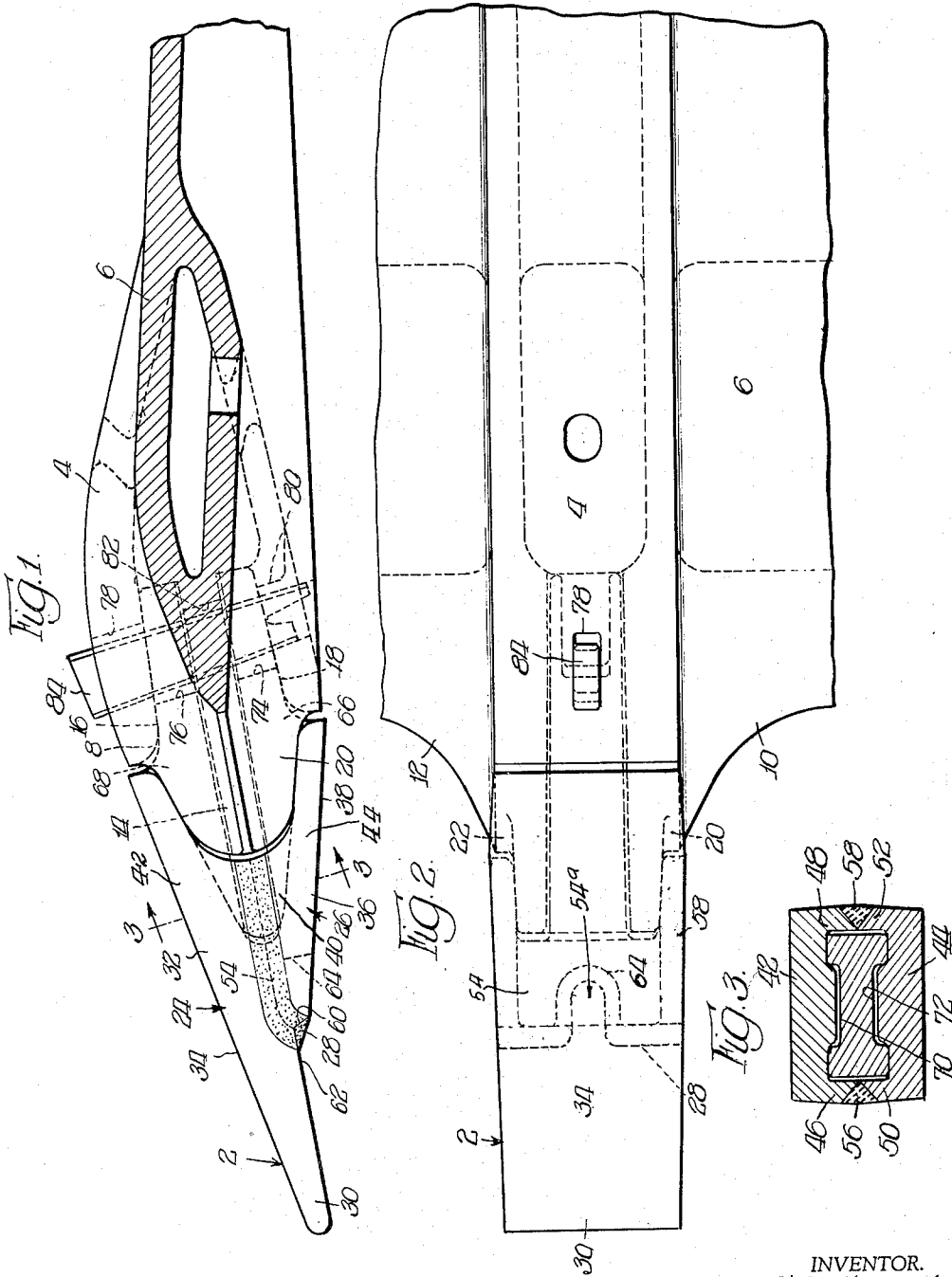


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DIPPER TOOTH ASSEMBLY
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DIPPER TOOTH ASSEMBLY

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1 Claim. (Cl. 37-142)

The present invention relates to improvements in dipper teeth, and particularly dipper teeth in which the points are replaceable and reversible, if desired, with respect to the base portions of the teeth.

Heretofore in the manufacture of dipper teeth, it has been thought necessary and advisable to use replaceable points formed of castings and usually of some special cast metal particularly adapted for resisting abrasion and wear. These teeth have been found satisfactory in service in a majority of cases, but the same are relatively expensive as compared to other tooth points, and under certain circumstances it has been found that tooth points formed as forgings will stand up better under abrasion than the usual cast points, hold their sharpness longer and can be re-sharpened more readily.

It is therefore an object of the present invention to provide a form of construction applicable generally to various designs for replaceable and/or reversible points of dipper teeth wherein the points may be constructed of a plurality of parts, said components of the tooth being in the form of forgings and the said parts being secured together in any desired manner, preferably by welds or the like.

Still another object of the present invention is to provide a novel construction for the points of dipper teeth which can be easily and readily manufactured and assembled at relatively low cost as compared to former constructions, this proposed novel assembly for such points comprising a plurality of forged parts suitably secured together to form a working point and including suitable securing means for attaching the point to a base or body for the tooth assembly.

The present invention further contemplates providing points for dipper teeth assemblies formed of a plurality of forged parts which can be readily replaced as desired and are of such a construction that under a good many conditions will stand up under abrasion, hold their sharpness longer, and can be resharpened more readily than points of similar construction but formed as castings.

Another object within the purview of the present invention is to provide a novel point assembly for dipper teeth and the like comprising a plurality of parts wherein the parts are so secured as by means of a plurality of welds or the like that said parts will maintain their operative relation with one another, even after excessive wear. This condition is provided for in the present assembly by forming the two parts in such

a way that securing means, or a part thereof, in the nature of a weld, is protected from abrasion during the operation of the teeth, thus providing at all times a construction wherein the parts can be retained in operative relation during the entire period of its life.

Other objects, features, capabilities and advantages are comprehended by the invention, as will later appear and as are inherently possessed thereby.

Referring to the drawing:

Figure 1 is a fragmentary view in cross section of an excavating dipper showing as a part thereof a tooth assembly made in accordance with the present invention;

Figure 2 is a fragmentary top plan view of the dipper and tooth assembly of Figure 1 of the drawing; and

Figure 3 is a view in cross section taken in the plane represented by line 3-3 of Figure 1 of the drawing.

Referring now more in detail to the drawing, an embodiment selected to illustrate the present invention comprises a tooth point 2 secured to a tooth base or housing 4 at or adjacent the forward cutting or working edge of an excavating dipper, generally referred to as 6. In the illustrative example of the present invention, the point is received within a recess 8 formed within the housing 4 adjacent the forward edge of the dipper 6. This tooth assembly is one of a plurality projecting from the forward edge of the dipper 6 and the adjacent housings 4 thereof are reinforced laterally as by means of the webs 10 and 12 extending therebetween. The recess 8 is constructed with a reinforcing partition 14 dividing said recess into sockets 16 and 18, the forwardly projecting web 14 being reinforced laterally by oppositely disposed walls 20 and 22 into which webs 10 and 12 merge, these walls 20 and 22 extending forwardly of the sockets 16 and 18 form in effect, a forwardly presented wedge-shaped nose that enters into bearing relation with the point 2, as will be hereinafter more fully disclosed.

The point 2, in the illustrative embodiment, has been constructed in accordance with the present invention so as to include two parts 24 and 26, which are formed as forgings and secured together as by means of a weld or the like, as will later more fully appear. The part 24 is provided with a working tip 30 and a working portion 32 to the rear thereof which includes the upper working surface 34, while the part 26 has the working portion 36 formed with a work-

ing surface 38, these working surfaces 34 and 38 converging outwardly to provide a wedge-shaped tooth-point terminating in the working tip 30, while the inwardly divergent portions of the members 24 and 26 constitute the jaws of a bifurcated tooth-structure and receive between them the forward portions 20, 22 of the base which are in the form of a wedge; said jaws being held against spreading under the stresses imposed by said wedge as will hereinafter appear.

The point as a unit includes the reinforcing jaws or walls 40 extending between the top and bottom walls 42 and 44 of the point which are formed in part by wall portions 46 and 48 of part 24 and in part by wall portions 50 and 52 of part 26, these wall portions abutting along the line 54 on both sides of the point and extending longitudinally thereof. Abutting surfaces 54 outlined by transverse weld seam 28 and the laterally disposed longitudinal weld seams 58 provide the two forgings with firm bearing areas forward of the crotch formed by jaws 42 and 44 and in rear of the transverse weld seam 28. The union of the forgings at this area 54 may be strengthened if desired by deflecting the transverse weld seam around a tongue 54a carried by elongated forging 24 and extending into and welded to the fore-shortened forging 26 as shown in Figure 2. Adjacent the abutting surfaces 54 of the point the parts 24 and 26 are formed with sloping surfaces, such as 56, providing substantially V-shaped grooves for receiving welding material 58. The welding material 58 on the sides of the point constitutes a continuation of transversely disposed weld material 28 deposited between a forwardly presented sloping shoulder 60 at the end of part 26 and a surface 62 of the part 24 which together form a substantially V-shaped recess for said weld material. The part 26, substantially centrally with respect to the sides thereof, is constructed with an inset 64 or vertically thickened portion corresponding to a reentrant portion or recess in the member 24 and providing a substantial abutment between the two members extending rearwardly from the shoulder 60 leaving between said shoulder and the intermediate portion of the member 24, a weld-seam groove extending transversely across the point and providing a substantial continuation of laterally disposed weld-seams 58. This inset is in the form of a cut-out portion for the part 26 so that the weld material 28 disposed therein is not exposed to as much wear from abrasion as the remaining parts of said weld material. Because of the protection given the weld material 28 within the inset, parts 24 and 26 are held together either alone by the weld within the inset 64, or the same assisted by weld material 58 on the sides of the point, even though the remaining parts of the weld material 28 are worn away because of excessive wear and abrasion.

The forgings 24 and 26 of the point 2 between walls 40 are formed with spaced tang or securing members 66 and 68, respectively, which are received within sockets 18 and 16 and fit within recesses 70 and 72 provided in the upper and lower surfaces of the reinforcing web 14 to prevent excessive transverse or angular movement of the point in respect to its mounting. These tangs 66, 68 by bearing against the outer walls of their sockets, are caused to hold in firm occlusion, the abutting surfaces 54 on the two forgings 24, 26, that lie forward of the crotch of the jaws 42, 44, and rearward of the trans-

verse seam-weld 28 and thus prevent weaving or lost motion under heavy transverse lifting stresses encountered by the tooth, and render sturdy the assembly connection between the forgings notwithstanding said connection is limited to weld-seams coincident with meeting margins or outlines of the forgings. These securing members adjacent the rear end thereof are provided with substantially aligned openings 74 and 76, respectively, disposed in association with the aligned top and bottom openings 78 and 80 formed in the housing 4 and the opening 82 provided in the reinforcing web 14, which is also in alignment therewith, these openings being adapted to receive a securing key 84 driven home into abutting relation with the rear walls of openings 74 and 76 and the forward walls of openings 78, 82 and 80.

The forward reinforcing walls 20 of the tooth base are arcuately arranged adjacent their forward end to conform with complementary arcuate surfaces formed at the rear of side walls 40 of the point, these wall surfaces cooperating to prevent twisting and turning of the tooth during its operation.

As above set forth, parts 24 and 26 are so constructed in the present embodiment that the same can be formed as forgings with ease and facility and assembled by means of a weld to form a point of unitary and rigid construction particularly adapted to withstand stress and strain and abrasive wear. The multi-part construction above described wherein the parts are forgings and are welded together results in a tooth point which will, under certain conditions, stand up better under abrasion, hold its sharpness longer, and be more readily re-sharpened than former constructions which embody a cast metal point as an element in the assembly. These parts, so constructed and secured together, form a finished point which can be made at a relatively lower cost than castings, and under the conditions referred to is equally as effective and efficient for digging operations.

The construction as shown contemplates a reversible point which may be reversed after wear to prolong the life thereof.

From the foregoing description it will be seen that the present invention contemplates a digging tooth comprising a base or body portion, having a forwardly presented wedge-shaped nose and a replaceable tooth-point of bifurcated construction having rearwardly divergent jaws forming a crotch in which the nose is seated substantially as disclosed in United States Letters Patent No. 2,007,991, issued to my assignee under date of July 16, 1935, upon the invention of Donald H. Young; and particularly a tooth of this general type in which the construction of that portion of the tooth-point concerned with its assembly upon the tooth base is modified to permit the tooth-point to be produced by the art of forging and still be firmly mounted upon its base; that is to say, may be made of two separate forgings constituting complementary tooth-point members on opposite sides of an intermediate longitudinal plane intersecting the sides of said tooth-point; which said forgings are held in assembly by weld-seams uniting margins of the forgings that meet approximately in said plane along the sides of the tooth-point and on a transverse line that extends across the tooth-point; said transverse line being sufficiently forward of the nose-receiving crotch to cause the transverse weld-seam in connection 75

with the side weld-seams to define intermediate occluding faces upon the two forgings; and the forgings having formed integrally thereon independent tangs that extend rearwardly into separate sockets in the base, whereby the weld seams are largely relieved of stresses from the wedging nose that tend to tear the seams asunder; and the said forgings being further strengthened in their assembly, if desired, by an integral tongue on the intermediate face of one forging, extending into and exposed for welding within a slot in the occluding intermediate face of the other forging.

As further or adjunctive conditions incident to its preferred embodiment, the invention contemplates elongating one separately forged tooth-point member to provide the principal part of the penetrating point thereon, foreshortening the complementary forged member in a manner to provide between its forward end and an intermediate portion of the elongated forged member, the welding groove for the transverse weld-seam that merges with the two longitudinal weld-seams that lie along the sides or cheeks of the tooth-point and along any strengthening webs or sidewalls used to tie together the divergent jaws of the tooth-point; also designing the forward end of the fore-shortened tooth-point forging with a vertical offset or enlargement that enters a reentrant recess in the intermediate portion of the elongated forging and thereby strengthening the welded connections between the forgings forward of the wedge-seating crotch.

The invention as above described is shown as being incorporated in a dipper tooth assembly conforming in certain respects to previous designs insofar as the operation and arrangement

of the elements are concerned, and it will therefore be apparent that said invention is of general utility in that the same can be embodied in dipper tooth assemblies which have been made in the past of cast material. The principles of construction are therefore applicable to said other and varied designs for dipper teeth.

While I have herein described and upon the drawing shown an illustrative embodiment of the invention, it is to be understood that the invention is not limited thereto but may comprehend other constructions, arrangements of parts, details and features without departing from the spirit of the invention.

I claim:

A tooth for excavating implements comprising a tooth-base constructed with a forwardly presented tooth-point receiving nose; and a tooth-point constructed with a pair of rearwardly divergent jaws forming a crotch that receives said nose; said tooth-point being composed of two separate forgings constituting complementary members of said tooth-point on opposite sides of an intermediate longitudinal plane intersecting the sides of said tooth-point; said forgings having margins through which they meet substantially in said plane along the sides and on a transverse line across said tooth-point, and weld-seams uniting said margins; said forgings having abutting faces covering an area forward of the crotch and defined by their marginal weld-seams, and one of said forgings having upon its abutting face a tongue that extends through the abutting face of and is welded to the other forging.

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