Nov. 19, 1929. W. E. MILEY 1,736,045

TEETH FOR EXCAVATING DIPPERS AND THE LIKE

Original Filed Aug. 17, 1926 2 Sheets-Sheet 1

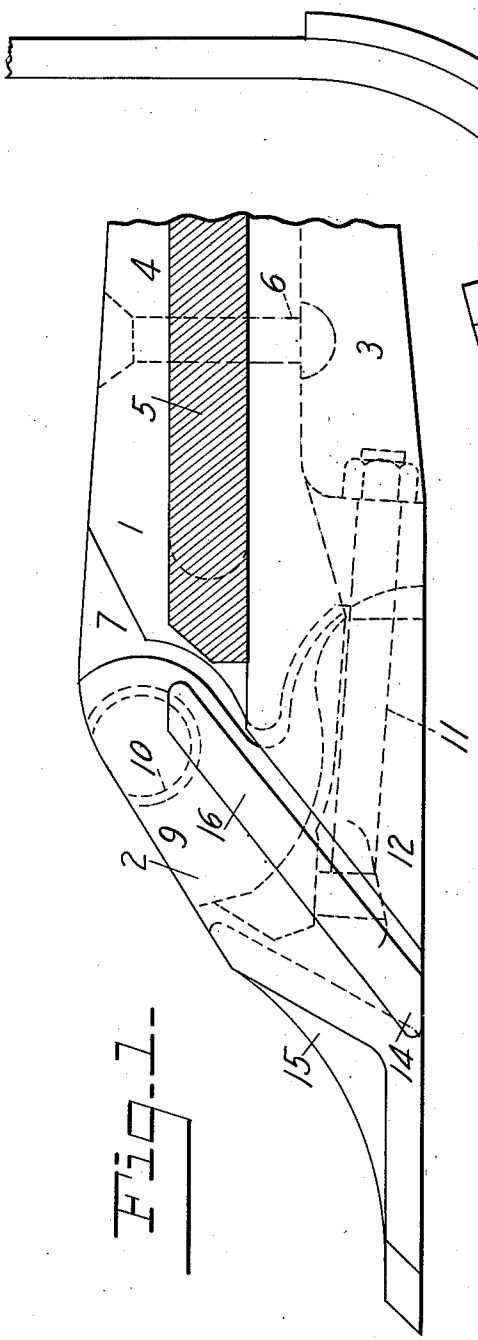


FIG. 1.

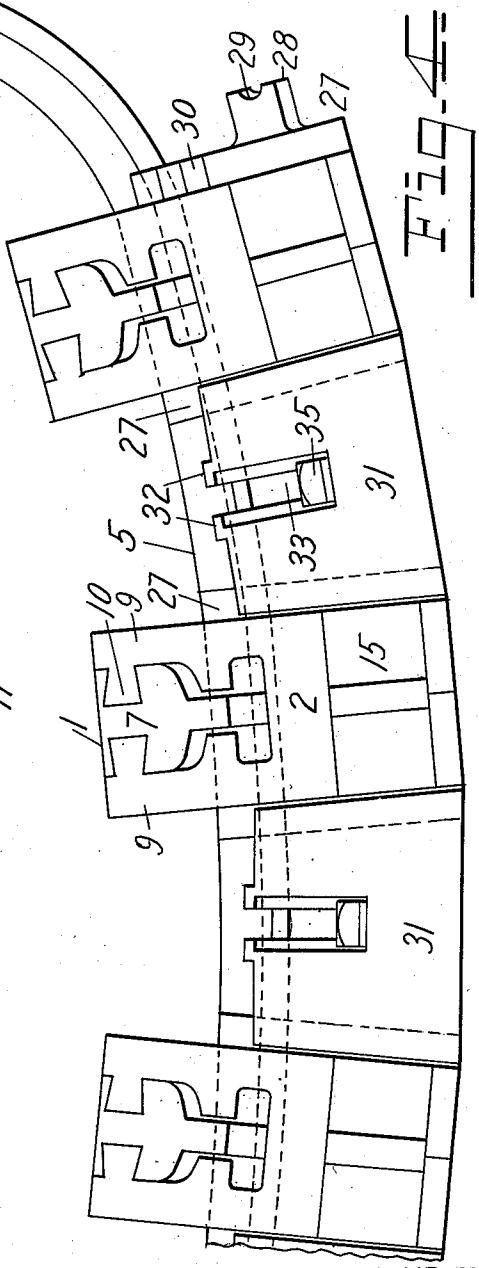


FIG. 4.

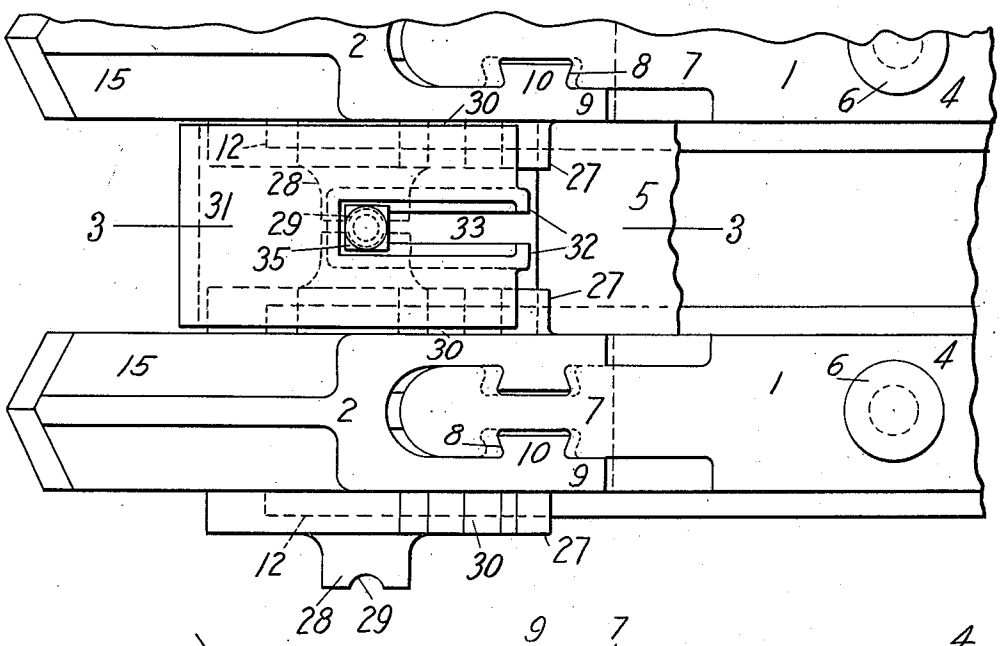
INVENTOR.
WALTER E. MILEY.
Edward L. Reed.
his ATTORNEY.

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Fig. 2.



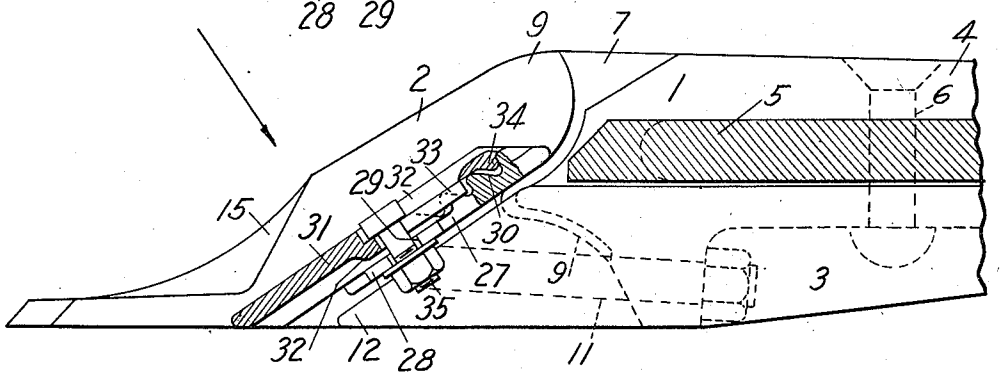


Fig. 3.

INVENTOR.
WALTER E. MILEY.
Edward L. Reed.
his ATTORNEY.

Patented Nov. 19, 1929 1,736,045

UNITED STATES PATENT OFFICE

WALTER E. MILEY, OF MARION, OHIO, ASSIGNOR TO THE MARION STEAM SHOVEL COMPANY, OF MARION, OHIO, A CORPORATION OF OHIO

TEETH FOR EXCAVATING DIPPERS AND THE LIKE

Original application filed August 17, 1926, Serial No. 129,842. Divided and this application filed February 7, 1928. Serial No. 252,602.

This invention relates to teeth for excavating dippers and the like and is designed more particularly for use on the excavating dippers of power shovels, the present application being a division of the application for patent filed by me August 17, 1926, Serial No. 129,842.

The dipper of a power shovel is usually provided with a plurality of teeth spaced apart across the forward edge of the front of the dipper. These teeth extend forwardly from the forward edge of the dipper front for a considerable distance and each tooth has a rearwardly extending portion arranged beneath the dipper front, so that the forward edge of the front is arranged at a distance from the forward ends of the teeth and from the lower surfaces of the teeth and will pass over, without removing, considerable quantities of material which lies between the paths of the teeth. When the dipper is in its fully retracted position and is resting upon the points of the teeth the dipper front is in an inclined position with relation to the surface of the work and the forward edge thereof is spaced such a distance from said surface that it will pass over relatively large quantities of material lying between the paths of the teeth. As the dipper is advanced during the excavating operation the front will assume a position approximately parallel with the surface of the work but even in this position the forward edge of the dipper front is spaced from the surface of the work a distance corresponding to the thickness of the lower portions of the teeth and will pass over considerable quantities of material. As a result the surface of the work is left in a rough condition with relatively large quantities of loose material thereon and in many classes of excavating work, such as street and road work, this is highly objectionable and it is necessary that the surface be smoothed and the loose material removed by means other than the dipper. Further, the forward edge of the dipper front functions as a cutter and is therefore subject to severe wear which makes it necessary to renew the same at more or less frequent intervals.

One object of the invention is to provide an excavating dipper having two-part teeth with devices carried by the removable points of said teeth to protect the dipper front from wear.

A further object of the invention is to provide an excavating dipper having two-part teeth with devices removably mounted on the detachable points of said teeth and arranged to form cutters and to protect the dipper point from wear.

A further object of the invention is to provide an excavating dipper having two-part teeth with supplemental cutters mounted on the removable points of said teeth and adjustable thereon to maintain the edges thereof in proper relation to said points.

Other objects of the invention will appear as the device is described in detail.

In the accompanying drawings Fig. 1 is a side elevation of a dipper tooth having the supplemental device formed integral with the point thereof; Fig. 2 is a plan view of portions of two teeth showing a single supplemental device arranged between but carried by the points of the two teeth; Fig. 3 is a section taken on the line 3—3 of Fig. 2; and Fig. 4 is a front elevation of a portion of the dipper showing the teeth and supplemental devices.

In these drawings I have illustrated two embodiments of my invention and have shown the same as applied to a two-part tooth of the type shown and described in the application for patent filed by me April 22, 1925, Serial No. 24,957. It will be understood, however, that these particular embodiments have been chosen for the purpose of illustration only, that the invention may take various forms and may be applied to dipper teeth of various kinds.

In that form of the invention here illustrated I have shown the same as applied to a two-part tooth comprising a base 1 and point 2 detachably secured to said base. The upper portion of the tooth is shaped, at 15, to provide what is known as a duck bill tooth. The base of the tooth has a rearwardly extending lower portion 3 and a rearwardly extending upper portion 4 spaced apart to receive between them the forward portion of the dipper

front 5, which is rigidly secured to the tooth by means of one or more rivets 6 extending through the same and through the upper and lower portions of the tooth. The base of the tooth also has a forwardly extending central portion 7 provided in both sides thereof with recesses 8. The point 2 of the tooth has rearwardly extending portions or arms 9 spaced apart to receive between them the central forwardly extending portion 7 of the base and each arm has an inwardly extending lug 10 adapted to enter the adjacent recess 8 in the base. After the lugs have been inserted in the recesses the point of the tooth is moved to the position shown in the drawings and is rigidly secured in that position by means of a bolt 11. The base of the tooth also has forwardly extending arms 12, the forward portions of which contact with the respective sides of the point 2 and brace the same against lateral strain.

Arranged alongside of the several teeth and between adjacent teeth are supplemental devices of such a character and so arranged that they will serve to remove from the surface of the work any material lying between the teeth below the front of the dipper and will also serve to protect the dipper front from wear. Preferably these devices are in the form of supplemental cutters mounted on the points of the teeth in inclined positions with their forward ends adjacent to the lower surface of the teeth and their upper ends adjacent to and in advance of the forward edge of the dipper front so that the material between the teeth will be lifted thereby and delivered onto the dipper front.

In that form of the device shown in Fig. 1 the supplemental devices or cutters are in the form of plates 16 formed integral with the removable points of the teeth and extending laterally from the respective sides thereof, the forward edges of the plates being beveled to provide cutting edges as shown at 14. With this arrangement, the supplemental cutter forms an integral part of the point of the tooth and is applied to and removable from the base along with that tooth.

In Figs. 2 and 3, I have shown the supplemental device as formed separately from the teeth and removably mounted on the points thereof. In this form also the points of the teeth are provided with ribs or plates 27 extending laterally therefrom and inclined upwardly and rearwardly and the supplemental cutter is in the form of a single blade 31 which is mounted on the laterally extending portions 27 of the points of the teeth and is rigidly secured thereto. As here shown, the laterally extending portions or plates 27 of the points are relatively narrow but are provided with lugs 28 extending one toward the other and having in their adjacent edges recesses 29 which combined to form a bolt hole to receive a bolt 35 which extends through the supplemental cutter. In the present arrangement, the plate 31 which forms the supplemental cutter has a downwardly extending or depressed portion 32 which fits between the ribs or plates 27 and which is provided with a longitudinal slot 33 to receive the bolt 35, the head of the bolt being seated in the depression. In this manner the cutter may be adjusted lengthwise of the supporting plates to maintain its forward edge in proper relation to the points of the teeth. Preferably this forward edge of the cutter is substantially flush with lower surfaces of the points so that it will remove all material from the surface of the work. While the bolt alone may be relied upon to secure the supplemental cutter in position on the supports I have shown means for positively locking the cutter against displacement. To this end the supporting plates 27 have near their rear ends a series of teeth 30 and and the blade or cutter has near its opposite edges depending teeth 34 adapted to cooperate with the teeth 30 to hold the cutter against lengthwise movement due to the thrust thereon. It will be apparent that the supplemental cutters are carried by the points of the teeth and may be mounted on or removed from the bases along with the points, and that the cutters may also be adjusted to move their forward edges downwardly as they wear away and thus maintain these edges in proper relation to the points. If the supplemental cutter is worn out before the point of the tooth is worn out it may be removed and a new cutter substituted therefor.

While I have shown and described certain embodiments of my invention I wish it to be understood that I do not desire to be limited to the details thereof as various modifications may occur to a person skilled in the art.

Having now fully described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In an excavating dipper, a plurality of teeth each comprising a base secured to the front of said dipper and a point detachably secured to said base, and parts carried by said points of said teeth and arranged wholly between said teeth and in advance of the dipper front to protect the latter from wear.

2. In an excavating dipper, a plurality of teeth each comprising a base secured to the front of said dipper and a point detachably secured to said base and having its lower surface below the plane of said front, and inclined parts carried by the removable points of said teeth, arranged between adjacent teeth and extending from the lower portions of said teeth upwardly and rearwardly to positions adjacent to the forward edge of said dipper front.

3. In an excavating dipper, a plurality of teeth each comprising a base secured to the

front of said dipper and a point detachably secured to said base, supplemental devices arranged between adjacent teeth, and means located between said teeth for supporting said supplemental devices on the points of the respective teeth.

4. In an excavating dipper, a plurality of teeth each comprising a base secured to the front of said dipper and a point detachably secured to said base, the points of said teeth having parts forming supports, supplemental cutters arranged between adjacent teeth and mounted on said supports, and means for rigidly securing said cutters to said supports.

5. In an excavating dipper, a plurality of teeth each comprising a base secured to the front of said dipper and a point detachably secured to said base, said points having laterly extending parts forming supports, a single cutter arranged between each pair of adjacent teeth and mounted on the supports of the respective points, and means for rigidly but removably securing said cutter to said supports.

6. In an excavating dipper, a plurality of teeth each comprising a base secured to the front of said dipper and a point detachably secured to said base, said points having laterally extending parts forming supports, a single cutter arranged between each pair of adjacent teeth and adjustably mounted on the supports of the respective points, and means for rigidly securing said cutter in adjusted positions on said supports.

7. In an excavating dipper, a plurality of teeth each comprising a base secured to the front of said dipper and a point detachably secured to said base, the point of each tooth having inclined plates extending laterally from the respective sides thereof, cutters arranged between adjacent teeth and supported by the respective inclined plates, and means for rigidly securing said cutters to said inclined plates.

8. A tooth for an excavating dipper or the like comprising a base and a point detachably secured to said base and having its rear portion of a thickness substantially equal to the thickness of the adjacent portion of said base, and inclined plates rigidly mounted on said point between the upper and lower edges thereof and extending laterally from the respective sides thereof.

In testimony whereof, I affix my signature hereto.

WALTER E. MILEY.