March 3, 1936. D. GRAHAM 2,032,875

LAMINATED TOOTH POINT

Filed June 9, 1934 3 Sheets-Sheet 1

Fig. 1

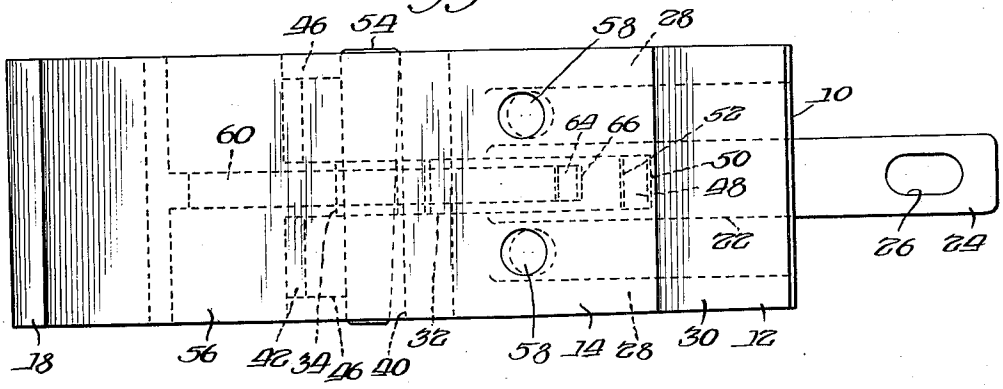


Fig. 2

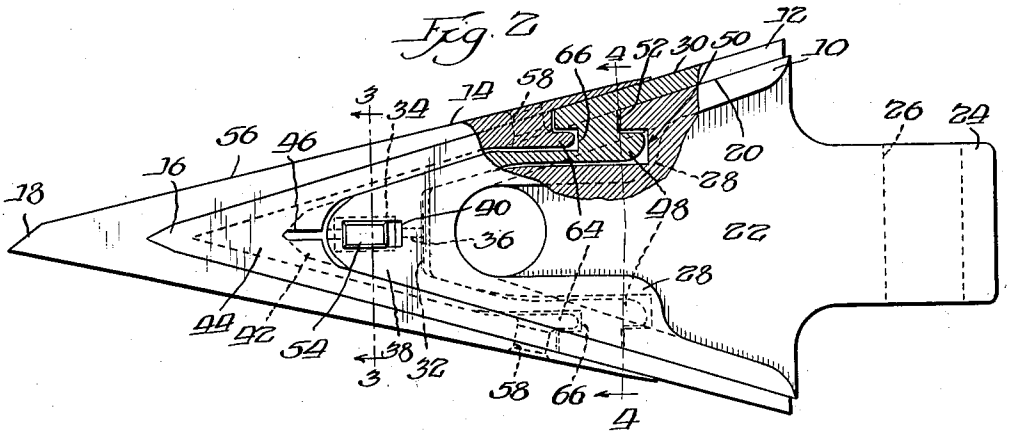
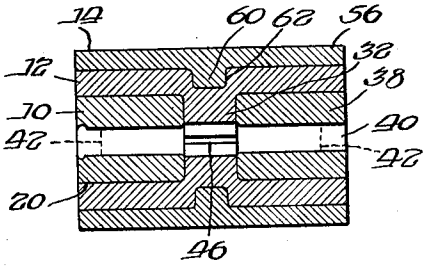


Fig. 3.



Witness:
R. B. Davison.

Inventor:
Dwight Graham:
By: Wilkinson Stuckley Byron & Knight
Attys

March 3, 1936. D. GRAHAM 2,032,875

LAMINATED TOOTH POINT

Filed June 9, 1934 3 Sheets-Sheet 2

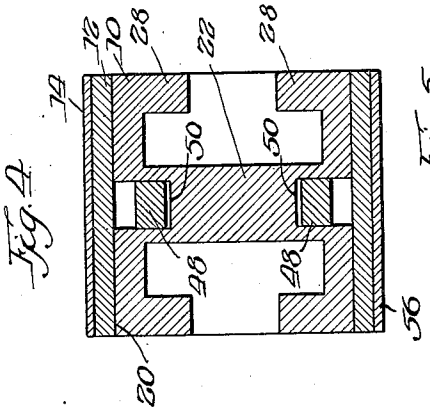


Fig. 4

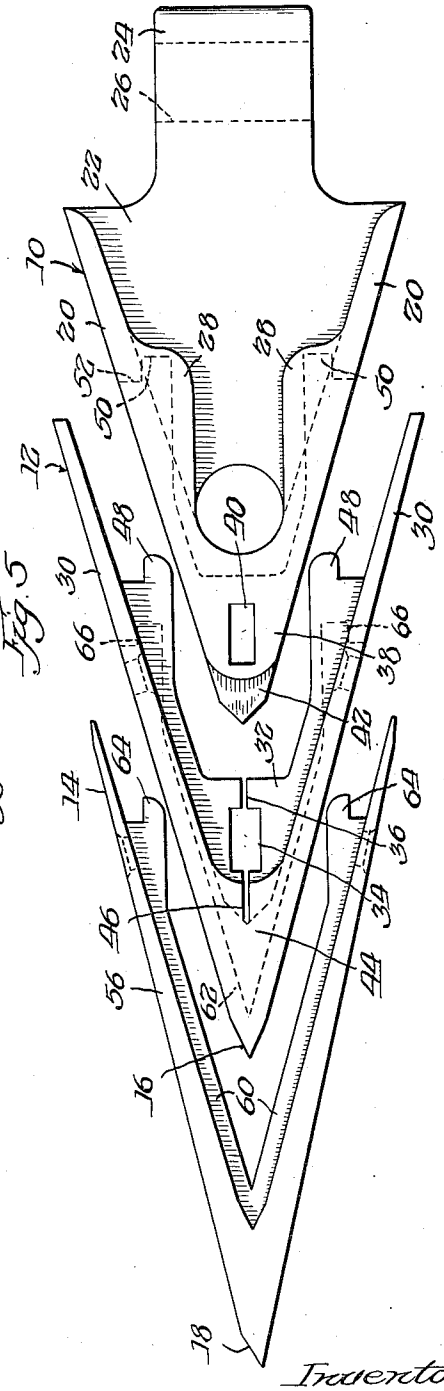


Fig. 5

Witness:
R. B. Davison.

Inventor:
Dwight Graham:
By Wilkinson Huxley Byron & Knight
Attys.

March 3, 1936. D. GRAHAM 2,032,875

LAMINATED TOOTH POINT

Filed June 9, 1934 3 Sheets-Sheet 3

Fig. 6

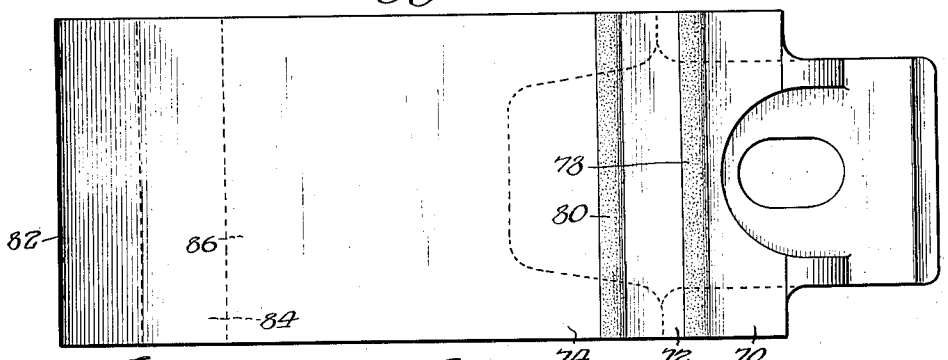


Fig. 8

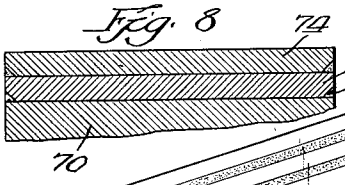


Fig. 7

Fig. 9

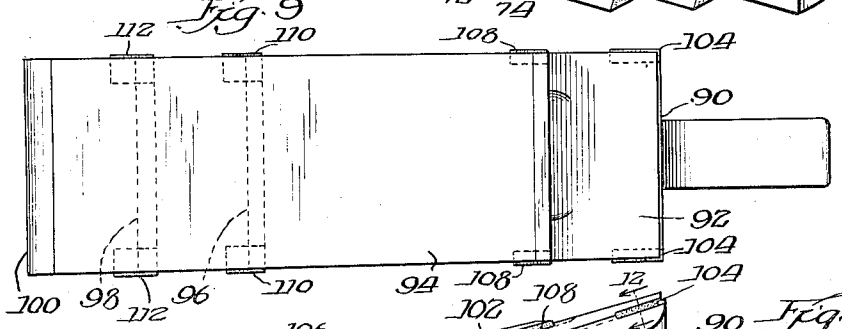


Fig. 10

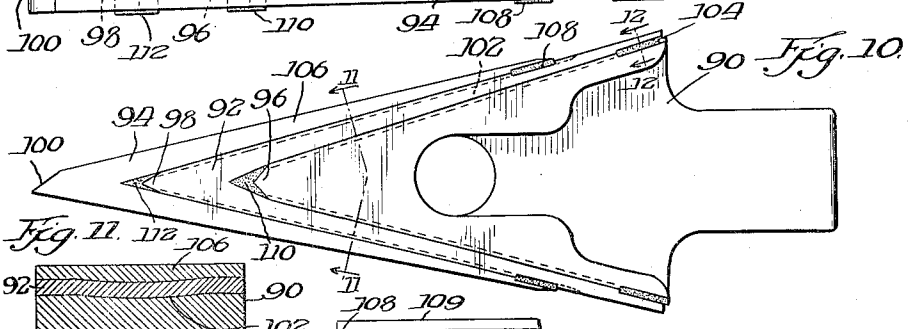


Fig. 11.

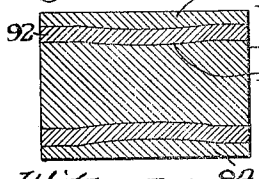
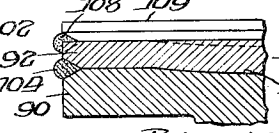


Fig. 12.



Witnesses:
R. B. Davison.

Inventor:
Dwight Graham:
By: Wilkinson Huxley Byron & Knight
Attys

Patented Mar. 3, 1936 2,032,875

UNITED STATES PATENT OFFICE

2,032,875

LAMINATED TOOTH POINT

Dwight Graham, Milwaukee, Wis., assignor to American Manganese Steel Company, Chicago Heights, Ill., a corporation of Maine

Application June 9, 1934, Serial No. 729,736

7 Claims. (Cl. 37—142)

This invention relates to improvements in a laminated dipper tooth point of the reversible and renewable type, mounted upon a tooth base carried on a digging lip of a dipper.

The usual design of a two-part dipper tooth consists of a base and a point, the point being made of a solid one-piece casting. There is a tendency for the initially sharp cutting edge of the tooth point to wear away in service and the cutting edge becomes increasingly blunt as the metal wears away, and, therefore, makes it necessary to discard the whole point. Various designs of tooth points have been proposed in an attempt to overcome this difficulty but they have not been entirely satisfactory.

It is an object of the present invention to provide a dipper tooth point having a series of laminations keyed or welded in place which will provide two or more cutting edges.

It is further an object of my invention to so proportion the laminations of the tooth point that the natural wear on the cutting edge of the tooth will, before the point loses its efficiency due to its becoming blunt, expose a new sharp edge which will have the same digging qualities as the original point.

A still further object of my invention is to enable the application of new laminations on the tooth point so that the original point may be preserved for a considerable period of time.

It is also an object of my invention to provide a tooth point in which the laminations are of comparatively light, uniform section, insuring sound and solid castings with good uniform heat-treatment and, furthermore, on account of the light section and little metal, comparatively high quality alloy metal that may be expensive in price per pound can be used.

Further objects and advantages of my improvements will be more readily apparent from the following description taken in connection with the attached drawings, in which—

Figure 1 is a plan view of my improved tooth point;

Figure 2 is a side elevation partially in section;

Figure 3 is a cross section in the plane indicated by the line 3—3 in Figure 2;

Figure 4 is a cross section in the plane indicated by the line 4—4 in Figure 2;

Figure 5 is a composite figure showing the several parts in separated relation;

Figure 6 is a plan view of a modified form;

Figure 7 is a side elevation of the modified form shown in Figure 6;

Figure 8 is a detail section of a portion of the form shown in Figures 6 and 7;

Figure 9 is a plan view of a further modification;

Figure 10 is a side elevation of the form shown in Figure 9;

Figure 11 is a sectional view on the plane indicated by the line 11—11 in Figure 10, and

Figure 12 is a sectional view on the plane indicated 12—12 in Figure 10.

The dipper tooth, in Figures 1 to 5, inclusive, has a base 10 which may be formed in a conventional manner for attachment to the tooth support upon the digging lip of the dipper. The part 12 constitutes a renewable tooth point which may be mounted on the base 10. The part 14 constitutes an additional renewable point carried by the part 12. The complete dipper tooth may then be described as a laminated tooth point built up by attaching the parts 12 and 14 and additional parts, if so desired, to the base 10. The sharp digging edge 16 of the part 12 is normally concealed by the part 14 which, in turn, has a sharp digging edge 18. The purpose of this construction is to provide a dipper tooth in which, after the sharp digging edge has been impaired by wear, a fresh sharp digging edge may be exposed by merely removing the worn tooth point without immediate replacement thereof. Thus, in the illustrated dipper tooth, after wear of the digging edge 18, the point 14 may be removed to expose the fresh digging edge 16 of the tooth point 12.

The part 10 which constitutes the base includes the divergent wings 20 tied together by the vertical web 22 extending at its rear to form an attaching tang 24 having an opening 26 for a connecting pin or bolt. The wings 20 have inwardly directed flanges 28 which cooperate with the tooth support in the usual manner.

The part 12 includes divergent wings 30 overlying the wings 20 of the base 10. The web 32 between the wings 30 has a wedge pin-receiving opening 34 and a cleft 36 is cut through the web 32 and extends across the opening 34. The nose 38 of the base 10 is bifurcated to receive the web 32 of the part 12 and the bifurcated nose 38 is formed with wedge pin-receiving openings 40. The end 42 of the nose 38 may be somewhat reduced in width to extend between the side webs 44 between the wings 30 of the part 12. The webs 44 may also have clefts or slits 46 to provide for a tight seat of the part 12 upon the base 10. In order to hold the wings 30 against spreading the central web 32 is extended to provide

rearwardly directed lugs 48 and the base 10 is provided wtih grooves extending from the bifurcation of the nose and terminating in undercut portions 50 which receive the lugs 48. Thus, the wings 20 provide shoulders 52 engaging the lugs 48 to hold the wings 30 of part 12 against spreading. The part 12 may be positioned on the base 10 and held in position by the insertion of the wedge pin 54 through the cooperating openings 40 and 34. The exterior part 14 includes divergent wings 56 overlapping the wings 30 of part 12, fastened thereto by pins or rivets 58. Ribs 60 are provided on the inner side of the wings 56 which fit into grooves 62 formed in the wings 30 and the ribs 60 terminate in lugs 64 received beneath the shoulders 66 of the wings 30. In the form thus far described, each of the overlying wings 30 and 56 extends at least far enough to protect from wear that portion of the inclined surface beneath it which carries wing-interlocking means typified by the part 48—50 or 64—66.

It will be understood that the parts 12 and 14 are secured together by pins or rivets 58 before being assembled upon the base 10. In use the outer part 14, as it becomes worn, automatically breaks away and exposes a new sharp edge.

Instead of pinning together the laminations of the tooth point, it may be desirable to weld the laminations together and Figures 6 to 8 show a welded laminated tooth point. The base 70 may have applied thereto a plurality of V-shaped laminations 72, 74, etc. The edges of the V-shaped lamination 72 may be chamfered, as indicated at 76, to provide a V-shaped groove in which the welding material 78 may be deposited to securely attach the lamination 72 to the tooth body 70. In a similar manner the laminated portion 74 may be welded as at 80. This laminated dipper tooth provides successive digging edges 82, 84, 86.

Figures 9 to 12 illustrate a further modification of a laminated dipper tooth in which the several laminations are welded in place. The tooth body 90 has mounted thereon an inner V-shaped point 92 and an outer V-shaped point 94. The base 90 has a digging edge 96, the inner point 92 has a digging edge 98, and the outer point 94 has a digging edge 100. The wings 102 of the point 92 are tapered and at their rear ends are welded as at 104 to the base 90. The wings 106 of the point 94 also taper rearwardly and are welded at their rear ends as at 108 to the point 92. Additional welding material is deposited at 110 in recesses cut out at the junction between the wings 102 of the point 92 and the point 94 is similarly welded to the point 92 by weld 112. In order to hold the parts against separation, due to lateral strains upon the tooth, the wings 102 may be formed to fit longitudinally into grooves formed in the body 90 and the wings 106 are similarly formed to fit into grooves in the wings 102, as shown by the sectional view of Figures 11 and 12.

Various modifications and improvements may be resorted to without departing from the spirit of the invention as expressed in the appended claims, in which the reference to dipper tooth is intended to include tooth or teeth dippers, scarifiers, drag buckets, grader blades and the like, since my improvements are applicable to all such forms of scraping or digging implements.

I claim:

1. A laminated excavating implement tooth, comprising an inner member constructed with a forward penetrating edge and rearwardly divergent digging surfaces, and an outer auxiliary member constructed with a forward penetrating edge and rearwardly divergent wings providing digging surfaces similar to those of said inner member; said wings overlying, separably secured upon and approximately corresponding in width and length with the divergent digging surfaces of the inner member; and said auxiliary member thereby initially protecting the penetrating edge and said digging surfaces of said inner member and, when worn and discarded, exposing the penetrating edge and digging surfaces of the inner member for use.

2. A tooth for excavating implements as described in claim 1, in which meeting surfaces of the outer and inner members are provided, one with a reentrant portion and the other with a projecting portion separably interlocking with the reentrant portion and resisting relative movement in a direction lateral to the digging tooth.

3. A tooth for excavating implements as described in claim 1, in which the outer and inner members are provided with cooperating parts projecting one into the other and separably interlocking the said members from relative movement in a direction perpendicular to the plane in which they meet.

4. A tooth for excavating implements as described in claim 1, in which the rearwardly extending surfaces of the outer and inner members are provided by wings on said members, and said wings are constructed with interlocking portions separably securing said outer and inner members, through their said wings, against relative displacement; an outer wing overlying and protecting from wear the interlocking portion of an inner wing.

5. A tooth for excavating implements as described in claim 1, in which the outer and inner members are constructed with overlying wings, and said wings are provided with projecting and reentrant portions cooperating to secure the members against relative lateral displacement, and with interlocking means separably connecting said wings against relative movement in a direction perpendicular to the general plane of meeting of said wings.

6. A dipper tooth comprising a tooth base, a replaceable tooth point having wings and carried by said base, interlocking connections between the wings of said tooth point and said base to hold the wings of said point against spreading, an additional tooth point having wings and carried by said first tooth point and interlocking connections between the wings of said tooth points to hold the wings of said second tooth point against spreading.

7. A dipper tooth comprising a tooth body having divergent wings, a V-shaped tooth point carried by said base, a wedge pin for holding said tooth point to said base, a second V-shaped tooth point carried by said first tooth point and means for holding said second tooth point upon said first tooth point.

DWIGHT GRAHAM.