

May 12, 1936.

M. L. FYKSE ET AL

2,040,085

DIPPER TOOTH

Filed March 23, 1934

3 Sheets-Sheet 1

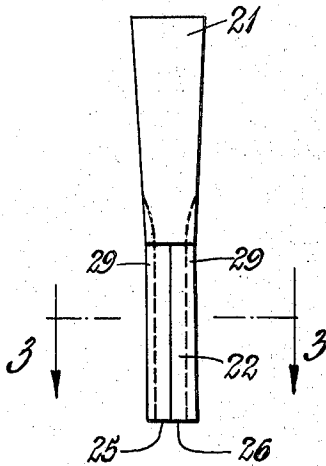


Fig. 1.

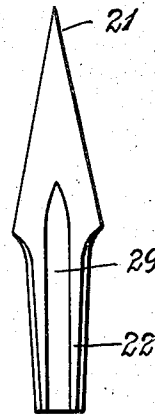


Fig. 2.

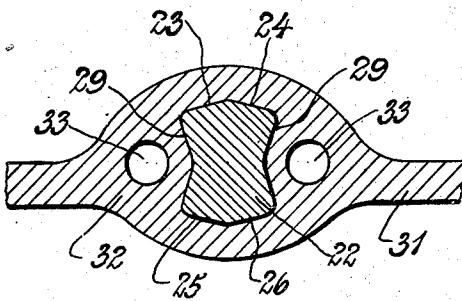


Fig. 3.

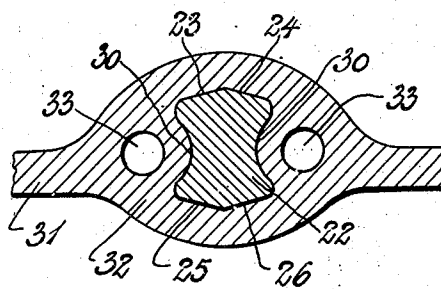


Fig. 4.

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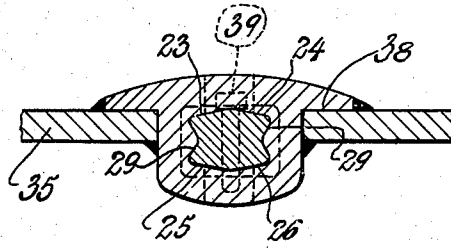


Fig. 7.

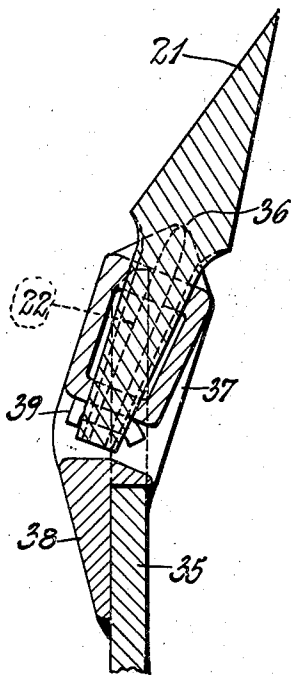


Fig. 6.

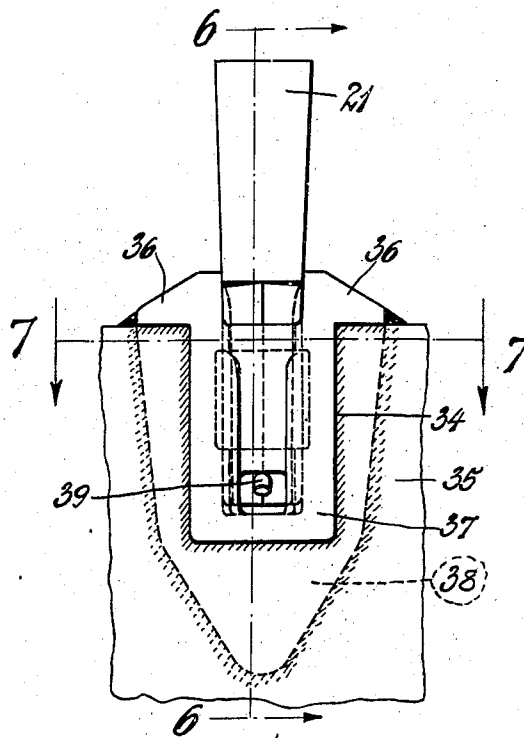


Fig. 5.

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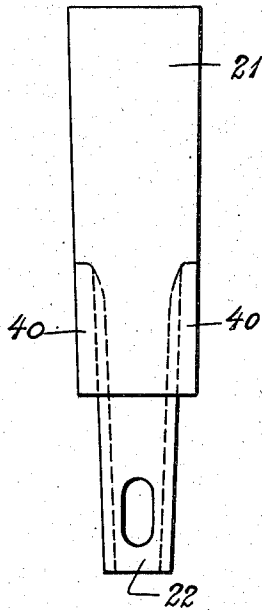


Fig. 8.

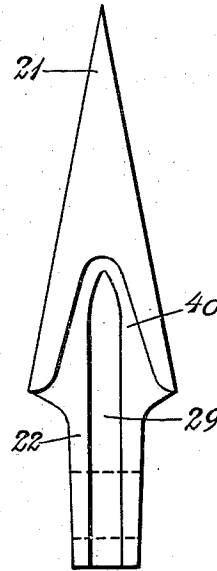


Fig. 9.

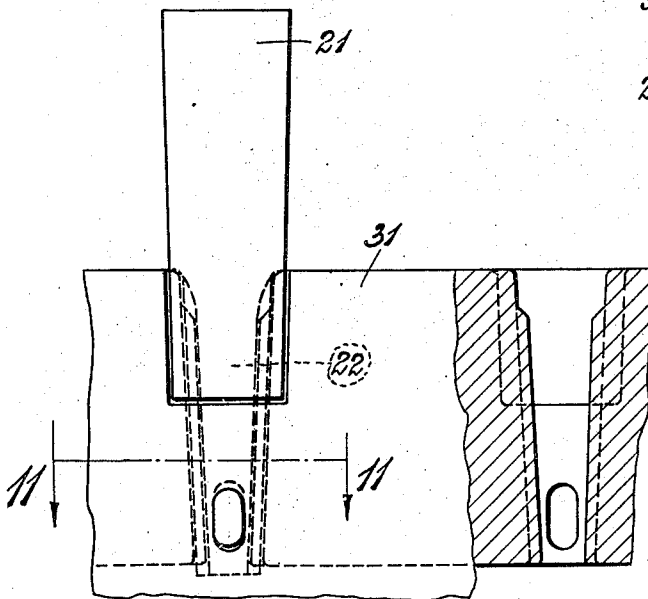


Fig. 10.

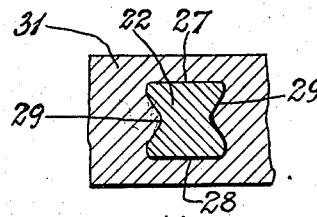


Fig. 11.

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UNITED STATES PATENT OFFICE

2,040,085

DIPPER TOOTH

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Application March 23, 1934, Serial No. 717,002

5 Claims. (Cl. 37—142)

Our invention relates to new and useful improvements in dipper teeth.

Socket type teeth are old in the art, but it has been found by us that square teeth do not fit as snugly as hexagonal teeth; and yet, when we tried hexagonal teeth, there was found to be a tendency to wear and rotate. This tendency was even present to some extent in square teeth.

Ordinary square or polygonal teeth and their sockets, unless carefully machined (which is an unduly expensive expedient), have been found to wear into a round or partially round shape, and thus to afford no stable support against rotation of the tooth. A reentrant side resists this danger in two ways. In the first place, such a tooth cannot wear round and, in the second place, the faces of a reentrant side present themselves at almost right angles to the turning moment, whereas the faces of a square tooth present only 45°, and a polygonal tooth even less.

Accordingly it is the principal object of the present invention to provide teeth and sockets having reentrant sides.

Furthermore, we have found that, by undercutting the point of a socket tooth, and thereby providing a pocket for the insertion of a part of the dipper lip, we provide both a further preventive of rotation, and also a longer lever arm against the digging stress.

Accordingly it is a further object of our invention to attain these last-named advantages.

A still further object of our invention is to provide a novel socket-construction.

In addition to our principal objects, above stated, we have worked out a number of novel and useful details, which will be readily evident as the description progresses.

Our invention consists in the novel parts, and in the combinations and arrangements thereof, which are defined in the appended claims; and of which several embodiments are exemplified in the accompanying drawings, which are herein-after particularly described and explained.

Throughout the description, the same reference number is applied to the same member or to similar members.

Figure 1 is an elevation of one form of our tooth.

Figure 2 is a side elevation of the same tooth, as seen from either side in Figure 1.

Figure 3 is a cross section of the same tooth, together with its socket, taken along the line 3—3 in Figure 1.

Figure 4 is the same cross section of a slight

variant of the cross sectional shape of the same tooth.

Figure 5 is an elevation of one form of our tooth in position in a special form of socket.

Figure 6 is a vertical section of the same tooth and socket, taken along the line 6—6 of Figure 5.

Figure 7 is a cross section of the same tooth and socket, taken along the line 7—7 in Figure 5.

Figure 8 is an elevation of another form of our tooth.

Figure 9 is a side elevation of the same tooth, as seen from either side in Figure 8.

Figure 10 is a dipper lip partly in elevation and partly in section, showing the tooth of Figure 8 in position.

Figure 11 is a cross section of the tooth and lip of Figure 10, taken along the line 11—11 in that figure.

Referring to the drawings, it will be seen that each tooth portrayed has a wedge-shaped point 21 and a shank 22.

The point 21 has four sides, two of which converge to a cutting edge, and the other two of which are parallel or may diverge slightly. These latter two sides will be referred to in the claims as the "non-converging sides".

In some forms of our tooth (see Figures 3, 4, and 7), the shank 22 has two sets of faces (23, 24 and 25, 26), characterized by the fact that the two sets are disposed opposite to each other, and that the two faces of each set are disposed at an obtuse angle to each other.

In other forms of our tooth (see Figure 11), the shank has two opposed parallel faces 27, 28.

In both forms the remaining two faces of the shank are reentrant, preferably either in the form of a slightly rounded angle as at 29 in Figures 3, 7, and 11, or in the form of a curve as at 30 in Figure 4.

The lip 31 of the dipper may be uniformly wide as in Figure 11, or may be widened as at 32 in Figures 3 and 4, to form sockets for the teeth. In the latter case it would be well to relieve the casting of too much thickness, with the possibility of resulting blow-holes, by providing core-holes 33.

A third lip variant is shown in Figures 5, 6, and 7. A notch 34, preferably rectangular, is cut in the digging edge of the dipper front 35, which thus may be made of structural plate material. Each socket is cast separately with a lip portion 36, and a principal body portion 37, to project into the notch 34. This body portion is preferably inclined at the proper digging angle, as shown in Figure 6.

An apron 38 fits against one face of the dipper

front 35, and is secured thereto, preferably by welding or brazing. In view of the fact that digging imparts a clockwise impact to the tooth as shown in Figure 6, this apron 38 is preferably disposed on the inside of the dipper front, as shown in that figure.

In the body portion 37 there is a socket for the insertion of the shank 22 of the tooth, which may be driven therein and/or secured by a pin 39.

10 In the variant shown in Figures 8 to 11, the point 21 of the tooth is made somewhat wider than the shank 22, and the lip 31 fits into recesses 40 in the rear of the point. Reentrant faces 29 are provided on the shank, as in the other variants.

In the claims, when we use the word "dipper", we intend to include drag buckets, bucket line buckets, and other similar excavating instrumentalities. When we use the word "polygonal", we intend to include "square", and either with or without reentrant faces, as more particularly specified in the claims. When we use the word "plate", we intend to include cast, structural, and other forms of plate.

25 Having now described and illustrated one form of our invention, we wish it to be understood that our invention is not to be limited to the specific form or arrangement of parts hereinbefore described, except in so far as such limitations are specified in the appended claims.

We claim:

1. In a dipper-tooth for excavators, the combination of a wedge-shaped earth-engaging point;

and a shank for wedging into a socket on the dipper, said shank having opposed flat converging bearing faces, and opposed reentrant bearing faces; the wedge-shaped point having its non-converging sides carry recesses for the reception of the dipper lip.

2. In a dipper-tooth for excavators, the combination of a wedge-shaped earth-engaging point; and a tapered shank of polygonal cross-section, for wedging into a socket on the dipper, at least one bearing face of the polygon being reentrant; the wedge-shaped point having its non-converging sides carry recesses for the reception of the dipper lip.

3. In a dipper-tooth for excavators, the combination of: an earth-engaging point; and a shank for wedging into a socket on the dipper, said shank having opposed flat converging bearing faces, and opposed reentrant bearing faces.

4. In a dipper-tooth for excavators, the combination of: an earth-engaging point; and a shank for wedging into a socket on the dipper, said shank having two pairs of opposed flat converging bearing faces, and opposed reentrant bearing faces; the flat bearing faces of each pair being inclined to each other at an obtuse-angle.

5. In a dipper-tooth for excavators, the combination of: an earth-engaging point; and a tapered shank of polygonal cross-section, for wedging into a socket on the dipper, at least one bearing face of the polygon being reentrant.

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