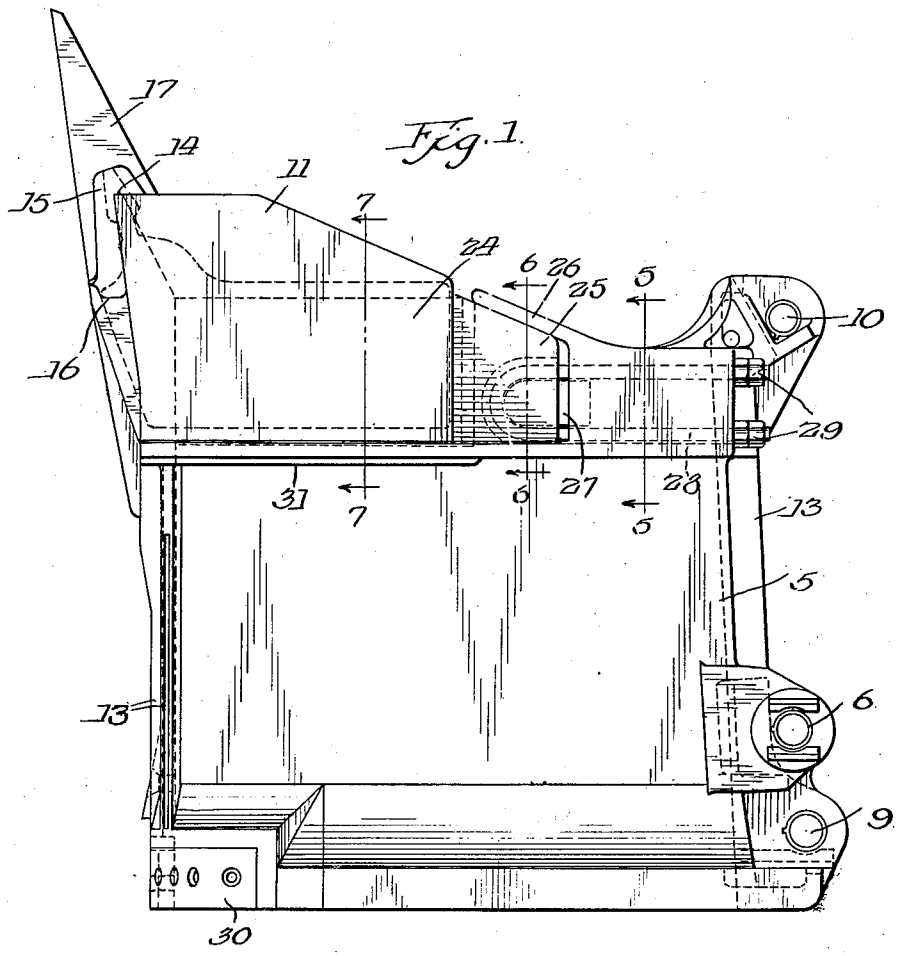
Jan. 30, 1934. J. P. MURTAUGH 1,945,064

EXCAVATING IMPLEMENT

Filed Dec. 26, 1931 3 Sheets-Sheet 1

Fig. 1.



Witness:
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Jan. 30, 1934. J. P. MURTAUGH 1,945,064

EXCAVATING IMPLEMENT

Filed Dec. 26, 1931 3 Sheets-Sheet 2

Fig. 3.

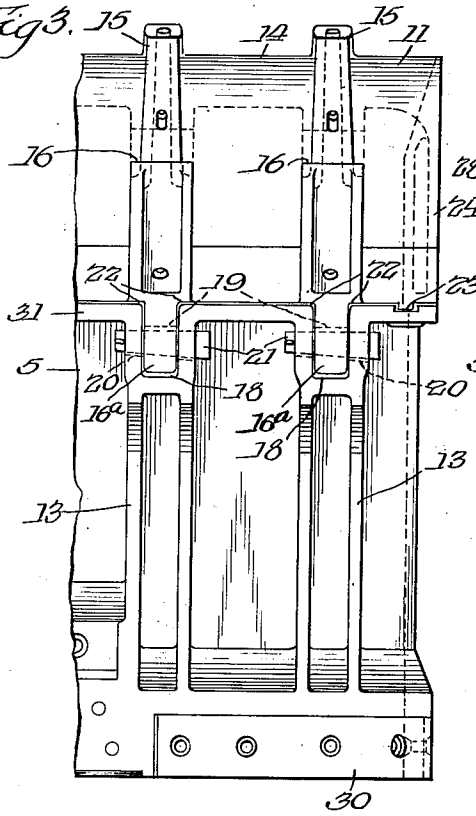


Fig. 4.

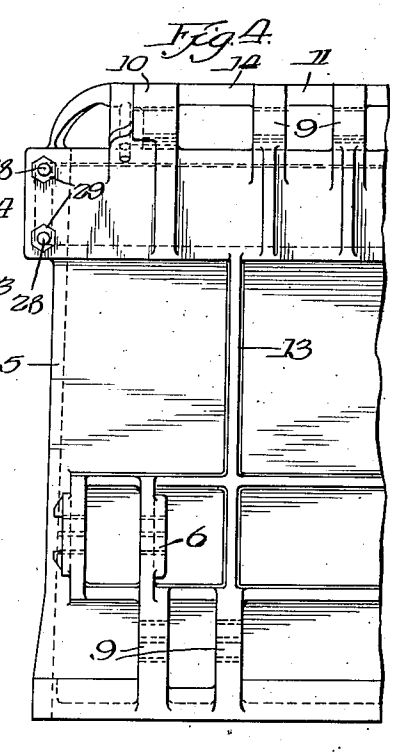


Fig. 5.

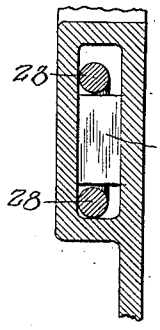


Fig. 6.

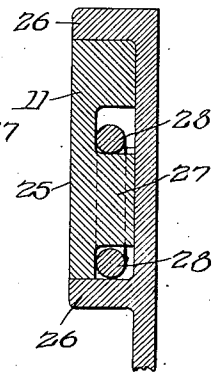
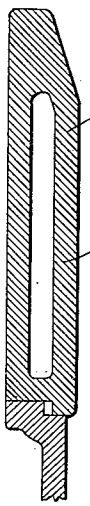


Fig. 7.



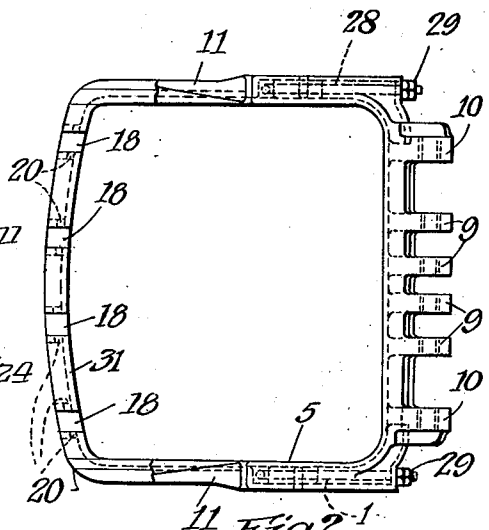


Fig. 2.

Witness:
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Jan. 30, 1934. J. P. MURTAUGH 1,945,064

EXCAVATING IMPLEMENT

Filed Dec. 26, 1931 3 Sheets-Sheet 3

Fig. 8.

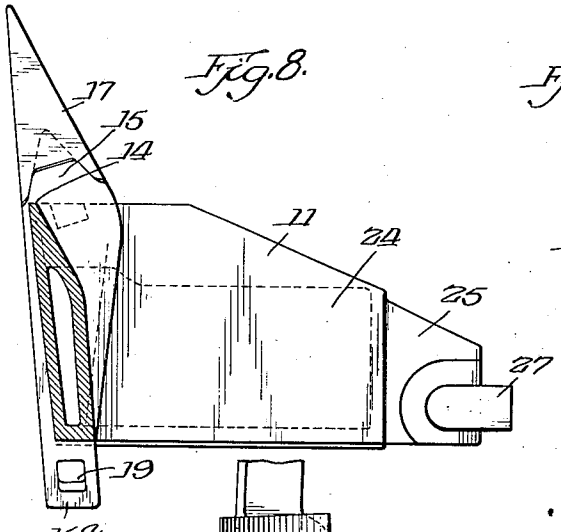


Fig. 9.

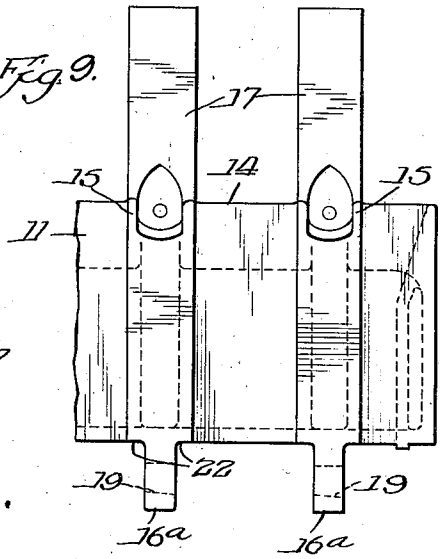


Fig. 10.

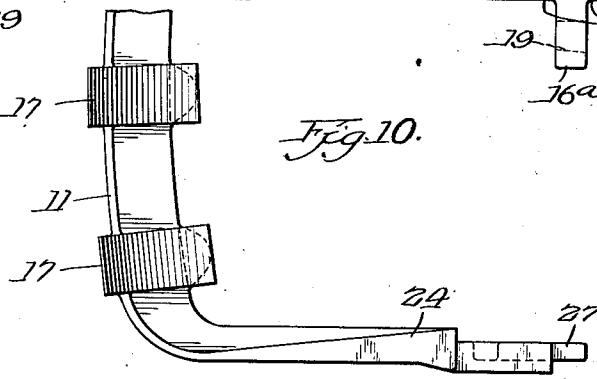


Fig. 11.

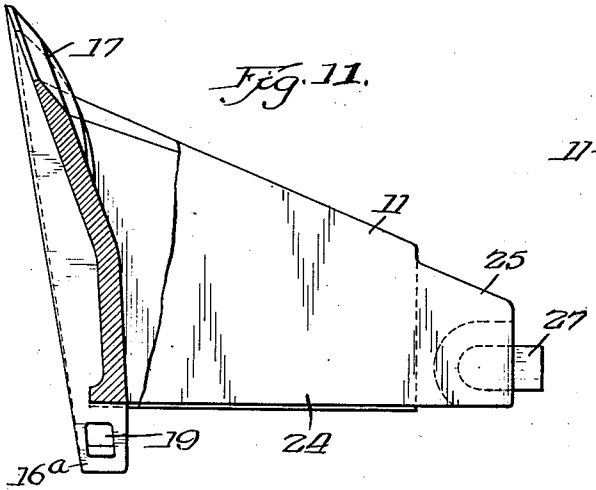
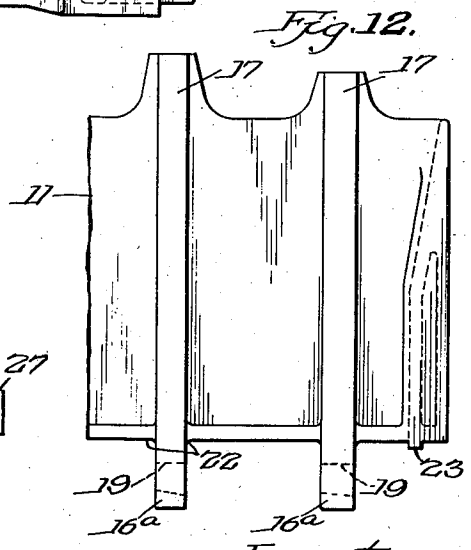


Fig. 12.



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Patented Jan. 30, 1934 1,945,064

UNITED STATES PATENT OFFICE

1,945,064

EXCAVATING IMPLEMENT

Joseph P. Murtaugh, Chicago Heights, Ill., assignor to American Manganese Steel Company, Chicago Heights, Ill., a corporation of Maine

Application December 26, 1931
Serial No. 583,317

20 Claims. (Cl. 37—141)

The present invention relates in general to excavating implements and has particular reference to power actuated dippers, buckets or the like for use in excavating and otherwise handling large quantities of earth and debris.

Briefly, the salient features of the invention reside in providing an implement of this style comprising a body portion preferably formed of a one piece casting with a separate lip member mounted thereon for convenient removal, thus making it possible for the user to adapt the implement, by interchange of lips, to different excavating requirements.

While the foregoing statement is indicative in a general way of the nature of the invention, other objects and advantages will be apparent upon a full understanding of the construction and cooperative relationship of the several parts of the implement.

One type of construction for reducing the invention to practice is presented herein by way of exemplification but it is to be understood that the invention is susceptible of embodiment in still other structural modified forms without departing from the spirit of the invention as defined by the subjoined claims.

In the accompanying drawings—

Figure 1 is a view in side elevation of a dipper illustrating the application of the invention.

Figure 2 is a top plan view of the same.

Figure 3 is a view in front elevation of a portion of the dipper.

Figure 4 is a rear elevation of a portion of the dipper.

Figure 5 is a section on the line 5—5, Figure 1.

Figure 6 is a section on the line 6—6, Figure 1.

Figure 7 is a section on the line 7—7, Figure 1.

Figure 8 is a detail section of a separable lip member for a dipper, together with an associated dipper tooth in which the digging angle is modified from the construction shown in Figure 1;

Figure 9 is a side elevation of Figure 8.

Figure 10 is a front elevation of Figure 8.

Figure 11 is a detail section of a further modification of the separable dipper lip in which the teeth are integrally formed therewith.

Figure 12 is a side elevation of Figure 11.

Referring now to the drawings in detail, 5 represents the dipper which according to one feature of the invention is constructed of a one-piece casting having integral front and back portions contributing to side, back and front walls. The back portion carries the customary bearings 6 for the hinges of a door (not shown); also the stick bearings 9 and the usual connecting ears 10. The back and upper part of the side walls of the dipper are doubled walled to add strength and rigidity to these parts as well as to facilitate the heat treatment thereof. Both the front and back walls are made with reinforcing ribs 13.

The front portion carries the lip member 11 upon which are mounted the several teeth 17. As previously stated, aside from the one-piece casting for the dipper body, the separate and interchangeable lip member is another and equally important feature of the invention. This separate lip member is shown to advantage as at 11, the same preferably comprising a one-piece casting formed to accommodate it to the shape of the dipper so as to extend across the front thereof and approximately half way along the sides.

The lip member includes dipper tooth seats 15 and shoulders 16 adjacent the seats 15 which are abutted by the dipper teeth 17. Tongues 16^a project from the lip 11 and fit into sockets 18 of the dipper casting. The tongues 16^a are formed with tapered openings 19 made to register with tapered openings 20 in the side walls of the sockets 18 for the reception of tapered or wedge-shaped keys 21, thus contributing to a detachable mounting for the lip member. The openings 19 are slightly over-size so that when the keys 21 are driven in the tapers thereof will draw the tongues into the sockets causing the shoulders 22 on the teeth mounting ribs 16 to impinge against the corners at the open ends of the sockets and bear upon the same for support. A locating rib 23 is provided on the lip member which seats in a channeled groove along the edge of the dipper body.

In addition to the above described mounting for the lip member is the detachable securing means at opposite sides of the dipper body. In this connection the opposed sides of the lip member are each preferably formed with a double walled advanced portion 24 which terminates rearwardly in a modified wedge-shaped tenon 25 made to fit within the open side mounting member 26 cast as an integral upper part of each side wall. On the inside of the wedge shaped tenon 25 is a boss or lug 27 which is embraced by the U-bolt 28. The parallel legs of the bolt 28 extend rearwardly through the hollow formed by the double wall of the mounting member 26 and project beyond the same for the reception of nuts and nut locks 29.

The lugs 27 on the ends of the detachable lip enter into pockets formed by the double wall construction of the dipper side walls as shown in

Fig. 5. The lugs 27, by cooperating with the pockets, constitute means to prevent deflection of the ends of the lip in lateral directions with respect to the side walls of the dipper. Therefore, the ends of the lip are held against spreading outwardly as well as against movement in an inward direction with respect to the dipper body caused by the digging strains upon the lip.

In securing the lip member in place, the U-bolts are first slipped over the lugs or bosses 27 so that as the lip member is located the bolts will be inserted between the double walls of the mounting member 26 to present their threaded ends in position for the reception of the nuts. When thus locating the lip member the tongues 16a will move into place in their respective sockets. When the lip member has been properly seated the nuts 29 may be turned to wedge the tenon 25 within the confine of the mounting member 26, then the keys 21 may be driven through the registering openings in the tongues and sockets. The ends of the keys may be split so that after they are driven in place they may be spread and thus prevented from working loose.

From the above it will be seen that the lip member and the teeth that it carries may be easily applied and removed without sacrificing rigidity or other qualities essential as a practical solution of the problems involved.

To further accommodate the lip member and add to the support of the same, the upper edge of the dipper body is flanged as at 31 to provide a slight overhang upon which the lip member bears. This flange extends across the front and along the sides for the entire length of the lip member.

The detail construction of the teeth and the particular manner of mounting them upon the lip member is of no special concern in the present case. The teeth and their mounting on the lip may be conventional practice or of special construction if and when desired.

The interchangeable lip member shown in Figure 1 is particularly applicable for excavating rock, while the lip member Figures 11 and 12 may be used for grading purposes.

A particular advantage of forming the side walls of the dipper with a double wall section resides in the fact that the U-shaped bolts are received between the double walls of each of the dipper side walls and are therefore protected from wear. The double wall sections of the side walls extend upwardly with respect to the dipper beyond the upper edge of the dipper front wall which constitutes a seat for the central portion of the trough shaped digging lip, and the wedge shaped pockets formed in the side walls engage the ends of the lip at a distance from the seat of the central portion of the lip upon the front wall. This arrangement provides leverage to securely hold the digging lip against rotation with respect to its seat upon the front wall caused by digging strains.

Briefly expressing the outstanding feature of the invention from the user's viewpoint it provides a power actuated dipper, or excavating implement constituting a body and a plurality of tooth-equipped accessories which are adapted for selective interchangeable application to the body, thus making one body serve several different purposes.

It will be understood that the detachable lip as described herein may be readily installed upon a dipper in the field even though there may have been some distortion of the dipper bucket through its use. It is only necessary to drop the bucket upon the lip in such a manner that the lugs 27 enter the pockets formed in the dipper side walls and the lip may then be forced into place by the power of the shovel. The lugs 16a and 17a have a free fit in the pockets 18 formed in the upper edge of the front wall. The keys 21 are then inserted to draw the central portion of the lip towards the bottom of the bucket and to bring the lip and the upper edge of the front into an abutment. The U-bolts 28 are accessible from the back of the bucket to draw the ends of the lip towards the back of the bucket and this will serve to tightly seat the wedge portions 25 on the ends of the lip in the wedge shaped sockets in the side walls of the bucket. The construction not only provides for replacement of the lip in the field without the use of rivets and within a very short period of time, but also enables a material reduction in weight of the bucket. It will be noted that the only overlap is between the lugs 27 and the side walls of the bucket, whereas in prior constructions in which the lip has been riveted, it is necessary to provide a considerable overlap and added weight.

I claim:

1. In a dipper construction, a dipper body including a dipper front and a dipper back, a substantially U-shaped replaceable digging lip adapted to be secured to said dipper front and means including members extending through and accessible from the back of said dipper for engaging the ends of said lip to secure said lip to said front.

2. In a dipper construction, a dipper body including a dipper front and a dipper back, a replaceable digging lip adapted to be secured to said digging front, said lip including side portions and threaded means engaging said side portions extending through and accessible from the back of said dipper for attaching or detaching the lip from said front.

3. In an excavating bucket construction, a bucket body, a substantially U-shaped replaceable digging lip adapted to be secured to said body, the ends of said lip and said body including wedge-shaped cooperating portions and means for holding said lip to said body and drawing said portions into wedging engagement in directions within the planes of the ends of said lip.

4. In a dipper construction, a dipper body including a dipper front and dipper side walls, a replaceable digging lip adapted to be secured to said front, said lip including side portions, the side portions of said lip and the side walls of said dipper having wedge-shaped engaging portions and threaded means for drawing the side portions of said lip into wedging engagement with the side walls of said dipper.

5. In a dipper construction, a dipper body having a dipper front and dipper side walls, a replaceable digging lip adapted to be secured to said dipper front, securing means for drawing said lip towards the bottom of said dipper body into abutting engagement with said dipper front and additional securing means for drawing the side portions of said lip into abutting relation with the side walls of said dipper in a direction transverse to the abutment of said lip upon said front.

6. In a dipper construction, a dipper body having a front wall, a back wall and side walls, a replaceable digging lip adapted to be secured to said dipper body, said lip forming an extension of said dipper front wall and having side portions extending towards said dipper back wall and means for fastening said lip to said body including means

for drawing the side portions of said lip toward said back wall.

7. In a dipper construction, a dipper body having a front wall, a back wall and side walls, a replaceable digging lip adapted to be secured to said dipper body, said lip forming an extension of said dipper front wall and having side portions extending towards said dipper back wall and means for fastening said lip to said body including means for drawing the side portions of said lip toward said back wall, said means comprising U-shaped bolting means engaging the side portions of said lip and extending through said back wall.

8. In a dipper construction, a dipper body having a front wall, a back wall and side walls, a replaceable digging lip adapted to be secured to said dipper body, said lip forming an extension of said front wall and including side portions extending toward said back wall, the dipper side walls having a double wall formation between the side portions of said lip and said back wall and means engaging said side portions of said lip and extending through said double wall formation towards the back wall for fastening said lip to said dipper body.

9. In a dipper construction, a dipper body having a front wall, a back wall and side walls, a U-shaped replaceable digging lip adapted to be secured to said dipper body and means for fastening the central portion of said lip to said dipper front wall, sockets formed on said dipper side wall adapted to receive the ends of said U-shaped lip and means engaging the ends of said lip and protruding through the back wall of said dipper for drawing the ends of said lip into seating engagement with the sockets.

10. A front construction of a dipper comprising a trough-shaped body section, a separate upper trough-shaped section, and means for preventing deflection of end portions of said upper section comprising grooves in one of said sections into which portions of the other of said sections extend, said grooves opening in the direction of the planes of the side walls of said body section.

11. A front construction of a dipper comprising a trough-shaped body section including a front wall and side walls, said side walls having portions extending upwardly beyond the upper edge of the front wall, a separate upper trough-shaped lip section adapted to be secured to said body section and connections between the ends of said lip section and the upwardly extending side portions of said body section for preventing deflection of the end portions of said lip section, said means comprising lugs on one of said sections and pockets in the other of said sections into which said lugs extend, said pockets opening in the direction of the planes of the side walls of said body section.

12. A front construction of a dipper comprising a trough-shaped body section including a front wall and side walls, said side walls having portions extending upwardly beyond the upper edge of said front wall and spaced materially from the front wall, a separate upper trough-shaped lip section, the central portion of said lip section being adapted to seat upon the front wall of said body section and the end portions of said lip section extending towards and engaging the upwardly extending side portions of said body section and means for preventing deflection of the end portions of said lip section, comprising lugs upon the end portions of said lip section substantially in the planes thereof and pockets in the side portions of said body section adapted to receive said lugs, said pockets opening in the direction of the planes of the side walls of said body section.

13. In a dipper construction, a dipper body including front, back and side walls, said side walls having portions extending upwardly beyond the upper edge of said front wall, a replaceable digging lip adapted to be secured to said dipper body, said lip being substantially U-shaped to conform to the shape of the front and side walls of said dipper body and means for holding the ends of said lip against lateral deflection with respect to the side walls of said dipper body comprising cooperating lugs and pockets on the end portions of said lip and the upwardly extending side portions of said dipper body, said lugs and pockets extending in the planes of the side walls of said dipper body to permit engagement between said lugs and pockets by assembly of the lip with respect to the dipper body by movement towards the back wall of the dipper body.

14. In a dipper construction, a dipper body including front, back and side walls, said side walls having portions extending upwardly beyond the upper edge of said front wall, a replaceable digging lip adapted to be secured to said dipper body, said lip being substantially U-shaped to conform to the shape of the front and side walls of said dipper body and means for holding the ends of said lip against lateral deflection with respect to the side walls of said dipper body comprising cooperating lugs and pockets on the end portions of said lip and the upwardly extending side portions of said dipper body, said lugs and pockets extending in the planes of the side walls of said dipper body to permit engagement between said lugs and pockets by assembly of the lip with respect to the dipper body by movement towards the back wall of the dipper body and means for securing said lip to said body by drawing the end portions of said lip towards the back wall of said dipper body to cause said lugs to enter said pockets.

15. In a dipper construction, a dipper body including front, back and side walls, a replaceable digging lip adapted to be secured to said dipper body, said lip being trough-shaped to conform to the shape of said dipper body and means for engaging the ends of said lip and said dipper body for drawing the ends of said lip towards the back wall of said dipper body.

16. In an excavating bucket construction, a bucket body including front, back and side walls, a replaceable digging lip adapted to be secured to said bucket body, said lip being trough-shaped to conform to the shape of said bucket body, the end portions of said lip and the side walls of said bucket body forming wedge-shaped cooperating portions, and means for drawing said wedge-shaped portions into tight engagement.

17. In a dipper construction, a dipper body including front, back and side walls, a replaceable digging lip adapted to be secured to said body, said lip including side portions extending towards the back wall of said dipper body, the side portions of said lip having wedge-shaped extensions, the side walls of said dipper body having wedge-shaped sockets adapted to receive the wedge-shaped extensions of said lip and means for drawing said wedge-shaped extensions into tight engagement with said sockets, said means being effective to displace said lip towards the back wall of said dipper body.

18. In a dipper construction, a dipper body in-

cluding back, front and side walls, a replaceable digging lip adapted to be secured to said dipper body, said lip being substantially U-shaped, means for drawing the ends of said lip towards the back wall of said dipper body and means for drawing the central portion of said lip into seating engagement upon the front wall of said dipper body in a direction towards the bottom of said dipper body.

19. In combination, an excavating bucket having a front wall, side walls and a back wall and a substantially trough-shaped lip section, means cooperating with the front wall of said bucket for drawing the central portion of said lip section into abutment against said front wall, the side walls of said bucket being formed to receive and house the ends of said lip section to prevent spreading thereof.

20. In combination, an excavating bucket having a front wall, side walls and a back wall and a substantially trough-shaped lip section, taper wedge means cooperating with the front wall of said bucket for drawing the central portion of said lip section into abutment against said front wall, the side walls of said bucket being formed to receive and house the ends of said lip section to prevent spreading thereof.

JOSEPH P. MURTAUGH.