POINTS FOR DIGGING BUCKETS

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FIG. 1

FIG. 2

FIG. 3

FIG. 4

FLOYD B. EDWARDS

BY Frederick W. Turnbull

ATTORNEY
This invention relates to buckets of power shovels and more especially to removable and replaceable points or teeth to be used in such buckets.

Buckets of power shovels, back hoes, and the like are conventionally provided with a plurality of pick-like teeth or points that are more or less sharp so as to enter as easily as possible into, and loosen, the earth so the bucket may be filled by forward movement into the earth. The teeth used on such buckets are conventionally solid forgings, of considerable mass, to give strength to their pick-like shape. Such pick-like teeth, while having certain earth penetrating ability, possess little break-out action, and are expensive to make and to maintain.

It has been found that teeth or points made in accordance with the present invention have great strength compared to their weight, are less expensive to make, and to maintain, and have greater break-out action than conventional teeth or points.

It is, therefore, a primary object of the present invention to provide a novel tooth or point for the buckets of power shovels or back hoes and the like that is more effective in penetration and break-out action than previous points.

It is a further object to provide points that are inexpensive to make and easy to install and to replace, and that are capable of being made in an infinite variety of shapes and sizes.

Other and further objects and advantages will appear from the following specification taken with the accompanying drawings in which like characters of reference designate like parts in the several views and in which:

FIG. 1 is a perspective view of a tooth or point exemplifying the present invention;

FIG. 2 is a sectional view of a tooth or point exemplifying the present invention;

FIG. 3 is a side elevation of such a tooth or point mounted on a bucket;

FIG. 4 is a side elevation similar to FIG. 3 illustrating a modification.

The point of the present invention is made of an angle-bar shaped piece of metal. A body portion of angle bar provides wings 1 and 2 cut back at an angle of preferably about 55° to provide an elongated leading edge 3 and 4 leaving a sharp point at 5. The edges 3, 4, 5, of course, are the earth penetrating edges of the point and it will be noted that the surface 3, 4, 5 is a plane so that the outer edges of surfaces 3 and 4 are sharp.

Extending forward from the rearward or trailing edge of the "point" are aligned slots 6, 7 leaving a rearwardly extending V-shaped portion 8 to underlie and bear against the outer lower surface of bucket 9. The upper or wing portions 10 and 11, bonding slots 6 and 7, respectively, will, in use, tend to clamp bucket 9 against portion 8, and will be supported by the upper surface of bucket 9 to prevent flattening out of the angle.

A single bolt hole 12 is in FIGS. 1, 2 and 3 shown as being provided in the portion 8 to align with a corresponding hole in bucket 9 to receive a bolt 13 held fast by a nut 14. Other securing means than a bolt and nut may be used, such as a rivet. For extraordinarily heavy duty the ends of wing portions 10 and 11 may be somewhat extended and twisted to each present a portion lying flat on bucket as indicated at 10°. These portions may then be bolted down as seen at 13 in FIG. 4.

It will be noted that the angle portion between parts 1 and 2, extending rearwardly as portion 8 forms a very strong spine for the tooth. The raked back edges 3 and 4 are substantially sharp even after considerable hard usage.

The points of the present invention may be made of hard steel or alloy steel and may be formed, prior to heat treatment, by rolling, forging, or any other manufacturing process. The thickness of the arms 1, 2 of the angle may be of any suitable thickness which will, of course, depend on the particular service to which the points are to be put. Lighter weight teeth, that is, teeth having relatively thin arms or wings 1, 2 will be particularly suitable for digging in soil that is full of roots and free of rock.

The angle between wings 1, 2 is preferably 90 degrees. Other angles, however, may be selected, a wider angle giving a sharper edge 3 and 4 at the same rake angle of edges 3 and 4 with respect to the length of the "point," and less vertical strength, while a narrower or sharper V will give greater vertical strength and a somewhat blunter edge along 3 and 4. The angle of rake of surface 3, 4, 5, with respect to the bottom edge 5' of the tooth or point, is preferably approximately 35°, thus it is seen that the point 5 and the edges of 3 and 4 are quite sharp, but, at the same time, are backed up by the mass of the tooth, and are easily resharpened, when rounded by wear, since, as pointed out above, the surface 3, 4, 5 is a plane.

1. In combination a digging bucket having a forward digging edge to be forced into material to be dug, and a digging tooth, said digging tooth comprising an elongated tooth body V-shaped in transverse section composed of two wing portions merging at one edge to form said V-shaped body, said body being shaped to provide a forward sharpened end and a rearward notched end, the notch in said rearward end being shaped to embrace the forward digging edge of the digging bucket.

2. The combination of claim 1 in which the angle between the wings of the V is substantially 90 degrees and in which the forward sharpening and is formed by a plane surface lying at an angle of approximately 35° to the axis of the tooth.

3. In combination a digging bucket having a forward digging edge to be forced into material to be dug and a plurality of combined penetrating and scooping teeth mounted in side by side relation on said forward edge of said bucket, said teeth each comprising an elongated body portion of substantially V-shape in cross section and having leading and trailing edges and with the apex of the V-shaped body portion defining the bottom surface of the tooth, the sides of the body portion being inclined upwardly and cut back rearwardly from the apex of the V-shaped body portion to provide said leading edges, and aligned slots in said trailing edges extending forwardly toward said leading edge and embracing the forward edge of the digging body.

4. In combination a digging bucket having a forward digging edge to be forced into material to be dug and a plurality of combined penetrating and scooping teeth mounted in side by side relation on said forward edge of said bucket, said teeth each comprising an elongated body portion of substantially V-shape cross section and having leading and trailing edges and with the apex of the V-shaped body portion defining the bottom surface of the tooth, the sides of the body portion being inclined upwardly and cut back rearwardly from the apex of the V-shaped body portion to provide said leading edges, and aligned slots in said trailing edges extending forwardly toward said leading edge and shaped to accurately conform to and embrace the surfaces of sand digging body whereby deformation of said tooth increasing the angle of said V-shape of said tooth provides clamping stresses between said tooth and said digging body.

5. The device of claim 1 in which the portions of said
rearward notched end of the tooth embracing the forward digging edge of the bucket remote from the apex of said V-shaped body are twisted to be in close engagement with the upper surface of said digging edge, and securing means are provided to secure said portions to said digging bucket.

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