United States Patent

Ratkowski

[15] **3,685,178**

[45] **Aug. 22, 1972**

[54] **DIPPER TEETH**

[72] Inventor: **Thomas A. Ratkowski,** Chicago Heights, Ill.

[73] Assignee: **Abex Corporation,** New York, N.Y.

[22] Filed: **July 10, 1970**

[21] Appl. No.: **53,854**

[52] **U.S. Cl.** .....**37/142 A,** 85/8.3

[51] **Int. Cl.** **E02f 9/28**

[58] **Field of Search** .....37/142 R, 142 A; 85/8.3; 287/53 R, 53 H, 53 LK, 103 R

[56] **References Cited**

UNITED STATES PATENTS

3,520,224	7/1970	Hewsley et al.	37/142 A
3,526,049	9/1970	Nichols	37/142 A
3,277,592	10/1966	Launder et al.	37/142 A
3,382,005	5/1968	Kiefer	85/8.3 X
2,368,611	1/1945	Charnock	85/8.3 X
3,121,289	2/1964	Eyolfson	37/142 A
2,702,490	2/1955	Launder	37/142 A X
3,511,126	5/1970	Watts	37/142 R

Primary Examiner—Robert E. Pulfrey
Assistant Examiner—Eugene H. Eickholt
Attorney—Kinzer, Dorn and Zickert

[57] **ABSTRACT**

A dipper tooth comprising a replaceable point part with opposed walls is mounted on the complementary nose portion of an adapter part, the two parts having openings in registry defining a key-way to receive a retainer key holding the two parts together. The retainer key is of a length to span the key-way, and is characterized by two parallel rigid sections separated by a layer of resilient material. One of the rigid sections is the back and the other the front of the key. The front of the key has protuberances thereon normally fitting in corresponding sockets presented by the key-way.

4 Claims, 3 Drawing Figures

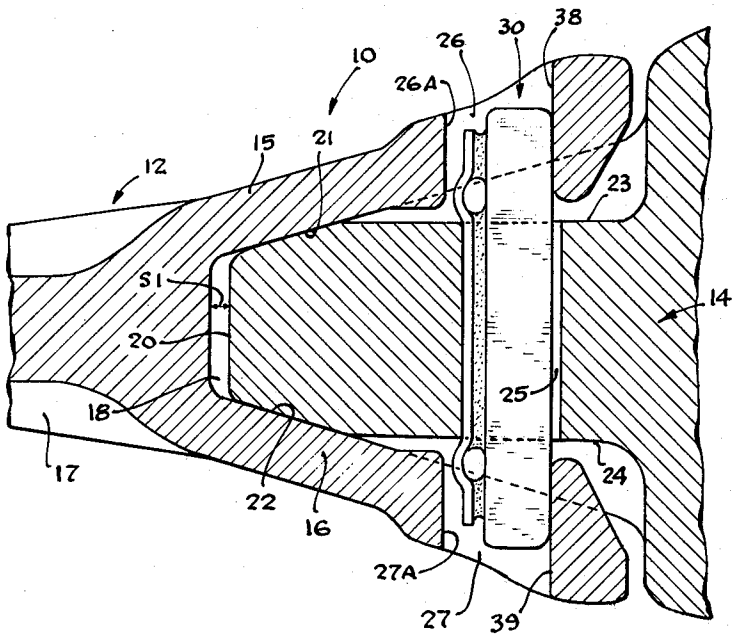


Fig.1

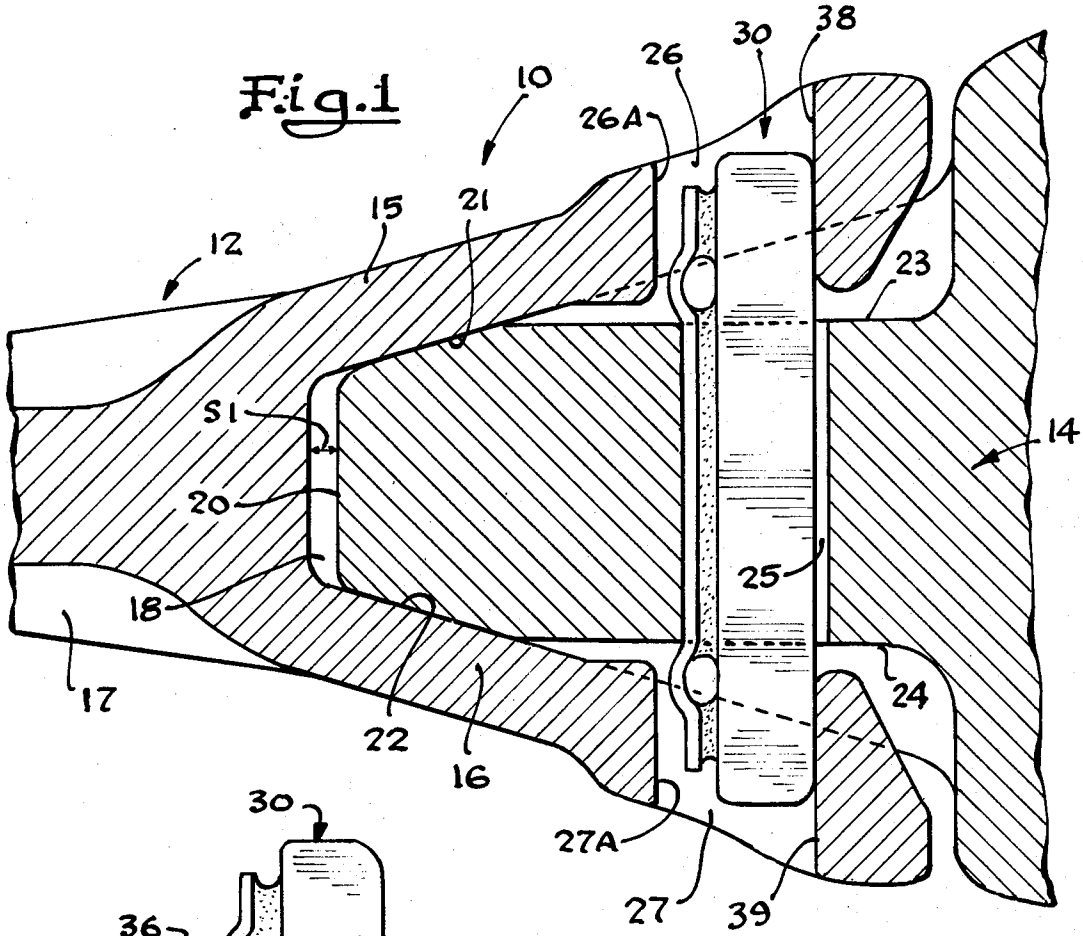
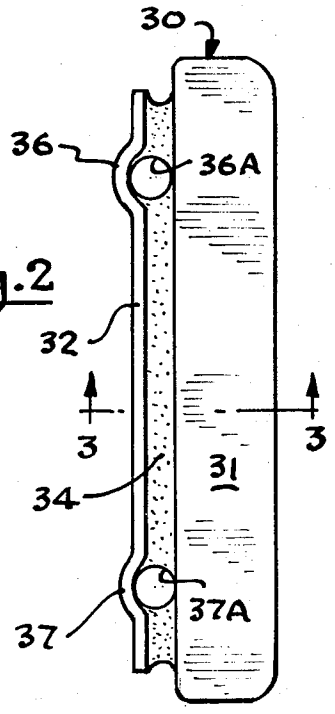


Fig.2



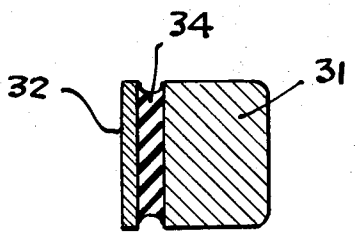


Fig.3

Inventor
Thomas A. Ratkowski
By Kinzer, Dorr and Zickert
Attorneys

DIPPER TEETH

This invention relates to a so-called dipper tooth used on diggers, buckets, trenchers and the like as an earth-working member, and characterized by a replaceable point detachably mounted on an adapter.

It is customary in the construction of dipper teeth to utilize two principal parts, namely, a point or cap and an adapter on which the point is detachably fitted. In turn, the adapter is mounted on the lip of the bucket, shovel or other principal supporting member of the earth-moving equipment. By and large, the most common way of holding the point on the adapter is by way of a pin or key inserted in a key-way extending through the assembled parts. The parts are quite heavy and large, and a significant amount of force is required to drive the key home or displace it, especially since one function of the key, in many dipper tooth constructions, is to draw the point tightly up on the adapter which is the present case.

It would, therefore, be a distinct advantage to be able to drive the pin in or out of place from either direction, and the primary object of the present invention is to produce a construction by which this may be accomplished.

Other and further objects of the present invention will be apparent from the following description and claims and are illustrated in the accompanying drawings which, by way of illustration, show a preferred embodiment of the present invention and the principle thereof and what is now considered to be the best mode contemplated for applying that principle. Other embodiments of the invention embodying the same or equivalent principle may be used and structural changes may be made as desired by those skilled in the art without departing from the present invention.

In the drawings:

FIG. 1 is a fragmentary sectional view of a dipper tooth constructed in accordance with the present invention;

FIG. 2 is a side elevation of the retainer key; and

FIG. 3 is a sectional view on the line 3—3 of FIG. 2.

The dipper tooth **10**, FIG. 1, in many respects is of standard construction in that it is characterized by a digging point **12** supported on an adapter **14**, the latter in turn normally being supported at the front edge of a bucket, scraper or the like.

The point **12** is defined by opposed upper and lower walls **15** and **16** which are convergent in a forward direction, defining a forward digging point or edge **17** which bears the brunt of the work.

The walls **15** and **16** are spaced from one another to define a mounting socket **18** of truncated pyramidal shape, and the adapter **14** has a forwardly projecting nose portion **20** which fits complementally the socket **18** while allowing for a slight separation S1 between the forward wall of the nose and the opposed interior surface of the point, permitting the parts to wear in as will be further explained below. In any event, the opposed upper and lower surfaces of the adapter nose have the same degree of slope as the interior surfaces **21** and **22** of the walls **15** and **16** of the point **12**.

The portion of the adapter nose rearward of the upper and lower inclined surfaces **21** and **22** is flattened at **23** and **24**, and the ends of an opening **25**, extending through the adapter nose, open at such flat walls **23** and **24**.

The walls of the point **15** and **16** extend rearward to overlie the flat surfaces **23** and **24**, but are spaced therefrom for a purpose to be explained, and openings **26** and **27** are formed therein, the arrangement being such that when the point **12** is fitted complementally to the adapter nose, the openings **25**, **26** and **27** are in registry to define a key-way which receives a retainer key **30** serving to hold the parts **12** and **14** together.

The key is characterized by a pair of parallel rigid metal plates or elements **31** and **32**, FIG. 2, part **31** being the more massive and representing the back of the key. Part **32** of the key is of spring steel and represents the front of the key, the back **31** and front **32** being separated by a layer of resilient material **34**, preferably rubber, vulcanized to the opposed surfaces of the front and back of the key to afford a unitary key.

The sheet of spring steel constituting the front of the key is formed with a pair of forwardly projecting protuberances **36** and **37**, and the layer of rubber immediately there behind is recessed or apertured, **36A** and **37A**, to reduce the spring rate of the layer of rubber at these two areas.

As shown in FIG. 1, the key **30** is of a length to generously span the key-way. Thus, the ends of the key repose in the openings **26** and **27** of the dipper tooth point and the intermediate portion thereof reposes in the opening **25** of the adapter. In the installed state or condition shown in FIG. 1, the layer of rubber is under compression, and the rear surfaces of the key at the ends thereof bear with great force against the opposed surfaces **38** and **39** of the point which bound or mark the rear limit of the openings **26** and **27**. Thus, it will be seen that when the key is driven home, it also serves to draw the point up tightly on the adapter while allowing sufficient separation at S1 to allow for normal wear between the inside surfaces of the point and the opposing surfaces **21** and **22** of the adapter.

In order that the key will itself be held in place, the protuberances **36** and **37** are related to recesses presented by the key-way. In this instance, the recesses are at the ends of the key-way opening **25** in the adapter, such being achieved by appropriately spacing the opposing surfaces of the point, which is to say that the forward walls **26A** and **27A** of the key-way openings **26** and **27** are offset longitudinally as by being spaced forwardly of the ends of the opening **25**, and the interior surfaces **21** and **22** of the upper and lower walls of the point are amply spaced vertically from the opposing surfaces **23** and **24** of the adapter thereby affording sockets or pockets into which the protuberances **36** and **37** may expand.

It will be seen from the foregoing that it is a relatively simple matter to drive the key home or to displace it relative to the key-way **25–26–27**. In this connection it will be recognized that since the key and key-way are symmetrical in all respects there is no preferred direction for driving the key home or displacing it.

I claim:

1. In a dipper tooth comprising a replaceable point part with opposed walls mounted on a nose portion of an adapter part, the two parts having openings in registry defining a key-way to receive a retainer key holding the two parts together: a retainer key of a length to span the key-way, said key being characterized by a rigid member of given thickness and a thinner strip member of spring steel, said members being separated

by a layer of resilient material, one of the members being the back and the other the front of the key, said strip member of the key having protuberances thereon normally fitting in corresponding sockets presented by the key-way, and in which the layer of resilient material behind the protuberances is of less spring rate than the remainder.

2. In a dipper tooth assembly comprising a replaceable point part with opposed walls mounted on a nose portion of an adapter part to extend longitudinally thereof, the two parts having transverse openings in registry defining a key-way to receive a retainer key holding the two parts together, a retainer key of a length to span the key-way, said key being characterized by a rigid member of given thickness and a thinner strip member of spring steel, said members being separated by a layer of resilient material, one of said members being the back and the other the front of the key, said strip member of the key having protuberances thereon normally fitting in corresponding sockets presented by the key-way, said openings defining the key-way including an opening in the adapter nose extending therethrough and a pair of aligned openings in the opposed walls of the point extending therethrough, said sockets being presented by virtue of the walls of the point having he openings being spaced longitudinally of the ends of the opening in the adapter and further by the interior surfaces of the point adjacent the openings therein being spaced vertically from the opposing surfaces of the adapter nose, and wherein the layer of resilient material behind the protuberances of the key is of less spring rate than the remainder.

3. An assembly according to claim 2 wherein the key is flat on the side opposite the protuberances.

4. A key according to claim 1 wherein the key is flat on the side opposite the protuberances.

* * * * *