E. L. PEMBERTON.

TOOTH FOR DIPPERS OF EXCAVATING MACHINES.

APPLICATION FILED JUNE 26, 1914.

1,188,480.

Patented June 27, 1916.

2 SHEETS—SHEET 1.

Fig. 1.

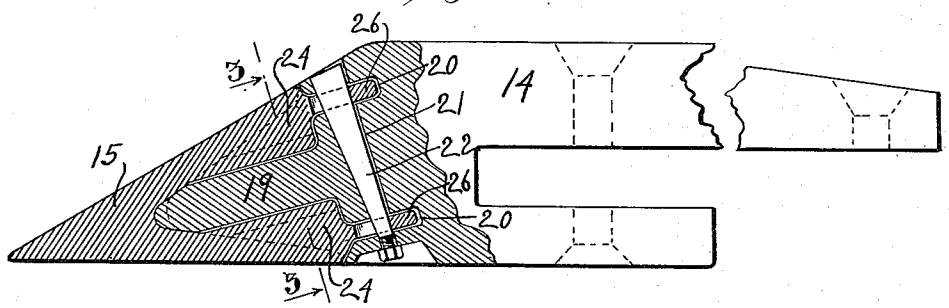


Fig. 2.

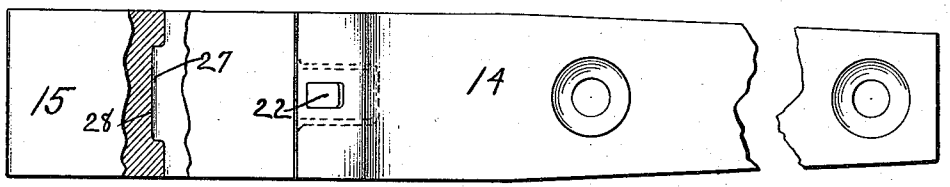


Fig. 4.

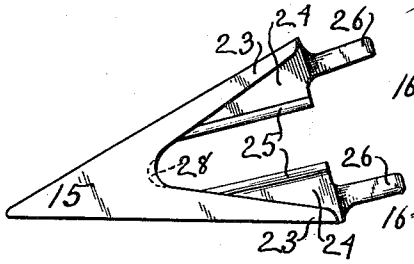


Fig. 3.

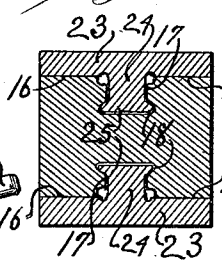
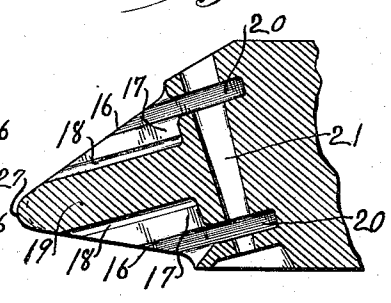


Fig. 5.



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2 SHEETS—SHEET 2.

Fig. 6.

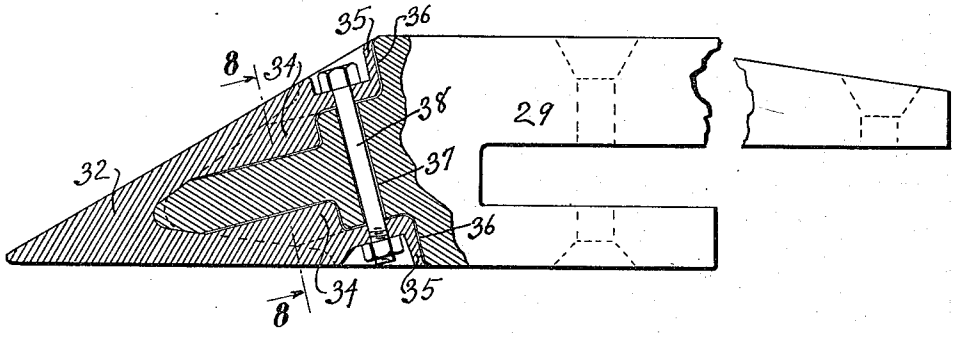


Fig. 7.

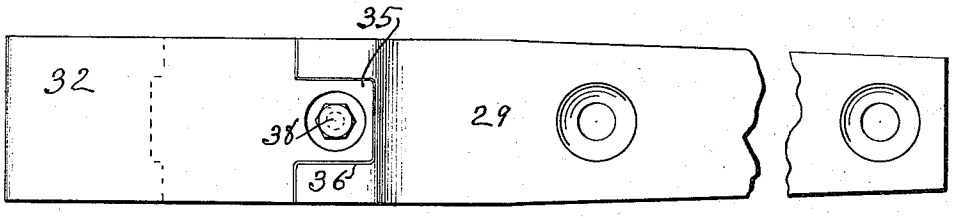


Fig. 8.

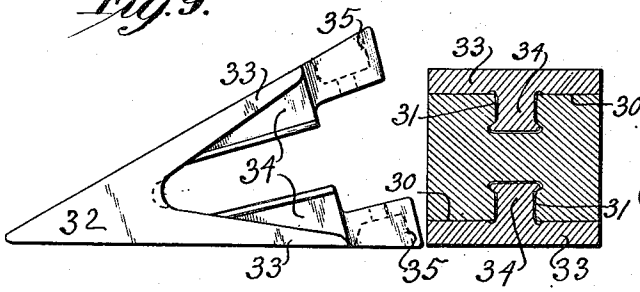
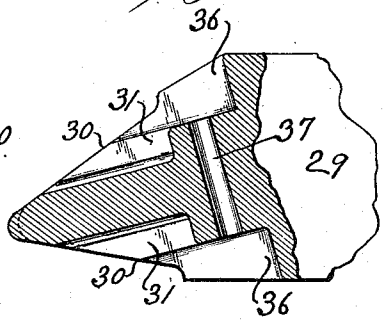


Fig. 9.

Fig. 10.



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UNITED STATES PATENT OFFICE.

EDWARD L. PEMBERTON, OF NEW HAVEN, CONNECTICUT, ASSIGNOR TO AMERICAN MANGANESE STEEL COMPANY, OF AUGUSTA, MAINE, A CORPORATION OF MAINE.

TOOTH FOR DIPPERS OF EXCAVATING-MACHINES.

1,188,480. Specification of Letters Patent. Patented June 27, 1916.

Application filed June 26, 1914. Serial No. 847,451.

To all whom it may concern:

Be it known that I, EDWARD L. PEMBERTON, a citizen of the United States, and a resident of New Haven, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Teeth for Dippers of Excavating-Machines, of which the following is a specification.

My invention relates to teeth for dippers for excavating, dredging, digging and similar machines, and particularly to dipper teeth which are made up of or which comprise a supporting base or shank, together with a detachable and renewable point secured to and supported by said base; so that when the point becomes worn in use to such an extent as to be no longer serviceable it may be removed and a new point substituted therefor, thus avoiding the necessity of renewing the supporting base, which forms the greater portion of the tooth, each time the tooth becomes too dull or too much worn for effective use, as would be the case if the point and base were formed integral with one another.

In dipper teeth having a separable and renewable point the point has to be very securely supported upon and secured to the shank or base of the tooth, as the greater part of the strain due to digging comes upon and is concentrated at the point of the tooth; and the principal object of my invention is to provide a dipper tooth in which an exceedingly strong connection is secured between the base and point due to an interlocking joint provided between said parts by my invention, while at the same time the arms of the point are prevented from spreading and a construction is provided such that the point may be readily removed from the base and a new one substituted therefor. A further object is to provide a tooth point having dove-tailed lugs projecting longitudinally along the under surface of the spreading jaw thereof, which are adapted to interlock with dove-tailed recesses projecting along the inclined faces of the nose of the base, thus holding and bracing throughout their entire length the diverging jaws of the point against spreading, and rendering unnecessary the usual type of web between the jaws of the point, and also eliminating the necessity of bifurcating and therefore weakening the nose of the base.

A further object of my invention is to provide a construction of point and base which may be readily and easily made from cast metal, the point being commonly made from cast manganese steel and the base or shank of the same, or, as is usually the case, of a cheaper material.

With the above and other objects of invention in view, my invention consists in the improved dipper tooth, detachable point, and base illustrated in the accompanying drawings and hereinafter described and claimed, and in such variations and modifications thereof as will be obvious to those skilled in the art to which my invention relates.

In the drawings wherein the preferred embodiment of my invention is illustrated, and wherein the same reference numerals are employed to designate the same parts or features of construction in the several views, Figure 1 is a view partly in section and partly in side elevation showing my improved dipper tooth; Fig. 2 is a view showing the same in plan, a portion of the point being broken away to show features of construction hidden by it; Fig. 3 is a view showing a section upon a transverse plane indicated by the line 3, 3, Fig. 1; Fig. 4 is a view showing the detachable point of my improved dipper tooth in side elevation. Fig. 5 is a view showing the forward or outer free end of the supporting base or shank of the tooth in section; Fig. 6 is a view corresponding to Fig. 1 but showing a different form of my improved dipper tooth; Fig. 7 is a view showing the same in plan; Fig. 8 is a view showing a section upon a transverse plane indicated by the line 8, 8, Fig. 6; Fig. 9 is a view showing the detachable point shown in Fig. 6 in side elevation; and Fig. 10 is a view showing the free end of the supporting base shown in Fig. 6 in section.

Referring first to Figs. 1 to 5 inclusive, the reference numeral 14, designates the supporting base or shank portion of my improved dipper tooth, the same being designed to be secured to the front portion of a dipper body and to the free outer end of which the detachable or removable point portion 15 of the tooth is secured, said outer end being tapered to thereby provide two oppositely located inclined seats 16. The tapered outer portion of the base is provided

with two recesses 17 located in and extending longitudinally of the seats 16, and which recesses are undercut as shown at 18, the bottoms of the recesses being thus wider than the tops or outer portions; and the bottom walls of these recesses are parallel or substantially parallel with one another as best shown in Fig. 5, the recesses being thus separated from one another by an intervening web 19. The base 14 is also provided with two other recesses 20 located adjacent the rear ends of the undercut recesses 17 and designed to receive two perforated securing lugs of the detachable or removable point of the tooth, and provided also with a transverse passage 21 intersecting said recesses and adapted to receive a key 22 for holding the removable point in place upon the tapered outer end of the base, as best shown in Fig. 1. The detachable point 15 of my improved dipper tooth is bifurcated to thereby provide two oppositely located diverging arms 23 which arms are obviously inclined with reference to one another and overlie the inclined seats 16 of the base when the point is secured thereto; and 24 designates two lugs located one upon the inner side of each of said arms, and which lugs project from the arms and part way only across the space between the same, so as to leave room between them for the web 19, as best shown in Fig. 4. The arms 23 may also be appropriately referred to as rearwardly diverging jaws, and the lugs 24 as located or provided upon the inner confronting faces of said jaws or arms; and said lugs may also be described as elongated because of the fact that they extend longitudinally of or along the inner or confronting faces of the jaws or arms, as will be appreciated. The lugs above referred to are undercut and are widest at their free ends 25, and they correspond in cross-section with the cross-section of the recesses 17 within which they lie when the point and base are assembled, whereby the lugs in question interlock with the side walls of the recesses and an interlocking or dovetailed joint is provided between the point and base, as best shown in Fig. 3. This interlocking connection between the point and base is obviously dependent upon the similarity in cross-section of the lugs 24 and the recesses 17 in the base, which cross-section is substantially dove-tail in shape, and is independent of the length of the lugs longitudinally of the point, although I prefer to make the lugs of such a length that they substantially fill the recesses when the point is in place, and the bottom walls of the recesses 17 being parallel, as above pointed out, it follows that the inner adjacent free ends 25 of the lugs 24 are parallel or substantially parallel with one another, as best shown in Fig. 4. The detachable point 15 is also provided with two perforated securing lugs 26 located one at the free end of each of the arms 23 and which lugs enter and lie within the recesses 20 hereinbefore referred to when the parts are assembled, the point being held in place upon the outer end of the base by the securing key 22 which extends through openings provided in the lugs 26 as best shown in Fig. 1.

In the embodiment of my invention illustrated the lug 26 is widened in order to provide sufficient stock around the opening for the key 22, and the recess 20 which receives the lug is obviously as wide as the lug 26, and is in fact somewhat wider than the shank or neck of the lug 24 above the enlarged head 25. The recess in question runs into the inclined faces or seats 16 of the tapered outer end of the base 14, so that the point may be moved longitudinally of the base, or rather of its tapered outer end, in removing and replacing the point, as will be understood. The plane upon which Fig. 3 is taken is so located that it intersects the outer ends of the recesses 20, and they therefore show in Fig. 3 as indicated on said figure; and that figure also shows small curved grooves in the corners where the lugs 24 merge with the inclined arms 23 of the tooth point, such grooves being common in dipper tooth construction and the purpose of which is to avoid sharp corners in the point castings, and to prevent dirt from getting caught in the corners between the lugs and arms as the point is placed upon the base and thus possibly preventing the point from properly seating itself upon the tapered outer end thereof.

The extremity of the base 14 is preferably provided with a central lug 27 which extends into a recess 28 provided for it in the detachable point to thereby prevent sidewise movement of the point, as will be understood.

In the form of my invention shown in the Figs. 6 to 10 the supporting base 29 is tapered to provide inclined seats 30 having undercut recesses 31, and the detachable point 32 is bifurcated to provide diverging arms 33 having undercut lugs 34 upon their inner surfaces which lie within the recesses 31 and provide an interlocking connection between the base and point when the parts are assembled, all in substantially the same manner as in the form of my invention first above described. In lieu, however, of the securing lugs 26 adapted to enter recesses 20 located within the body of the base, as in the form first described, I provide securing lugs 35 the outer surfaces of which lie substantially in the inclined planes which form the upper and lower sides of the diverging arms of the point, which lugs, however, are located at the free ends of the arms as in the form first referred to. These securing lugs enter recesses 36 provided for them in

the base 29, which recesses, being open at their outer sides, or open recesses, are less difficult to provide than the corresponding internal recesses 20 of the form of my invention first described. A passage 37 is formed in the base 29, and a securing member 38 extends through holes provided in the lugs 35 and through said passage to thereby hold the detachable point in place upon the base as will be understood from Fig. 6.

In both the forms of my invention illustrated it will be appreciated that the diverging sides or arms of the detachable point are prevented from spreading when the tooth is in use because of the interlocking connection or joint provided between the arms and the tapered portion of the base upon which the point is supported, while the point is held in place upon the base by the securing lugs and transverse fastening member extending through the passage in the base. In connection with the foregoing, it is to be understood that the lugs, in addition to holding the arms against spreading, also brace the point against transverse shifting, and, furthermore, that the lugs are located between, and accordingly protected by the arms of the point. The point is put in place or removed by moving it longitudinally of the tapered end of the base, and, while I have shown my invention as embodied in a tooth in which both the tapered point supporting end of the base, and the detachable point, are symmetrical, so that the point may if desired be removed and its position reversed upon the base after it has become worn on one side, my invention is nevertheless equally applicable to and capable of use in dipper teeth having a detachable point but in which the point and base are not so shaped as to permit the point to be reversed.

The provision of dove-tailed lugs extending longitudinally of the arms of the point, and their securement to corresponding recesses formed along the inclined faces of the nose of the base, is broadly new with me, and I do not limit myself to its application to the type of tooth disclosed in the drawings, as it is clearly apparent that this construction may be incorporated in various types of dipper teeth where it is desired to brace the arms of the point against spreading, without the employment of a web between the arms of the point and without requiring the bifurcation of the nose of the base.

Having thus described and explained my invention, I claim and desire to secure by Letters Patent:

1. A removable point for a dipper tooth comprising rearwardly diverging jaws, said jaws being provided upon their inner confronting faces with longitudinally extending elongated lugs, the lug upon the upper of said jaws being substantially dove-tail in cross-section.

2. A detachable point for a dipper tooth having two oppositely located rearwardly diverging arms, and spaced or separated lugs located upon the confronting surfaces of said arms and substantially dove-tail or undercut in cross-section, the spacing between said lugs defining an opening therebetween for the reception of the nose of a tooth base.

3. A supporting base for a dipper tooth having a tapered outer end, defining oppositely inclined seats, said seats provided with recesses extending longitudinally thereof, said recesses being substantially dove-tail shape or undercut in cross-section.

4. A dipper tooth comprising a supporting base, with a tapered outer end defining oppositely inclined seats, a detachable point having two rearwardly diverging arms; and interlocking undercut lugs and recesses carried by and extending longitudinally of said arms and seats, holding said arms against spreading.

5. A supporting base for a dipper tooth having a tapered outer end, defining oppositely inclined seats, said seats provided with recesses therein undercut in cross section.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EDWARD L. PEMBERTON.

Witnesses:
H. L. CADMUS,
R. N. FLINT.