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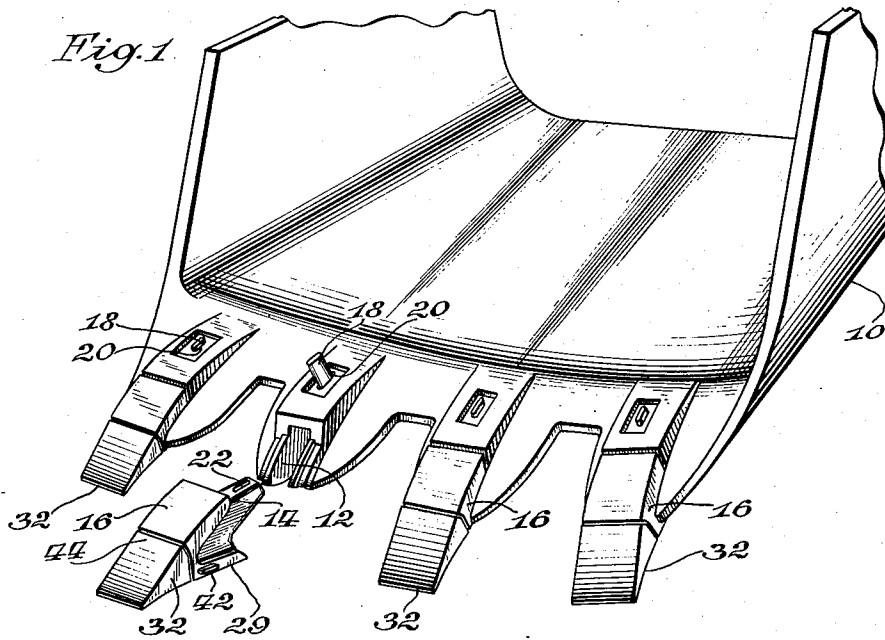
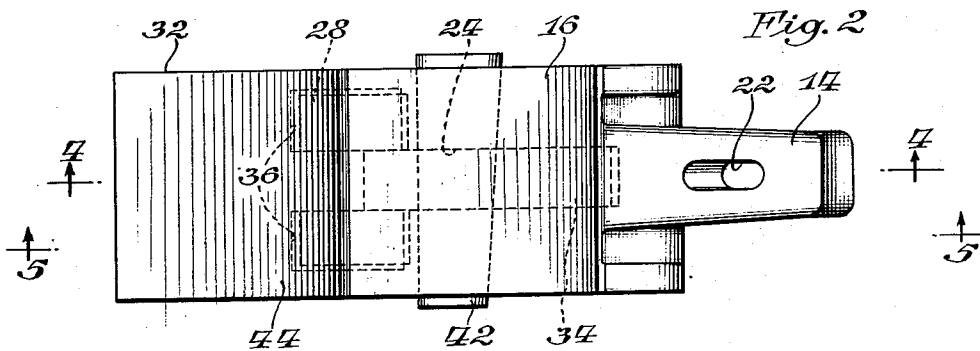
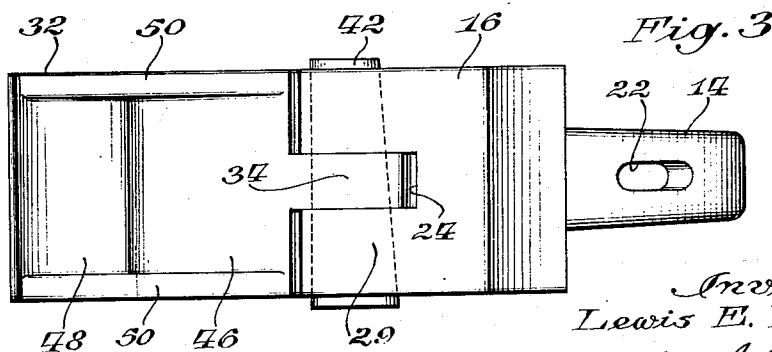
L. E. YOUNIE

2,229,267

COMPOSITE EXCAVATING TOOTH

Filed Feb. 5, 1938

2 Sheets-Sheet 1



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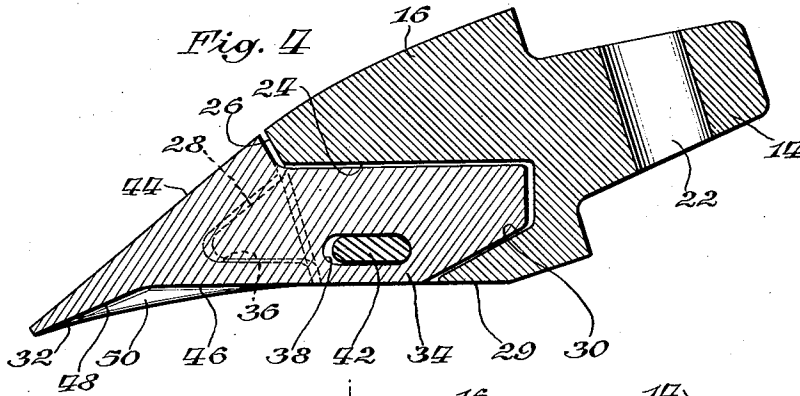
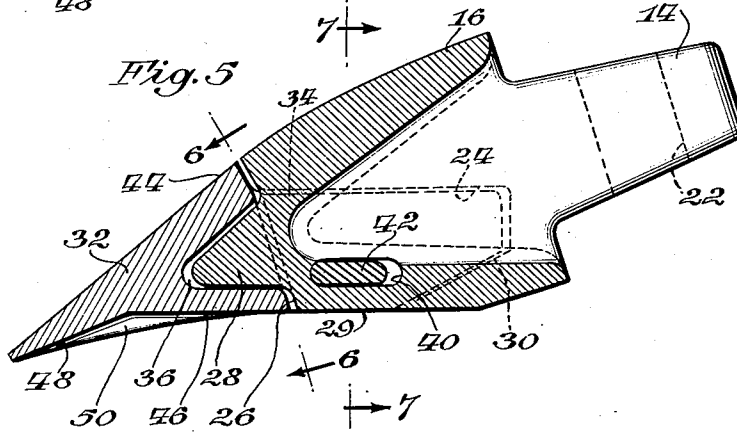
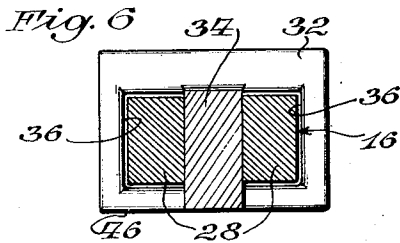
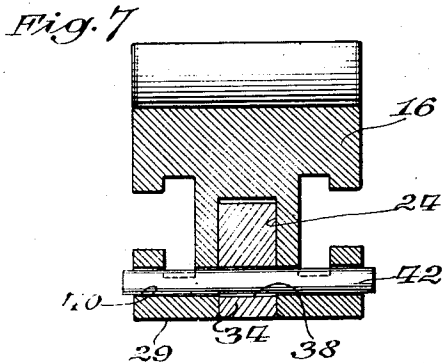
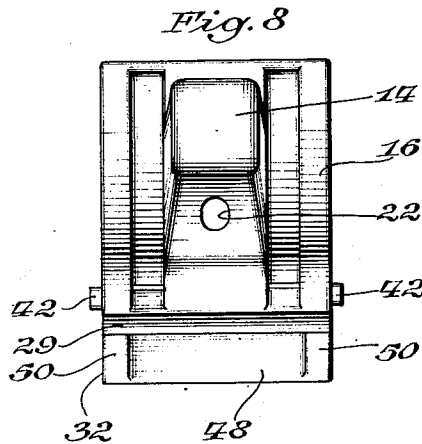
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COMPOSITE EXCAVATING TOOTH

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

2,229,267

COMPOSITE EXCAVATING TOOTH

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Application February 5, 1938, Serial No. 188,843

3 Claims. (Cl. 37—142)

This invention relates to excavating teeth used on the forward cutting edges of buckets, dippers, shovels and other types of power excavating machines.

Usually excavating teeth of this nature are manufactured in the form of steel wedges which are detachably secured to the forward cutting edges of power excavating implements. These teeth rapidly become dulled in use, and since they cannot readily be repointed, they are usually discarded after only a small portion of the metal comprising the tooth has been worn away.

With the above in view, it is an object of this invention to provide a novel tooth point and adapter, so constructed that after extensive wear, only the relatively inexpensive tooth point need be replaced.

A further object of the invention is to provide a novel and improved excavating tooth that requires less power in breaking up hard soil, such as cemented gravel, than teeth hitherto used.

A further object of this invention is to provide an adapter and a tooth therefor, which remains sharp even though extensively worn away in service.

A further object is to provide a novel tooth point with a thin entering edge and an undercut surface to permit operations with less power than hitherto required.

A further object of this invention is to provide a tooth with a thin cutting edge and a cut-away lower surface which has novel means to strengthen the corners of the cutting edge to prevent their being broken by heavy shocks.

A further object is to provide a tooth point having novel means to equalize the wear on its edges, so that the edges do not wear away faster than the central portion.

A further object of this invention is to provide a novel means for connecting a tooth point rigidly to an adapter.

Other objects and advantages will become apparent from the following description and from the accompanying drawings in which:

Fig. 1 is a front perspective view of a power excavating shovel embodying the present invention;

Fig. 2 is a plan view of the tooth and adapter comprising this invention;

Fig. 3 is a view of the bottom surface of the tooth and adapter shown in Fig. 2;

Figs. 4 and 5 are longitudinal sectional views taken in the direction of the arrows along the lines 4—4 and 5—5 respectively of Fig. 2;

Figs. 6 and 7 are vertical sectional views taken in the direction of the arrows along the lines 6—6 and 7—7 of Fig. 5;

Fig. 8 is a rear view of the adapter with the removable point in place.

Referring to the drawings in which like parts are designated by like numerals throughout the same:

A dipper front 10 is provided with a plurality of sockets 12, in this instance four, in which are secured tangs 14, extending from the rearward end of the tooth adapter 16. These tangs are secured in position within the sockets 12 by means of tapered keys 18 which are driven into registering slots 20 and 22 positioned transversely of the sockets 12 and tangs 14 respectively.

The above connection between the dipper front 10 and the tooth adapter 16, which has previously been used to connect wedge-shaped teeth to dipper fronts, forms no part of this invention and is given for clearness of understanding only.

The adapters 16 are all alike and interchangeable, and, therefore, a description of only one will suffice.

The adapter 16 is a roughly truncated wedge-shaped casting provided with a longitudinally extending slot 24 of rectangular cross-section. The forward face 26 of the adapter is provided with a nose 28 on each side of the slot 24 to aid in securing the tooth point to the adapter in a manner to be described subsequently. The top of the slot 24 extends back centrally of the tooth, substantially parallel to the lower face 29 thereof, nearly to the junction of the tang 14 with the wedge-shaped portion of the casting 16. In the forward portion of the casting 16, this slot 24 is open at the bottom, while the rearward portion 30 is upwardly inclined thereto, as best seen in Figures 4 and 5.

The cooperating point 32 is provided with a tang 34 and recesses 36, so formed that in assembled position, the tang will slide within the slot 24 with the noses 28 projecting within the recesses 36. Near the lower edge of the tang 34, a transverse slot 38, in alignment with a similar slot 40 which extends through the adapter casting 16, is provided to receive a tapered key 42. This tapered key 42 is driven into the aligned slots 38 and 40 to secure these two portions of the tooth rigidly together.

The top surface 44 of the forwardly projecting portion of the point 32 is substantially a plane surface and continues the longitudinal curve of the top surface of the adapter casting 16. The

rearward portion 46 of the lower surface of this point lies in the same plane as the lower surface of the adapter 16, while the forward portion of the lower face of the point 44 extends obliquely downwardly from the rear portion, so that the upper and lower surfaces of this point meet at a very acute angle and provide a cutting edge of substantially 15 degrees. To strengthen the corners of the cutting edge of this point 32, and to prevent the corners being worn away faster than the central portion, a rib 50 extends along each edge of the tooth and projects below the lower surfaces 46 and 48.

By using this construction, I am enabled to provide a cutting point having a relatively thin section and a relieved lower surface, while still maintaining the necessary strength to prevent the corners of the cutting edge from being broken away through hard usage. Also, as the forward portion of this tooth wears away in use, the cutting edge remains relatively sharp and square because of the acute angle of the forward portion and the strengthening ribs 50. Thus, even after the forward acute angle portion of this bit is completely worn away, the remaining portion is substantially as sharp as the hitherto solid wedge type tooth. Although the ribs 50 add greatly to the strength and wearing qualities of the forward portion of the digging point, I find that they do not appreciably affect the relative ease with which the tooth may be forced through extremely hard earth formations.

Because the relieved lower surface of the tooth point allows the tooth to be driven through the soil with much less effort, this tooth point wears away much more slowly than does the usual wedge-shaped tooth. Tests have indicated that the above is true, as well as the fact that abrasion on the adapters is so much reduced, that these adapters last almost indefinitely. Since practically all of the wear is taken by the small digging points 32, it will be seen that when this point is finally worn away and discarded, its replacement expense is very slight when compared to that of the larger wedge-shape teeth hitherto used.

The word "bucket" in the claims is used in its broad sense and is generic as to buckets, dip-pers and shovels used on various types of power excavating machines.

While I have illustrated and described a specific embodiment, it is to be understood that this

invention may assume various forms, and that the scope of my invention is to be limited only by the following claims.

I claim:

1. A composite excavating tooth comprising, an adapter for detachable mounting in a bucket edge, a downwardly and rearwardly inclined opening in said adapter, forwardly projecting noses adjacent said opening, a cutting point having a rearwardly extending tang inclined downwardly with respect to the center line of the tooth to fit said opening, the lower surface of the rearward portion of said tang being inclined upwardly with respect to the center line of the tang, depressions in said point adjacent said tang to enclose said noses, and means to secure the cutting point rigidly to said adapter.

2. A composite excavating tooth comprising, an adapter for detachable mounting in a bucket cutting edge, a downwardly and rearwardly inclined opening in said adapter, forwardly projecting noses adjacent said opening, a cutting point having a rearwardly extending tang to fit said opening, depressions in said point adjacent said tang to enclose said noses, said cutting point being substantially wedge-shaped with the lower surface thereof provided with an obtuse reentrant angle therein, the upper surface of said bit being in the same plane as the top surface of said adapter, the rearwardly extending leg of said reentrant angle being in the same plane as the lower surface of said adapter, and strengthening ribs at the sides of said tooth depending below the lower surface thereof for providing extra strength and wear resisting qualities at the corners of said cutting bit.

3. A composite excavating tooth comprising, a truncated wedge shaped adapter, a cutting bit detachably secured to said adapter, said cutting bit being substantially wedge shaped and having a reentrant angle in the lower surface thereof, the upper surface of said bit being in the same plane as the top surface of said adapter, the rearwardly extending leg of said reentrant angle being in the same plane as the lower surface of said adapter, whereby the earth flows smoothly from the surface of said bit to the surface of said adapter, thus minimizing wear on the adapter, and ribs along the sides of said bit and extending below the lower surface thereof to strengthen the corners of the cutting edge.

LEWIS E. YOUNIE.