

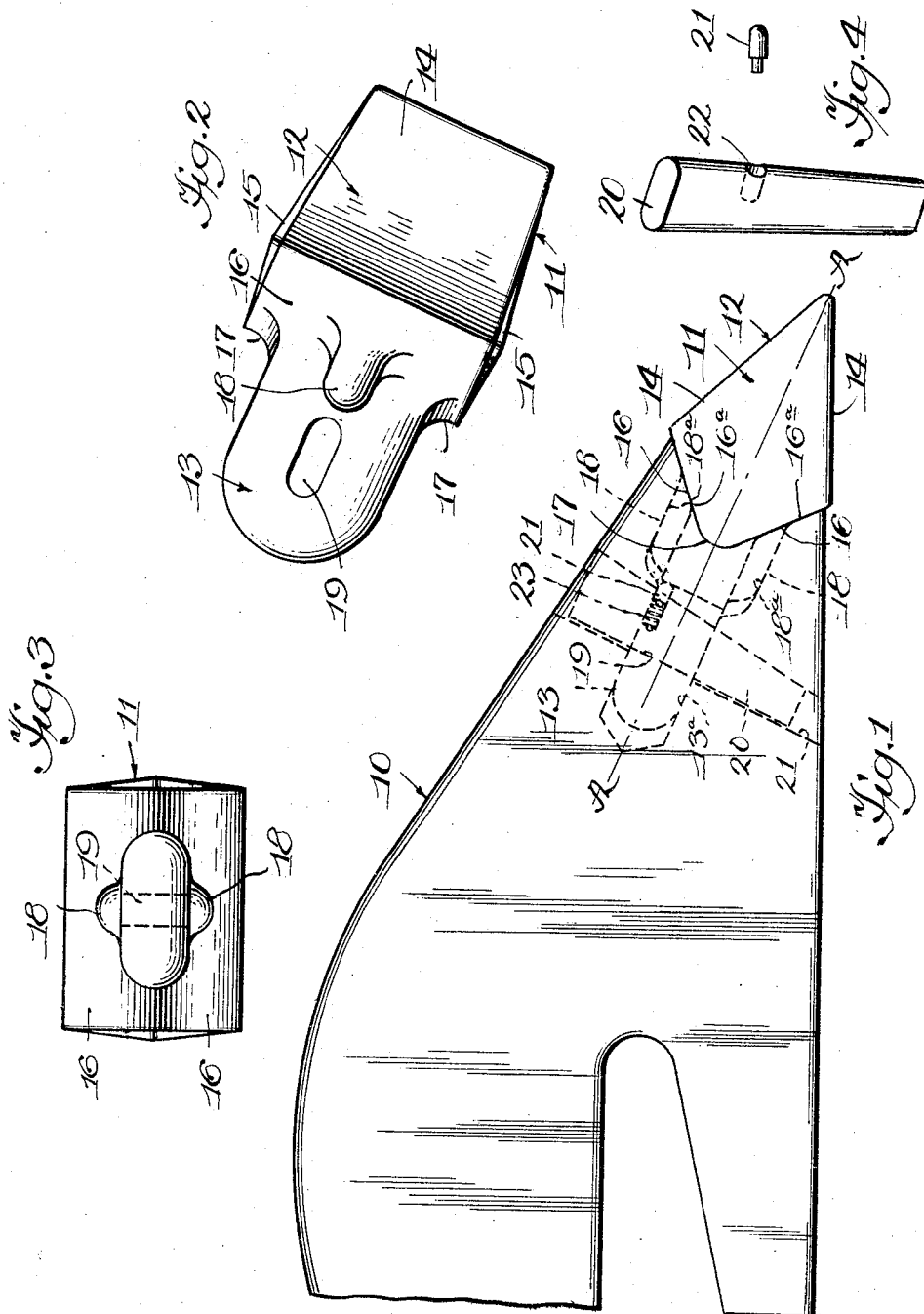
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FORGED DIPPER TOOTH

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UNITED STATES PATENT OFFICE

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FORGED DIPPER TOOTH

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This invention relates to improvements in dipper teeth of the detachable and renewable type, and has for its principal object to provide a simple and improved form of tooth and base that can be made by the forging process with a minimum amount of machining.

As heretofore manufactured, renewable dipper teeth have usually been made of castings, in which the detachable point and its base have been provided with interlocking joint structures that are necessarily more or less complicated, in order to afford the desired rigidity and strength, coupled with ready detachability. Furthermore, the dipper teeth themselves are preferably made of abrasion-resisting alloys which are comparatively difficult to machine, so that castings include, so far as practicable, the interlocking joint structure, thereby avoiding as much machining as possible. Consequently, practically all forms of cast dipper teeth now in commercial use are of such comparatively complicated designs that they would not be commercially practicable if made by other manufacturing processes such as forging.

In carrying out my invention, I provide a novel and simple construction of dipper tooth and base especially designed for manufacture by forging, and requiring a minimum amount of machining. When so constructed, my improved form of tooth is more economical in manufacture and use and is less subject to breakage than teeth now on the market.

The invention may best be understood by reference to the accompanying drawing, in which

Figure 1 is a fragmentary side view of a dipper tooth and base assembly, constructed in accordance with my invention.

Figure 2 is a top plan view of the tooth removed from the base.

Figure 3 is a rear view of the tooth shown in Figure 2.

Figure 4 is a detail view of the wedge pin showing its locking pin removed therefrom.

Referring to details of the embodiment of my invention shown in the drawing, 10 indicates the projecting portion of a tooth base

which is secured to the dipper (not shown) in the usual manner. The detachable tooth is indicated generally at 11, and comprises a head 12 and a shank 13. The head 12 is formed with two plane upper and lower faces 14, 14 converging forwardly to the point of the tooth, and two side faces 15, 15.

The head 12 also has two rearwardly converging plane faces 16, 16 which meet the rearward edges of the forwardly converging faces 14 at an obtuse angle, and merge into the shank 13 at the center, and along the rounded edges 17, 17 extending laterally from opposite sides of the shank.

A pair of interlocking ribs 18, 18 are formed as elevations along the top and bottom of the shank 13 and merging into each rear face 16, said ribs extending longitudinally and centrally of the major axis and being generally arcuate or semi-circular in cross-section as is best indicated in Figure 3.

The shank 13 extends rearwardly from the head 12, and is substantially wider in a direction extending transversely of the tooth, than in a vertical direction. The sides of said shank are preferably semi-circular in cross section, as seen in Figure 3. A suitable aperture 19 extends through the rear end of said shank for engagement by a wedge pin 20, as shown in Figure 1. In the form shown, the aperture is elongated in the direction of the major axis of the shank.

Referring now generally to the formation of the tooth, it will be observed that the several parts are arranged symmetrically with respect to the median plane of the tooth including its major axis and the meeting edges of the front faces 14, 14, as indicated by line A—A in Figure 1, so that the tooth is fully reversible and can be formed with identical upper and lower forging dies. The front and rear converging faces 14 and 16, respectively, are both inclined at an obtuse angle to the median plane of the tooth, and meet each other at obtuse angles so as to make an especially solid, compact and simple forging. The shank 13 and its ribs 18 have their opposite sides tapered or curved inwardly from the central plane, so that all of said parts can be readily forged to final shape during the

forging operation. The only machining necessary for finishing the entire tooth is that of trimming the flash and forming the wedge pin aperture 19 in the shank.

5 The base 10 is provided with corresponding interlocking surfaces for receiving the tooth, including a socket 13^a to receive the shank 13, inwardly converging walls 16^a, 16^a to receive the rear walls 16, 16 in seated en-
10 gagement, and grooves 18^a, 18^a in which the ribs 18, 18 have close fitting engagement, to resist rotational twisting of the tooth in its base. These surfaces may be readily machined in the base, as by milling or shaping.
15 The socket 13^a is especially designed to be finished by end milling said socket with its arcuate side walls and grooves 18^a.

The tooth is held in place by the wedge pin 20 passing through a tapered aperture 21 formed in the base 10 and registering with the aperture 19 in the shank 13 when the tooth and base are in assembled position as shown in Figure 1.

In order to hold the wedge pin in place, I
25 provide a locking pin 21 seated in a bore 22 formed in the front face of the pin, as is best shown in detail in Figure 4. Said pin is normally urged forwardly by a compression spring 23 seated against the bottom of the bore
30 22 (see Fig. 1). The arrangement is such that the locking pin may be pushed inwardly while the wedge pin is being inserted, but when the latter reaches its seated position, the locking pin registers with an open portion of the aper-
35 ture 19 in shank 13, and is automatically sprung outwardly into locking position beneath the adjacent side wall of the socket 13^a, thus securely holding said wedge pin in place. In the event the wedge pin is to be removed,
40 the latter may be knocked out under sufficient force to shear the locking pin.

It will be observed that the tooth 11 is fully reversible with regard to its seat on the base, that is to say, it can be fitted and used either
45 in the position shown in Figure 1, or inverted from said position. When made of forged metal as described, there is much less likelihood of breakage, than with more or less brittle castings.

50 Although I have illustrated and described one particular embodiment of my invention, it will be understood that I do not wish to be limited to the exact construction shown and described, but that various changes and modifi-
55 cations may be made without departing from the spirit and scope of my invention.

I claim:

1. A dipper tooth including a base and a removable tooth, said tooth consisting of a
60 head and a rearwardly projecting shank, said head having upper and lower forward faces converging to form the point of said tooth, and rearwardly inclined faces merging into said shank at an obtuse angle to the major
65 axis of said tooth, a pair of ribs extending

longitudinally of said shank and merging into the rearward faces of said tooth, said base having a socket including co-operating surfaces for receiving said shank, ribs and the rear faces of said tooth in close fitting
70 engagement, and a pin adapted to extend through said base and said shank for securing said dipper tooth to said base.

2. A dipper tooth including a base and a removable tooth, said tooth having its parts
75 disposed symmetrically on opposite sides of its median plane, and consisting of a head and a rearwardly projecting shank, said head having upper and lower forward faces converging at an acute angle to form the point of said tooth, and rearwardly inclined
80 faces merging into said shank at an obtuse angle to said median plane, and a pair of ribs extending longitudinally of said shank and merging into the rearward faces of said tooth, said base having a socket including co-
85 operating surfaces for receiving said shank, ribs and the rear faces of said tooth in close fitting engagement in invertible positions therein, and a pin adapted to extend through said base and said shank for securing said
90 dipper tooth to said base in either of said invertible positions.

3. A dipper tooth including a base and a removable tooth, said tooth consisting of a
95 head and rearwardly projecting shank, said base having a socket including co-operating surfaces for receiving said shank and the rear faces of said tooth in close fitting engagement, a taper pin adapted to fit into said base and extend through the rear end of said
100 shank, and a spring pressed locking pin carried by said taper pin and arranged to register within said socket to restrain removal of said taper pin when the latter is in fully
105 seated position within said base.

4. A removable dipper tooth, which consists of a head and rearwardly projecting
110 shank, said head having forward top and bottom faces converging to form the point of said tooth, rearwardly inclined plane faces converging along their outer margins with said front faces, and merging into said shank at an obtuse angle to the major axis of the
115 latter, a pair of ribs extending longitudinally at the top and bottom of said shank and merging into said rearward faces of the head, said shank having an aperture adjacent its rearward end for receiving a securing pin.

5. A removable dipper tooth, which consists of a head and rearwardly projecting
120 shank, said head having forward top and bottom faces converging to form the point of said tooth, rearwardly inclined plane faces converging along their outer margins with said front faces, and merging into said shank at an obtuse angle to the major axis of the
125 latter, a pair of ribs extending longitudinally and centrally at the top and bottom of said shank and merging into said rearward faces
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of the head, said shank having an aperture adjacent its rearward end for receiving a securing pin.

5 6. A removable dipper tooth, which consists of a head and rearwardly projecting shank, said head having forward top and bottom faces converging to form the point of said tooth, rearwardly inclined plane faces converging along their outer margins with
10 said front faces, and merging into said shank at an obtuse angle to the major axis of the latter, a pair of ribs extending longitudinally at the top and bottom of said shank and merging into said rearward faces of the head,
15 said shank being widened in the direction of the meeting edges of said rearward faces of the head, and having an aperture adjacent its rearward end for receiving a securing pin.

20 7. A removable and invertible dipper tooth, which consists of a head and a rearwardly projecting shank, both having similar parts symmetrically formed about the median plane of said tooth, said head having upper and lower forward faces converging to form
25 the point of the tooth, and rearwardly inclined faces merging into said shank at an obtuse angle to said median plane, and ribs formed at the meeting angles of and merging into said rear faces and shank, said shank
30 having an aperture adjacent its rearward end for receiving a securing pin.

8. A dipper tooth comprising a base, and a removable and invertible dipper tooth, which consists of a head and a rearwardly
35 projecting shank, both having similar parts symmetrically formed about the median plane of said tooth, said head having upper and lower forward faces converging to form the point of the tooth, and rearwardly inclined faces merging into said shank at an
40 obtuse angle to said median plane, and ribs formed at the meeting angles of and merging into said rear faces and shank, said shank having an aperture adjacent its rearward end
45 for receiving a securing pin, and a base having a socket including co-operating surfaces for receiving said shank, ribs, and the rear faces of said tooth in close fitting engagement in invertible positions therein, said base
50 also having an aperture extending transversely of said socket for mounting said securing pin in registering and locking position relative to said shank.

55 9. A dipper tooth including a base and a removable tooth, said tooth consisting of a head and an integral projecting shank, said head having upper and lower forward faces converging to form the point of said tooth, and rearwardly inclined upper and lower
60 faces extending substantially the full width of said tooth and disposed at an obtuse angle to the major axis of said tooth, said upper and lower rear faces merging into said shank, and meeting each other in a V-shaped angle
65 at opposite sides of said shank, said base hav-

ing a socket including co-operating surfaces for receiving said shank and the rear faces of said head in close fitting engagement, and a pin adapted to extend through said base and engaging said shank for securing said tooth to said base.

Signed at Chicago, Illinois, this 17th day of May, 1932.

FRED FINKL.

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