projecting parts 38 occupying or cooperating with the recesses 19 in the sides 16 of the tooth part 14. The parts 38 are opposite each other in coincident relation with a transverse axis which is at right angles with the longitudinal axis of the tooth. The parts 38 cooperate with the recesses 19 to dependably secure the detachable point to the tooth base 10. As initially formed for arrangement on the part 14 the side walls 34 are flat and parallel so they can be easily slid over the part 14. If desired, relatively small depressions 39 may be provided in the outer surfaces of the side walls 34 to indicate the points at which the side walls are to be indented.

In accordance with our invention the tooth point provided has a hardened tough body and a housing 26 on or joined with the body to have

malleable side walls that can be indented to extend into the recesses 19. The body and housing are preferably welded together and the body heat treated, the housing 26 being formed of steel that will not take a hardness through heat treating which hardens the body 25, or which can be annealed after the body has been hardened. We prefer to form the box or housing 26 of a soft or mild steel that will not take hardness.

To apply the point to the tooth base 10 the housing 26 and body 25 are first slid over the tooth part 14, that is, they are moved inwardly relative to the tooth base 10 so that the part 14 is received in the housing 26. At the same time that the point 14 is being received in the housing 26 the tang 32 is entered in the opening 20. The detachable point may be moved inwardly on the part 14 until the top and bottom surfaces 17 and 18 of the wedge-shaped part 14 cooperate with the under surface 28 of the body 25 and the inner surface of the bottom wall 35 to stop further movement. The point is then in position to be secured to the tooth base 10. To secure the detachable point to the tooth base 10 the side walls 34 of the housing 26 are indented to have the parts 38 fit into or cooperate with the recesses 19. It is to be understood that the side walls 34 of the housing may be indented or depressed in any suitable or convenient manner.

In Fig. 7 of the drawings we have illustrated a tool that may be conveniently employed to distort the side walls 34 to form the parts 38. This tool comprises a rectangular frame-like body 40 and screws 41 threaded through openings 42 in the ends of the tool body 40. The tool body 40 is adapted to be passed over the outer end of the detachable point to a position where the inner ends of its screws 41 are opposite the depressions 39. The inner ends of the screws 41 may carry hardened balls 43 for cooperating with the side walls 34 of the housing 36. The depressions 39 may serve to center or locate the screws 41. When the screws 41 are threaded inwardly they operate to indent or press inwardly the side walls at the desired points to form the parts 38 which extend into or cooperate with the recesses 19. These inwardly bent parts 38 are in the nature of projections or raised portions on the inner surfaces of the walls 34 which engage the walls of the recesses 19 to firmly and securely attach the point to the part 14 of the tooth base 10.

In operation the excavating tooth may be employed in the manner usual to such devices. The spike portion or spike 31 of the body 25 projects forwardly from the housing 26 to have a very effective angle of penetration. It is to be noted that the outer end of the spike or body is below the lowermost plane of the housing 26 so that it may penetrate the earth without interference by the housing and so that it protects the housing 26 against wear and injury. The body 25 being formed of hard wear resisting material is long wearing and the point has a long life. In the case of downward load coming on the tooth the lower surface 28 of the body 25 cooperates with the top 17 of the part 14 and the lower wall of the opening 20 so that there is a direct transmission of operating loads and stresses to the part 14 of the tooth base 10. When the tooth is operated so that pressure occurs on the outer projecting end of the tooth or point tending to thrust or force the tooth inwardly toward the part 14, the point tends to wedge tightly on the part 14 and if the forces are sufficient the malleable housing may spread or give slightly, allowing the point to move inwardly on the part 14 until the

inner end of the body 25 at either side of the tang 32 bears against the face 15 of the base after which inward pressures are transmitted directly from the point body to the base. It will be apparent that if such slight movement or working occurs between the tooth point and the part 14 such movement or working does not interfere with or tend to disturb the connection which retains the point on the part 14. When in operation upward force occurs on the projecting outer end portion of the point body 25 and such force tends to lift the body upwardly off of the part 14, the tang 32 acts as a retaining means at the rear or inner end of the point body so that there is a tendency for the body to rock or turn about an axis in the vicinity of the point where the tang 32 joins the tooth body. Such tendency for the tooth or point body to turn is resisted by the housing embracing the part 14. The forward end of the part 14 fits into the housing close to the point where the housing is welded across its entire length to the body part 25 so that the housing cooperates with the end portion of the part 14 to effectively resist the tendency for the point body to turn or rock upwardly. The tang 32 being engaged in the socket is effective in preventing lateral working or shifting of the rear portion of the tooth point relative to the part 14 such as might otherwise tend to distort the malleable housing, causing the retaining means to work loose. It is to be observed that the transverse axis on which the indentations 38 are formed is so located that any clearance developing between the tooth point and the part 14, allowing the tooth point to work up and down at its outer end, has little or no tendency to force the indentations 38 out of cooperative engagement with the recess 19 in the part 14 and therefore, the indentations serve to effectively retain the point on the part 14 under severe working conditions.

In the form of the invention illustrated in Figs. 8, 9 and 10 the various elements 10', 14', 26', 36' and 31' and their parts correspond generally with the corresponding elements 10, 14, 26, 36, and 31, shown in Figs. 1 to 5, inclusive, except only that the tang 32 has been eliminated from the rear end of the point body 25'. In this case it is, of course, unnecessary to form the base 10' with an opening or socket to receive a tang. Further, in this modified form of the invention we have shown the parts without the rounded corners 22 and 33 hereinabove described, as this form of the invention is generally adapted for lighter use and smaller and lighter embodiments of the invention, in which case special projections may not be necessary to facilitate removing of the point for repairing or replacement. Further, in using smaller or lighter embodiments of the invention it may not be necessary to use special tools to form the retaining indentations 38 in the side walls of the point housing, it being possible to hammer such indentations in the housing with any tool ordinarily available.

When it becomes necessary or desirable to remove the point from the tooth base 10 the point is forced outwardly so that the indented parts 38 are pressed or forced outwardly from the recesses 19. In practice the detachable point may be forced from the tooth base 10 in any convenient or practical manner. In Fig. 6 of the drawings we have illustrated a wedge 45 that may be employed to remove the point from the tooth base 10. The wedge 45 has two depending wedge legs 46 and these legs 46 are adapted to be inserted between the pairs of opposing surfaces 22

and 23. The wedge 45 may then be driven inwardly so that its legs 46 wedge between the surfaces 22 and 33. The broken lines of Fig. 2 illustrate the wedge 45 in position to force or drive the point from the tooth base 10. The legs 46 cooperating with the rounded surfaces 22 and 33 are effective in forcing the point outwardly from the tooth base 10. If desired, a punch may be inserted through the opening 21 and driven against the inner end of the tank 32 to drive or assist in driving the point from the tooth base. When the point is driven from the tooth base 10 the tapered or inclined walls of the recesses 19 serve to bend or force the parts 38 outwardly so that the side walls 34 are substantially straightened or returned to their original condition. This permits the point to be reapplied to the tooth base 10 after sharpening.

The present invention provides a detachable and replaceable point for the teeth of excavating apparatus that is very inexpensive and that is long wearing. The point is formed so that it may be easily and quickly secured to a tooth base in such a manner that it cannot work loose or become detached when the tooth is in operation. The point is securely attached to the tooth base without the employment of bolts, keys, pins or the like, that are liable to become loose or displaced. The point is formed to have extensive bearing engagement with the surfaces of the tooth base so that the heavy stresses are directly transmitted to the base.

Having described only typical preferred forms and applications of our invention, we do not wish to be limited or restricted to the specific details herein set forth, but wish to reserve to ourselves any variations or modifications that may appear to those skilled in the art or fall within the scope of the following claims.

Having described our invention, we claim:

1. The combination with an earth digging tooth base having a lug projecting from its forward end and provided in its forward portion above said lug with an opening that is closed on both sides, top and bottom, the base having the end portions of its upper forward corner bevelled or rounded, of a tooth point including, a body, a housing on the body that receives said projecting lug, and a tang projecting rearwardly from the body for engagement in the said opening, the housing having the end portions of its upper rear corners bevelled or rounded.

2. In combination, an earth digging tooth base having a lug projecting from its forward end, there being a recess formed in the forward portion of said tooth base above said lug and the sides of said lug being recessed, and a tooth point including, a box-shaped rear portion for the reception of the lug on the tooth base, and a tang projecting from the upper rear portion of said point for engagement in the recess in said tooth base, the box-shaped rear portion of said point having side walls pressed into the recesses in the sides of said lug for securing the detachable point to said tooth base, the said side walls being pressed into the recesses on an axis transverse of the tooth point and of the direction of the major forces tending to move the point on the base when the structure is in use.

3. A detachable point for an earth digging tooth comprising, a body of hard wear resisting material, a housing of softer material on the rear portion of the body and including side walls integrally secured to the under side of the body, and a bottom wall whose forward end is remote from

the front edge of the body to leave a clearance space on the under side of the forward portion of the body, and a tang projecting rearwardly from the rear end of the body.

5 4. A detachable point for an earth digging tooth comprising, a body of hard wear resisting material, a housing of softer material on the rear portion of the body and including side walls integrally secured to the under side of the body,
10 and a bottom wall whose forward end is remote from the front edge of the body to leave a clearance space on the under side of the forward portion of the body, and a tang projecting rearwardly from the rear end of the body, the upper
15 rear corner of the body having rounded or bevelled portions.

5. In combination, an earth digging tooth base having a lug projecting from its forward end, there being recesses in the sides of the lug and
20 an opening in the upper portion of the tooth base at the rear of said lug, and a detachable point comprising, a body adapted to overlie the top of said lug, a housing secured to the under side of the rear portion of the body forming a cap to
25 receive the lug, and a tang projecting from the rear portion of the body to cooperate with said opening, the housing including side walls adapted to be pressed into said recesses to secure the point to the tooth base, on an axis transverse of
30 the tooth point and of the direction of the major forces tending to move the point on the base when the structure is used.

6. A tooth point adapted to be applied to a tooth base having opposite indentations in its
35 sides including, a separately formed hard wear resisting spike adapted to overlie and bear downwardly on the base and project forwardly beyond the base, and a malleable housing integrally joined with the spike forming therewith a
40 structure to embrace the base, the housing including parts adapted to overlie said indented sides of the base and to be distorted into their indentations to connect the point and base on an axis transverse of the tooth point and of the
45 direction of the major forces tending to move the point on the base when the structure is used.

7. A tooth point to be applied to a tooth base having recessed sides and a forwardly opening socket including, a hard wear resistant spike
50 adapted to overlie the base and project forwardly beyond the base, a tang on the spike to extend into the socket, and a housing with malleable sides integrally joined with the spike and forming therewith a structure embracing the base,
55 the housing including parts adapted to overlie said sides of the base and to be distorted into their recesses to connect the point and base on an axis transverse of the tooth point and of the direction of the major forces tending to move the
60 point on the base when the structure is used.

8. A tooth point adapted to be applied to a tooth base having indented sides including, a hard wear resisting spike adapted to overlie the base and project forwardly beyond the base, and
65 a malleable housing integrally joined with the spike forming therewith a structure surrounding the base, the housing including parts adapted to overlie said indented sides of the base and to be distorted into their indentations to connect the
70 point and base on an axis transverse of the tooth point and of the direction of the major forces tending to move the point on the base when the structure is used, the housing being spaced rearwardly from the forward projecting end portion
75 of the spike.

9. A tooth point adapted to be applied to the forward part of a tooth base, the sides of said part being recessed including, a wear resisting body adapted to overlie said part of the base to bear against its upper surface and to project
5 forwardly beyond said part, and a malleable housing secured to the under side of the body to embrace said part, the housing including portions adapted to be distorted into the recessed sides of the said parts to secure the point to the base,
10 the body having bearing engagement with said upper surface rearward of the common transverse axis of the distorted portions to prevent working of the point about said axis.

10. A tooth point adapted to be applied to the forward part of a tooth base, the sides of said part being recessed including, a wear resisting body adapted to overlie said part of the base to bear against its upper surface and to project forwardly beyond said part, and a malleable housing
20 secured to the under side of the body to embrace said part, the housing including side walls adapted to be distorted into the recessed sides of the base part to secure the point to the base, the body having bearing engagement with the upper
25 surface of the base part forwardly and rearwardly of the transverse axis of the connection formed by the distorted side walls.

11. A tooth point adapted to be applied to the forward part of a tooth base, the sides of said
30 part being recessed including, a wear resisting body adapted to overlie said part of the base to bear against its upper surface and to project forwardly beyond said part, and a malleable housing secured to the under side of the body to embrace
35 said part, the housing including portions adapted to be distorted into the recessed sides of the said part to secure the point to the base, the body and base having cooperating parts spaced rearwardly of the distorted portions to prevent
40 lateral working of the point on the base.

12. A tooth point adapted to be applied to a tooth base having a forward end face, recesses in its sides and a forwardly opening socket in said
45 end face, the point including a spike body adapted to overlie the base to bear on its upper surface and to project forwardly beyond the base, a malleable housing secured to the under side of the body and adapted to receive the forward part of the base, the housing including sides adapted to be forced into said recesses to attach the point
50 to the base, the spike body and the housing having their rear ends in a common plane and in opposing and parallel relation to the forward end face of the base, and a tang projecting from the rear end of the spike body and cooperating with said opening to assist in preventing working of the
55 point on the base.

13. In combination, a digging tooth having an outer face and a lug protruding forwardly from
60 said outer face and spaced below the upper side of the tooth, and a point for the tooth comprising a spike body for bearing against the upper side of the lug, and a housing of material softer than the spike body integrally secured to the under side of the spike body and including a lower wall for engaging the under side of the lug and side walls indented to grip the opposite sides of the lug on an axis transverse of the point and of the direction of the major forces tending to move the point
70 on the lug when the structure is operating, the inner end of the spike body opposing and being substantially parallel with said outer face of the tooth.

14. In combination, a digging tooth having a 75

substantially flat outer face and a lug protruding forwardly from said outer face and spaced below the upper side of the tooth, the opposite sides of the lug being indented, and a point for the tooth comprising a hard wear resistant spike body engaged on the upper side of the lug with its inner end opposing the outer face of the tooth, and a box integrally secured to the spike body and embracing the lug, the box including malleable side

walls having straight continuous edges bearing against said face, the walls being indented to substantially conform to the sides of the lug to detachably secure the point to the tooth on an axis transverse of the point and of the direction of the major forces tending to move the point on the lug when the structure is operating.

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