June 2, 1931. W. S. McKEE 1,807,632

EXCAVATING DIPPER

Filed Feb. 3, 1928 2 Sheets-Sheet 1

Fig. 1.

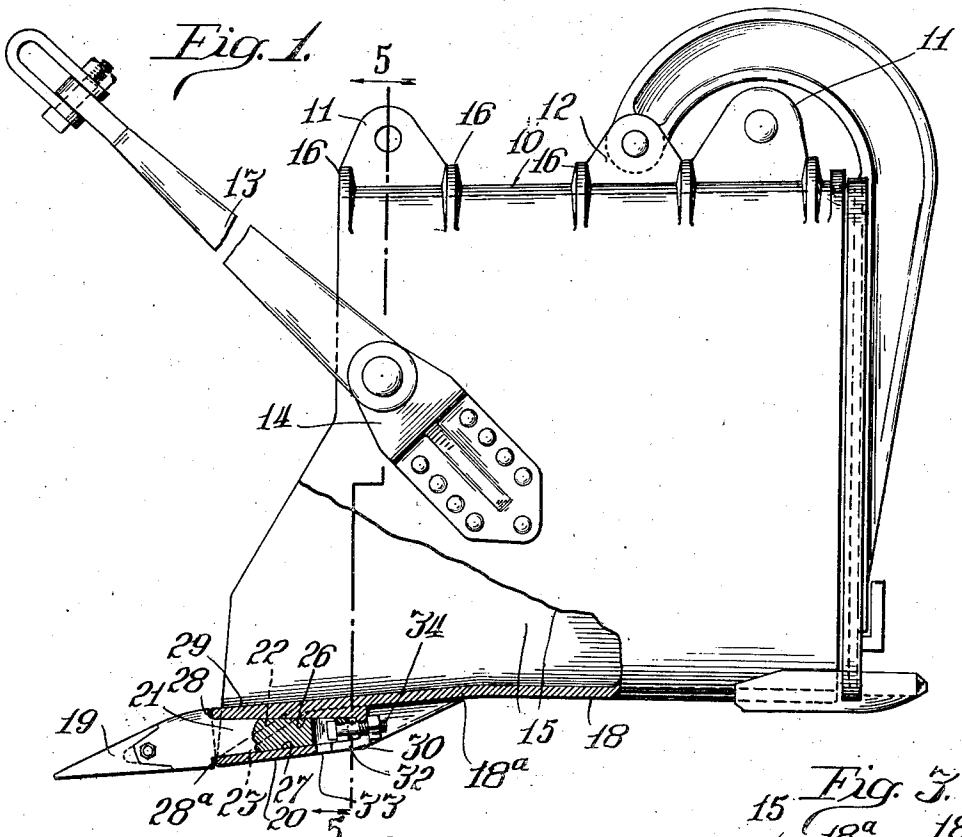


Fig. 2.

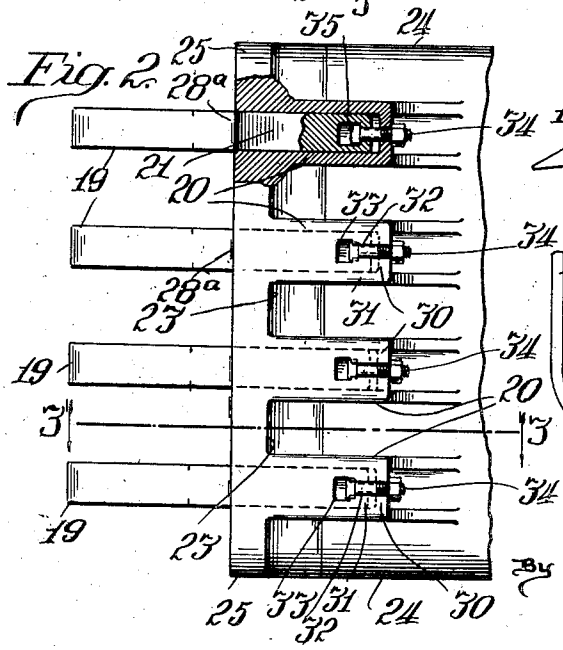


Fig. 3.

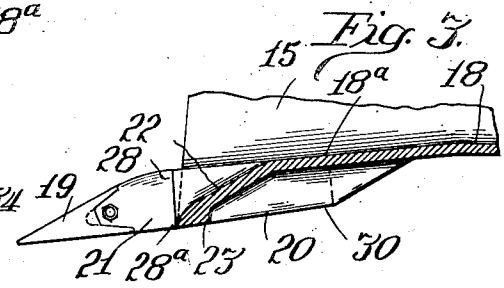
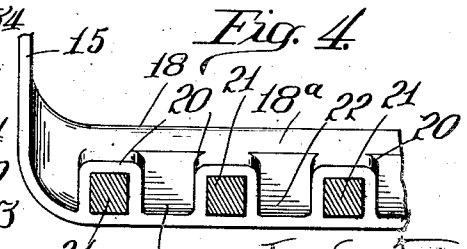


Fig. 4.



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Fig. 5.

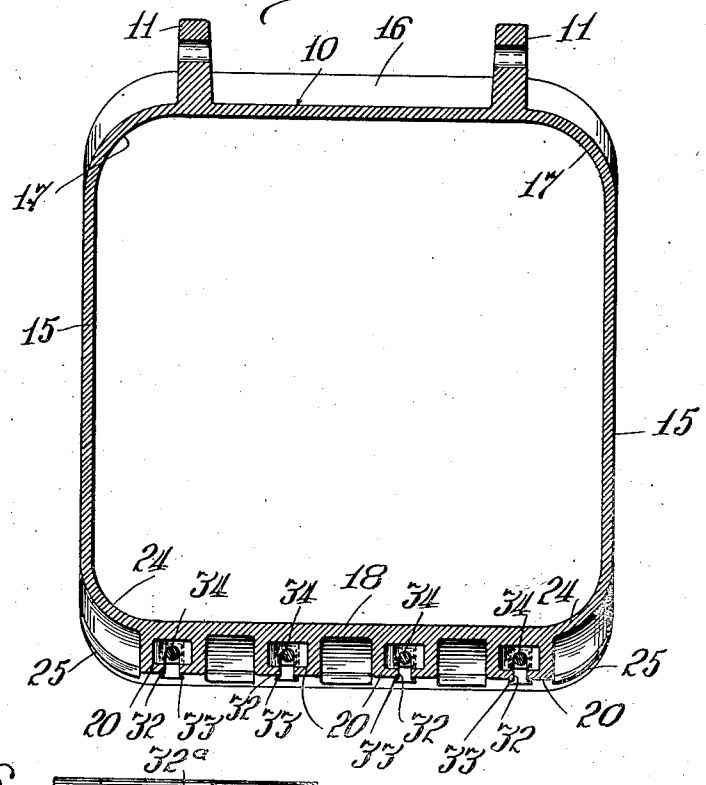


Fig. 6.

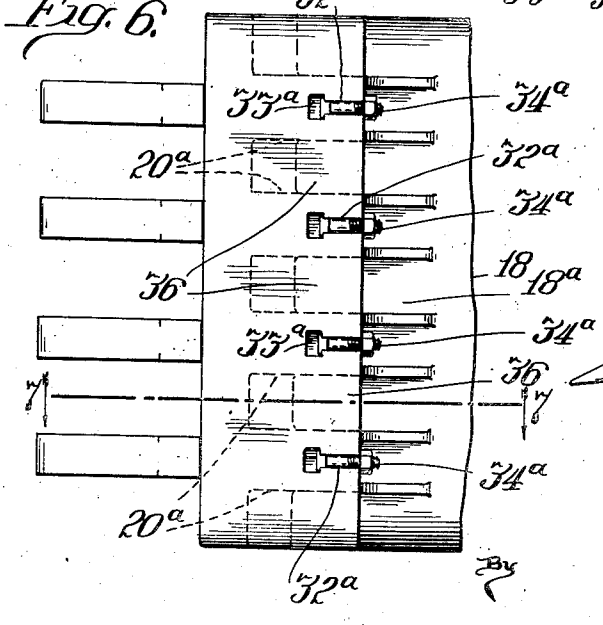
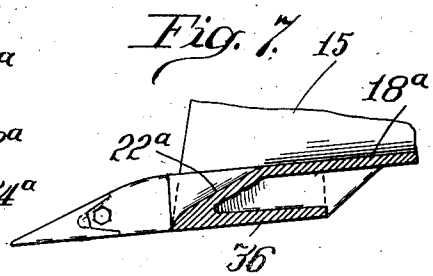


Fig. 7.



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1,807,632

UNITED STATES PATENT OFFICE

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EXCAVATING DIPPER

Application filed February 3, 1928. Serial No. 251,548.

This invention relates to excavating dippers.

It has been customary in the manufacture of excavating dippers of the general type contemplated in this application, to make the dipper body of several parts secured together with rivets. Such constructions have been objectionable in that the dipper body as a whole is weakened by the large number of rivet holes. In some constructions the front wall, to which the teeth are attached, and which is subjected to great wear and strain incident to the digging operation, has been cast in one piece and attached to the side walls of the dipper body by means of rivets or bolts. Such constructions fail in most cases, not by reason of wear, but by breaking. In practically all cases the break starts from one or more rivet holes and extends across the casting.

One of the objects of the present invention is to provide a construction for overcoming the above mentioned and other objections to the general type of dipper construction above referred to. In this connection the invention contemplates the provision of a dipper construction which will substantially eliminate the weaknesses in the constructions heretofore used, and which is so constructed as to facilitate the repairing and replacement of cooperating parts.

Another object of the invention is to provide an excavating dipper in which the dipper body is made in a single casting having a relatively smooth inner face and in which only a small number of bolts or rivets are required in connection with the attachment of associated parts to the dipper body.

Another specific object of the invention is to provide a dipper in which the front wall is reinforced along the digging edge thereof and in which said reinforcement provides sockets which so receive and support the teeth members of the dipper that the stresses incident to the digging operations are distributed more uniformly throughout the dipper body.

Another object is to provide a dipper having a front which is so formed as to make practicable the use of relatively short and light teeth members. In this connection I aim to provide a construction which will be very rigid and which at the same time will permit the teeth disposed along the digging edge of the dipper to be readily and quickly applied or removed from the dipper body without interrupting the operation of the excavating machine for any extensive period of time.

Another object is to provide an improved tooth construction, in which the several teeth are removably attached to the digging edge of the dipper body. In this connection the invention contemplates as a further object to form the base portions of the teeth with tapered sides adapted to wedgingly engage the tapered walls of the several tooth sockets.

Another object is to provide a construction whereby separable attaching means may be employed and arranged in such position as to exert force in a direction to increase the wedging engagement of the base portion of the teeth with the walls of the sockets.

The invention has for further objects such other new and improved constructions, arrangements and combinations of parts and devices hereinafter described and claimed for carrying out the above stated objects and such other objects as will appear from a detailed description of the embodiments shown in the accompanying drawings.

The invention is illustrated in two specific embodiments in the acompanying drawings wherein:

Fig. 1 is a side view partly in section and partly in elevation of an excavating dipper made in accordance with my invention.

Fig. 2 is a fragmentary view partly in elevation and partly in section illustrating the outside face of the front wall adjacent the digging edge thereof.

Fig. 3 is a sectional view taken on line 3—3 of Fig. 2.

Fig. 4 is a fragmentary end view of the digging edge of the dipper body.

Fig. 5 is a cross sectional view taken on line 5—5 of the dipper shown in Fig. 1.

Fig. 6 is a view similar to Fig. 2 illustrating a modified construction, and

Fig. 7 is a cross sectional view taken on line 7—7 of Fig. 6.

In the embodiment illustrated in Figs. 1 to 5 inclusive of the drawings, the body portion of the dipper is preferably cast in one piece. While the one piece construction is preferred, various portions of the invention can be used to advantage in the construction of dipper bodies made up of a plurality of castings or partly of castings and partly of plate steel. It will be understood, therefore, that the various features of the invention are not to be the movable beam (not shown) of an except insofar as such limitations may be stated in the appended claims.

The rear side 10 of the dipper body is formed with lugs 11—11 for attachment to the movable beam (not shown) of the excavating machine. The rear side is formed also with suitable lugs 12 to which is attached the hinged bottom of the dipper. The bail 13 is pivotally attached to ears 14 riveted to opposite side walls 15—15 of the dipper body. The rear wall is reinforced by ribs 16 which extend across the wall on the outside thereof and extend also around the preferably curved corner portions 17—17 of the body.

The front wall 18 is illustrated in the drawing as having an outwardly flared portion 18*a* extending substantially from the middle of the dipper front to the digging edge thereof so as to insure that the teeth 19 will assume the proper "rake" or digging angle when the dipper is forced into a bank. While I have shown an outwardly flared dipper front as a preferred construction, it will be obvious that the front wall can be made straight from the digging edge to the bottom, if such construction is desired. The said front wall has a smooth inner surface and is formed along the digging edge with a plurality of hollow reinforcements 20, each of which provides a socket adapted to receive the base portion 21 of one of the teeth 19 disposed along the digging edge of the dipper body. The marginal portion 22 of the front wall is further flared outwardly at opposite sides of each tooth socket so as to provide a moderately sharp digging edge at opposite sides of each tooth base 21. The diagonal position of the portion 22 of the end wall relative to the hollow sockets for the teeth provide a rigid marginal reinforcement. The upper edge of each flared portion 22 terminates in an enlargement or flange 23 the extremities 25 of which extend around and reinforce the curved corner portions 24—24 of the dipper body.

The said extremities 25—25 of the flange 23 taper in thickness and merge into the side walls 15—15 of the body as shown best in Fig. 5. The opposite walls 26 and 27 of each tooth socket converge toward the end of the socket so as to provide tapered walls which have a wedging engagement with correspondingly tapered sides of the tooth base 21. Each said tooth base is formed with shoulders 28, 28*a* which preferably stand slightly away from the edge of its socket so as to permit such adjustment of the tooth in the socket as will insure a tight wedging engagement of the tapered sides of the tooth base with the tapered walls of the tooth socket. The edge of the shoulder 28 aligns with the inner face 29 of the portion 18*a* of the front wall. The outside surface of the dipper front is smooth on lines extending from the digging edge of the body to the bottom and is smooth transversely of the body except for the sinuous configuration of the marginal enforcement. The end 30 and one side 31 of each tooth socket is formed with a slot 32, the upper end 33 of which is large enough to permit the head of a clamping bolt 34 to be passed through, while the other portion of the slot is of sufficient size only to receive the shank of said bolt. The end of each tooth base is formed with a similar slot 35 adapted to engage with the slot 33 formed in the tooth socket. When the slot 35 of the tooth base is in register with the portion 33 of the slot 32, the bolt may be inserted in the position shown in Fig. 1 and tightened therein so as to force the tooth base 21 into tight wedging engagement with the socket. It will be perceived that with the tooth base firmly wedged in the socket, the stresses incident to the digging operation will be distributed uniformly throughout the reinforced marginal portion of the dipper and throughout the entire dipper body. It will also be observed that the tooth base is relatively short with respect to the length of the front wall and can be easily handled by workmen in making field repairs or replacement of parts. The use of the clamp 34 instead of threading the bolt into the tooth base, eliminates expensive repairs in the event of the bolt being broken or the threads stripped. Furthermore, the registered slots 32 and 35 provide a convenient arrangement whereby a bar may be inserted in the slot and the tooth base driven out of the socket without marring the wedging surfaces or the threaded clamping member.

The embodiment of the invention shown in Figs. 6 and 7 may be substantially the same as the embodiment previously described except in that the outer walls of the tooth sockets are extended across the spaces between the several tooth sockets so as to provide reinforcing flanges 36 between the adjacent sockets. These flanges are spaced from and are preferably parallel with the portion 18*a* of the inner wall of the dipper body and form, together with the outer walls of said sockets, a double wall construction which extends the full length of the digging edge of the dipper and around the curved corner portions 24 of the dipper body. The portions of the said outer wall or flange which extend around the curved corner portions 24, preferably merge

into the side walls of the dipper in the same manner as the extremities 25—25 of flange 23 (see Fig. 5) merge into the side walls. In other respects, the modified embodiment may be and preferably is the same in construction as the embodiments shown in Figs. 1 to 5 inclusive.

I claim:

1. An excavating dipper having a front wall formed along its digging edge with sockets, each adapted to receive the base portion of a removable tooth member; the end of the socket farthest from the digging edge being formed with longitudinal and transverse slots adapted to receive a clamping bolt to secure said tooth base in said socket.

2. An excavating dipper having a front wall formed along its digging edge with sockets, each adapted to receive the base portion of a removable tooth member; the end of the socket farthest from the digging edge being formed with longitudinal and transverse slots and the adjacent end of the tooth being formed with corresponding slots whereby a tooth base may be inserted in said socket and a clamping bolt then inserted through said slots into position to secure said tooth base in said socket.

3. An excavating dipper having a front wall formed along its digging edge with sockets, each adapted to receive the base portion of a removable tooth member; the end of the socket farthest from the said digging edge being formed with longitudinal and transverse slots and the adjacent end of the tooth base being formed with corresponding slots whereby when a tooth base is in its wedged position in said socket, an implement may be inserted in said slot to force said tooth base out of said socket.

4. An excavating dipper, the front wall of which is formed along the digging edge with a plurality of hollow sockets spaced with relation to each other, each adapted to receive the base portion of a removable tooth member, the upper portion of said wall being flared outwardly at a predetermined angle to a point near the digging edge thereof and the portion of the wall from said point to the digging edge being flared outwardly between said tooth sockets at a greater angle so as to provide a recess of varying depths between each pair of said sockets.

5. An excavating dipper comprising a unitary cost body formed along the digging edge of the front wall with a plurality of hollow sockets for the reception of removable tooth members, the upper portion of said front wall being flared outwardly at an angle parallel to the axes of said tooth sockets and the marginal portion of said front wall being flared outwardly between said sockets at an angle to the longitudinal axes of said sockets so as to provide an open recess between each pair of sockets.

6. An excavating dipper comprising a unitary front wall made of cast metal and formed with hollow longitudinal reinforcements disposed in spaced relation to each other along the digging edge thereof and providing sockets for the reception of tooth base members, the marginal portion of the dipper edge intervening between each pair of said sockets being flared outwardly to provide open recesses of varying depths along the digging edge of the dipper and to provide also reinforcing webs which extend diagonally across the side walls of said hollow socket portions.

7. An excavating dipper comprising a unitary cast body formed with hollow sockets disposed in spaced relation to each other along the digging edge thereof and adapted to receive the base portions of removable tooth members, the marginal portion of the digging edge of said dipper being flared outwardly between each pair of sockets to provide an open recess extending to said digging edge, and reinforcing flanges spaced from the front wall of the dipper body and extending across the spaces between said sockets, whereby the marginal portion of the digging edge of said dipper has a double walled construction.

WALTER S. McKEE.

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CERTIFICATE OF CORRECTION.

Patent No. 1,807,632. Granted June 2, 1931, to

WALTER S. McKEE.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, line 13, strike out "the movable beam (not shown) of an" and insert instead construed as limited to a one-piece body,; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 7th day of July, A. D. 1931.

M. J. Moore,
Acting Commissioner of Patents.

(Seal)