July 21, 1931. G. E. EDMUNDS 1,815,649

REPLACEABLE EXCAVATOR TOOTH

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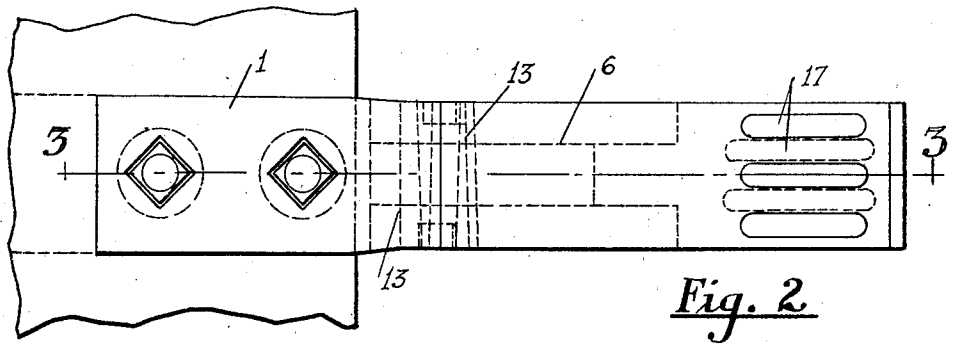

Fig. 2

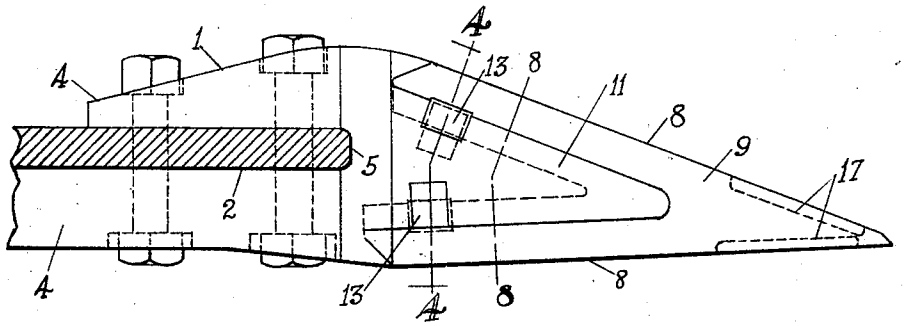

Fig. 1

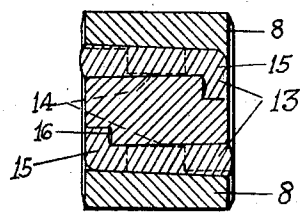

Fig. 4

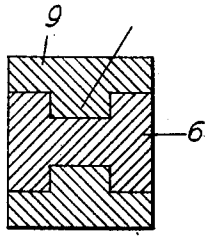

Fig. 8

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REPLACEABLE EXCAVATOR TOOTH

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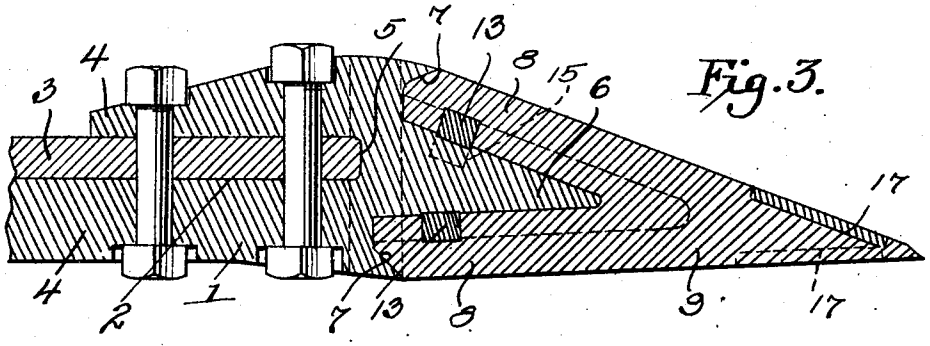


Fig. 3.

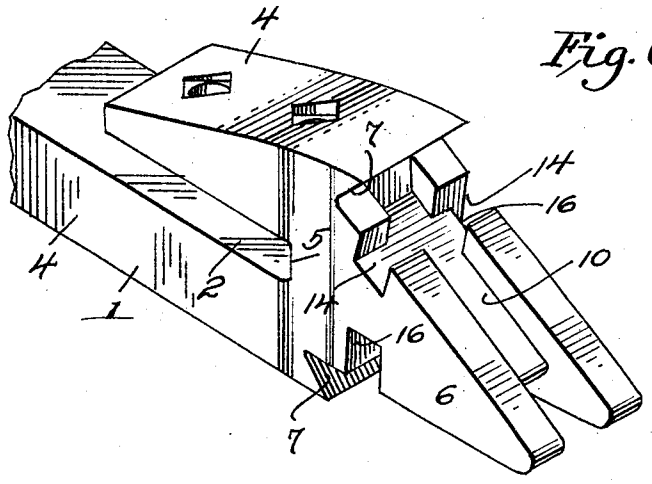


Fig. 6.

Fig. 7.

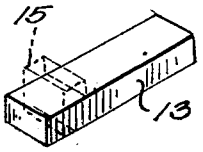
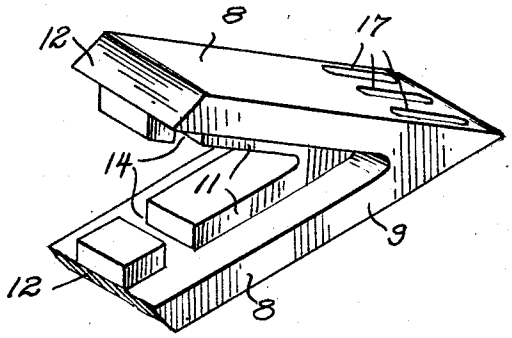


Fig. 5.



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UNITED STATES PATENT OFFICE

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REPLACEABLE EXCAVATOR TOOTH

Application filed February 24, 1930. Serial No. 430,709.

This invention relates to improvements in teeth for excavating implements, such as buckets, shovels, dredges, scoops, conveyors and the like, and has particular reference to the class of reversible teeth which consists of separable base and point members and wherein the point member is of such design that after it has received a desired degree of wear, its operating position on the base member may be reversed so as to present a fresh or unworn surface, to the end that the life of the tooth will be effectively increased.

It is a primary object of the present invention to provide for a more secure form of fastening or connection between the separate point and base members, in order that the tooth as a whole will be of stronger mechanical design than is possible with previous types of connections and to permit of the rigid association of the point and base members to the end of avoiding relative movement therebetween.

It is another object of the invention to form the point member with spaced rearwardly diverging jaws between which a wedge shaped extension on the forward end of the base member is received, and wherein the jaws are provided with longitudinally extending ribs which are receivable within similarly formed grooves provided in the base member in order to retain the base and point members in longitudinally aligned relationship, and wherein the ends of the jaws are provided with inclined surfaces or end walls which engage with correspondingly formed surfaces formed with the base member at the rear end of the wedge extension so that the thrusts and strains imparted to the point member when the tooth is in operation will be effectively transmitted to and absorbed by the base member without breakage or injury to the parts of the tooth.

Further, it is an object of the present invention to connect the separable point and base members by the employment of wedge keys which are driven into the sides of the tooth so as to be positioned in registering transverse keyways formed in the base and point members, and whereby provision is made for preventing the accidental withdrawal of the keys from their locking positions, one of said locking keys being associated with each of the jaws in the point member to the end of providing a very secure locking connection between the point and base members and to prevent any looseness or vibration between said members when the tooth is in use.

With these and other objects in view, which will appear as the description proceeds, the invention consists in the novel features of construction, combination of elements and arrangement of parts hereinafter to be more fully described and pointed out in the appended claims.

In the accompanying drawings:

Figure 1 is a view in side elevation of an excavating tooth constructed in accordance with the features in the present invention,

Figure 2 is a top plan view thereof,

Figure 3 is a vertical longitudinal sectional view taken through the tooth on the line 3—3 of Figure 2,

Figure 4 is a transverse vertical sectional view taken through the tooth on the line 4—4 of Figure 1,

Figure 5 is a detail perspective view of the point member of the tooth,

Figure 6 is a corresponding view of the base member,

Figure 7 is a detail perspective view of one of the locking keys,

Figure 8 is a vertical transverse sectional view taken on the line 8—8 of Figure 1.

Referring more particularly to the drawings, the numeral 1 designates the base member of the excavating tooth comprising the present invention. In the particular form of the tooth illustrated the base member consists of a steel casting of integral formation. The rear portion of the base member is provided with a longitudinally extending recess 2 which is adapted to receive, for example, the lip 3 of an excavating bucket or scoop. The recess 2 is formed by vertically spaced rearwardly extending fingers 4 which are provided with vertical openings adapted for the reception of fastening bolts or other corresponding securing elements. These bolts do not receive the major strains which are ap-

plied to the bucket when the latter is in use for the reason that the vertical end wall 5 of the recess engages with the corresponding end wall of the bucket lip 3 to relieve the fastening elements as far as possible of the operating stresses.

The forward portion of the base member 1 is provided with an integral wedge shaped extension 6, which terminates rearwardly in angularly disposed walls 7. The extension 6 is formed to be positioned between a pair of spaced rearwardly diverging jaws 8 which constitute an integral part of a separable point member 9. To maintain the point member in position upon the inclined surfaces of the extension 6, the upper and lower surfaces of said extension are provided with longitudinally extending grooves 10 which open to the front of the extension. These grooves are adapted for the reception of longitudinally extending ribs 11 which are formed integrally with the inner surfaces of the jaws 8. Similarly, the rear ends of the jaws 8 are inclined, as at 12, to engage with the inclined walls 7 of the base member 1.

To hold the base and point members together when assembled as specified, use is made of a pair of locking or wedge keys 13. These keys are of tapered construction and are adapted to be driven into transversely extending registering keyways 14 which are formed in the inclined walls of the nose extension 6 and the ribs 11 of the point member. The keys occupy reverse positions in the tooth with respect to each other. That is, the larger end of one key is disposed on one side of the tooth while the larger end of the other key is disposed on the opposite side of the tooth and the keyways are formed accordingly. It will be seen that by forcing the keys into their operative positions within the keyways 14 the ribs 11 of the point member will be engaged so that the adjoining surfaces of the point and base members will be forced into firm frictional contact, preventing removal through accidental separation of the point member from the base member. Preferably, in order to retain the keys in their applied positions, the narrower ends thereof are bent downwardly at a right angle, as indicated at 15, and are positioned within depressions 16 formed in the side walls of the extension 6, so that accidental withdrawal of the keys will be rendered highly improbable. The double connection thus provided by the keys 13 produces a strong union between the separable base and point members which is capable of withstanding the shocks and jolts incident to the operation of the tooth without loosening or becoming out of order. Especially, the tooth is of such construction that it withstands the severe strains which are set up by the sharp dropping of a bucket or scoop from an elevated position to a base digging position. In fact, it is due probably to this dropping of the bucket that most of the tooth breakage occurs and the present tooth has been particularly designed to withstand such abuse. Moreover, by the elongated construction of the nose extension 6 and the secure connection provided thereby between the base and point members, the forward portion of the latter may be of unusually elongated construction so that it may withstand a considerable degree of wear, sharpening or other shortening influences before complete replacement is required. The point member is, of course, reversible on the base member so that wear may be balanced with regard to the opposite sides of the point member and to thereby obtain greater life from the point member and more efficient use thereof. It is preferable to form the upper and lower walls in the tip of the point member with longitudinally extending grooves, as indicated at 17. These grooves are adapted to be filled with an extremely hard, wear-resisting alloy in order that such alloy may be spread over the forward end of the point member to protect the wear receiving surfaces thereof and yet at the same time may be firmly anchored in connection with the point member.

What is claimed is:

1. An excavating tooth formed to comprise a base member, a substantially wedge shaped nose extension projecting forwardly and integrally from said base member, said extension being of approximately the same width as said base member but of reduced thickness, there being inclined walls connecting the upper and lower surfaces of the extension with the corresponding surfaces of the base member, a reversible point member formed to include rearwardly diverging jaws providing between them a pocket in which said nose extension is receivable, said jaws being of substantially the same width as said extension and base member so that the point member will provide a symmetrical continuation of the base member, lugs projecting integrally from the inner surfaces of said jaws and receivable within grooves provided in the upper and lower surface of said extension, and upper and lower wedge keys positioned in transversely extending keyways formed in said extension and engageable with the walls of said recesses and said lugs to maintain the point and base members in secured frictional relationship, said wedge keys occupying reversed positions in said keyways with respect to each other whereby the thicker end of one of said keys will be disposed on one side of said tooth and the thinner end of the other of said keys extending on the opposite side of said tooth, the thicker ends of said wedge keys being turned at substantially right angles to the body portion thereof to lock said keys against longitudinal movement.

2. An excavating tooth formed to com-

prise a base member, a substantially wedge shaped nose extension projecting forwardly and integrally from said base member, said extension being of approximately the same width as said base member but of reduced thickness, there being inclined walls connecting the upper and lower surfaces of the extension with the corresponding surfaces of the base member, a reversible point member formed to include rearwardly diverging jaws providing between them a pocket in which said nose extension is receivable, said jaws being of substantially the same width as said extension and base member so that the point member will provide a symmetrical continuation of the base member, lugs projecting integrally from the inner surfaces of said jaws and receivable within grooves provided in the upper and lower surface of said extension, and upper and lower wedge keys positioned in transversely extending keyways formed in said extension and engageable with the walls of said recesses and said lugs to maintain the point and base members in secured frictional relationship, said wedge keys occupying reversed positions in said keyways with respect to each other whereby the thicker end of one of said keys will be disposed on one side of said tooth and the thicker end of the other of said keys extending on the opposite side of said tooth, the thinner ends of said wedge keys being turned at substantially right angles to the body portion thereof to lock said keys against longitudinal movement, and recesses provided in the sides of said extensions for the reception of the angular turned ends of said keys.

In testimony whereof I affix my signature.

GLENN E. EDMUNDS.