

June 2, 1925.

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J. O'F. CLARK

POCKETED BOTTOM FOR EXCAVATING DIPPERS

Filed June 19, 1924

2 Sheets-Sheet 1

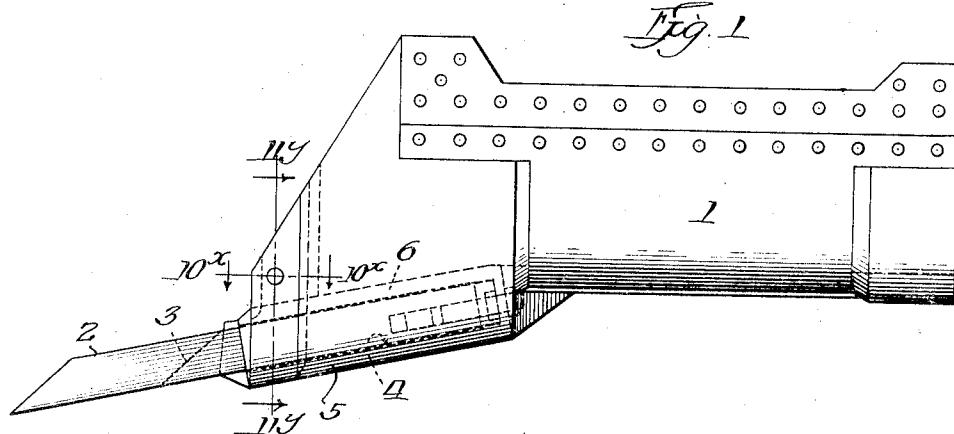


Fig. 2

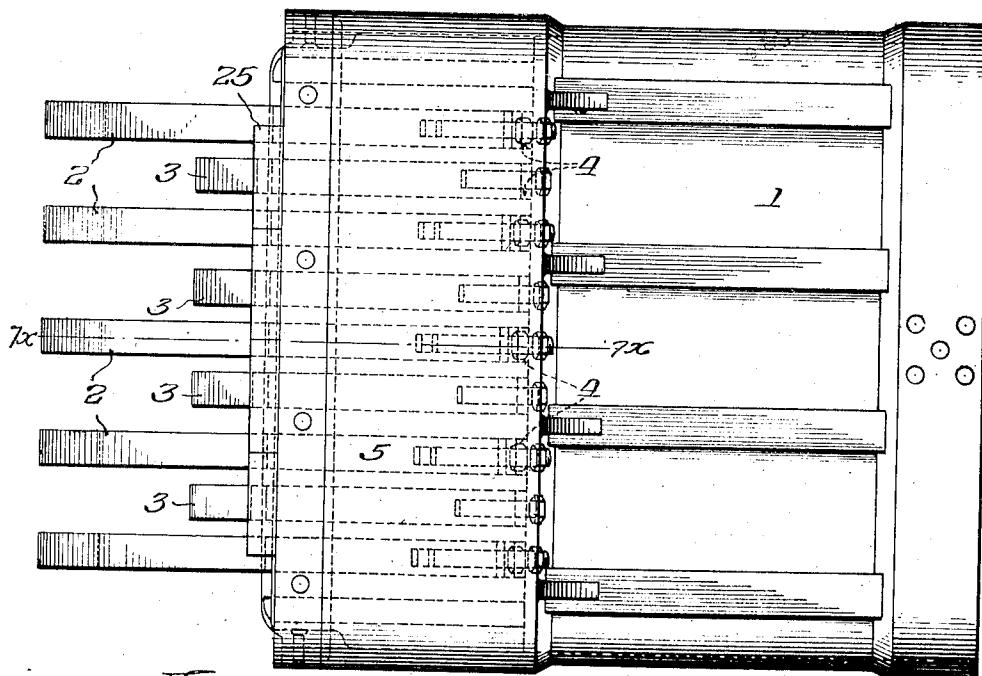
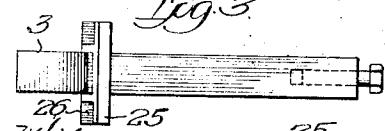
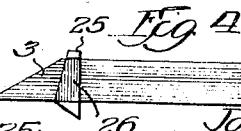


Fig. 3



Witness:

Ed. Johnson



Inventor
John O'Fallon Clark
Fig. 5 by Wilkinson, Husley, Byron & Knight
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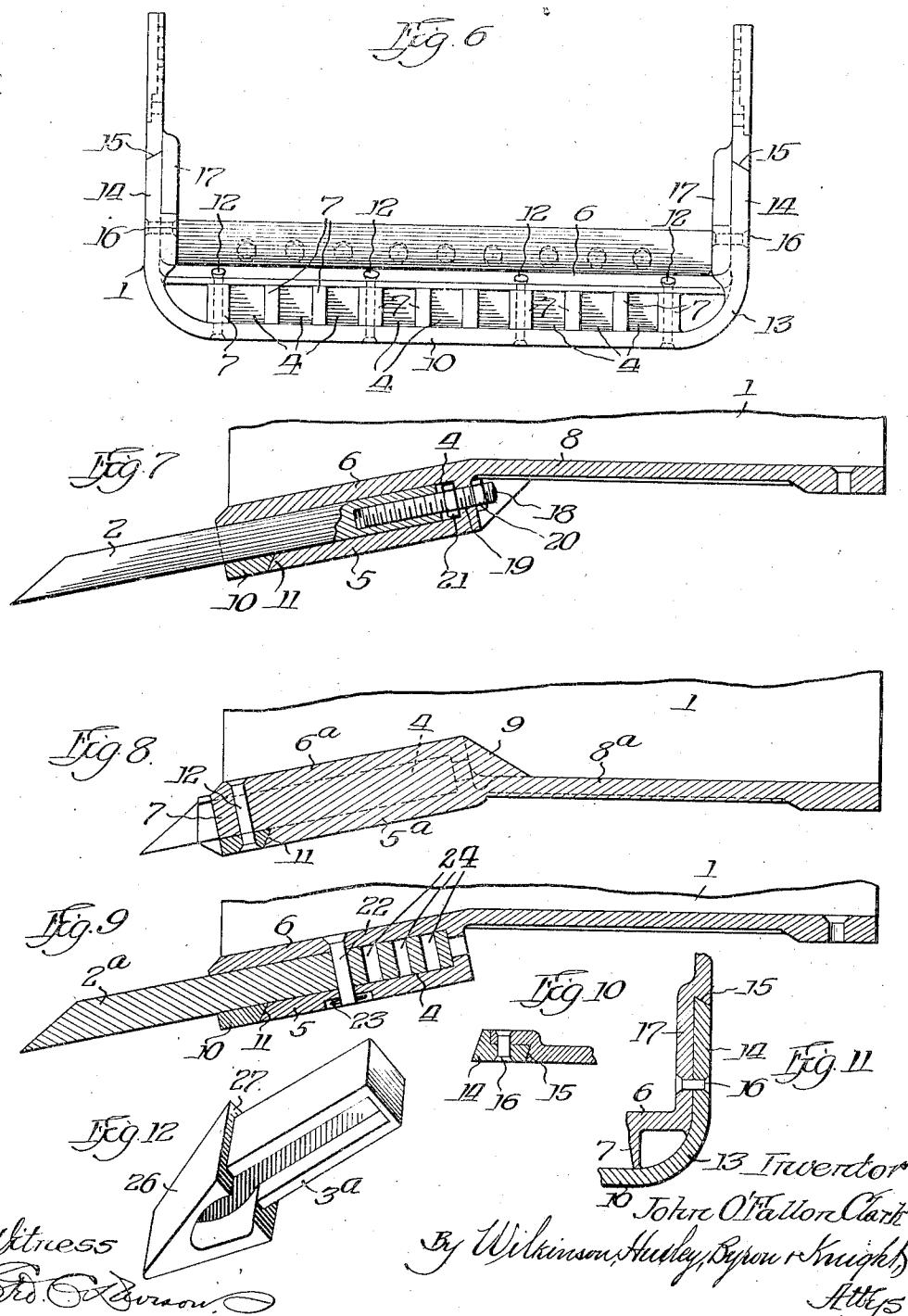
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2 Sheets-Sheet 2



Patented June 2, 1925.

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UNITED STATES PATENT OFFICE.

JOHN O'FALLON CLARK, OF CHICAGO HEIGHTS, ILLINOIS, ASSIGNOR TO AMERICAN MANGANESE STEEL COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF MAINE.

POCKETED BOTTOM FOR EXCAVATING DIPPERS.

Application filed June 19, 1924. Serial No. 720,895.

To all whom it may concern:

Be it known that I, JOHN O'FALLON CLARK, a citizen of the United States, residing at Chicago Heights, in the county of 5 Cook and State of Illinois, have invented certain new and useful Improvements in Pocketed Bottoms for Excavating Dippers, of which the following is a specification.

This invention relates to dippers or other 10 like excavating receptacles employed for gathering and removing earth, gravel, or other mineral matter in different conditions of subdivision, and employing teeth for releasing the material to be gathered sufficiently to permit it to pass into the dipper; and particularly dippers, or the like, which 15 are provided with pocket-like seats or holders in which the teeth are releasably held in order that they can be renewed when 20 worn out.

One object of the present invention is to provide a construction for the front or bottom portion of an excavating dipper which will not only provide pockets or openings 25 into which teeth may be releasably mounted, but which will utilize the pocket construction as a strengthening element in the construction of the dipper; to which end, one feature of the invention consists in providing 30 for the top and bottom walls or confines of the pockets, continuous sections of metal extending from side to side of the dipper in a manner to better enable the dipper to withstand forces which it encounters in use, and providing for the lateral confines of the 35 pockets, spacing members between the transverse sections which stand in relation to the latter as strut members in a truss or bridging construction.

Another object of the invention is to design 40 a dipper or the like with a forward lip or pick-up portion which will be better adapted for efficient stripping operation, in that it will have a substantially flat form as 45 distinguished from the inverted arch form heretofore regarded as indispensable in an implement of this kind designed for heavy duty with rough, coarse material; to which end, another feature of the invention consists 50 in forming the top and bottom continuous bridging walls of the penetrating lip on substantially straight lines, but spaced apart by strutting members largely integral therewith, so that the bridging walls of the

penetrating lip will be placed, respectively, 55 under tension and compression, by transverse stresses which they encounter in use, and thus sustain each other, notwithstanding the substantially flat or straight line form with which they are designed.

Another object of the invention is to provide a renewable wearing lip on the penetrating portion of an implement of the kind described, in order that the implement may 60 be restored to serviceable condition and prolong its service at a slight expenditure compared with the value of the whole structure; also to utilize this renewable lip in a manner to enable it to serve as a part of the trussing structure, and also to receive, as a 65 replaceable member, the erosion incident to use at those places in the implement where such depreciation is greatest; and, to these ends, further features of the invention 70 consist in making the forward portion of the lower or outer wall of the trussed excavating lip of a renewable strip fitted to substantially conform with the external 75 lines of the permanent portion of said wall, meeting the latter in a manner to firmly seat 80 against and be supported by it in withstanding the forces which the implement encounters in use, firmly riveted or otherwise held to the trussed structure in a manner 85 to lend its support thereto, and continuing around the corners and a suitable distance 90 up the sides of the body of the implement at the front margin thereof so that it takes the corner and side wear incident to the scraping of the implement over portions of the material which remain in place during 95 the movement of the dipper or implement.

A further object is to combine with a dipper or other implement having a trussed or pocketed penetrating lip, a special form 100 of tooth, particularly in the intervals between the main penetrating teeth, which special form of tooth is adapted to protect the forward margins of the pocket walls or trussing members from erosion or other destructive influences during the use of the implement; to which end, further features of the invention consist in providing teeth having not only shanks which adapt them for application to a dipper or other excavating implement by insertion into pockets designed to receive them, but having shoulders, flanges, or other transverse enlarge- 105

ments immediately forward of the ends of the pockets, preferably seating longitudinally against said forward edges of the pocket walls, but in any event serving as effective deflectors for the material passing the teeth, and preventing the same from coming in contact with said edges; said shoulder or enlargement being designed, in some instances, so that it embraces or surrounds the shank of an adjacent tooth, and, meeting with a similar surrounding and embracing enlargement from the other side of the embraced tooth, forms effective protection for forward edges of the pocket in which the latter tooth is mounted; and still another feature of the invention resides in a tooth constructed to function as here stated.

In order that the invention may be fully understood, the preferred embodiment thereof, with some modified embodiments of some of its features, will now be described in connection with the accompanying drawings, in which—

Figure 1 is a side elevation of a portion of a dipper or other excavating implement, generally referred to as the front or bottom of the implement, such implement being commonly made in sections riveted together.

Figure 2 is a bottom plan view of the same.

Figures 3, 4, and 5, are, respectively, a plan view, a side elevation, and an end view of one form of a shouldered or collared tooth intended for use in an implement embodying other features of the present invention, particularly as a form for the teeth that are located intermediately of the main penetrating teeth.

Figure 6 is a front view of the dipper member shown in Figures 1 and 2, but with the teeth omitted therefrom.

Figure 7 is a section on the line 7^x—7^x of Figure 2.

Figure 8 is a longitudinal section showing a modified construction.

Figure 9 is a view similar to Figure 7, but with a modified construction of long tooth shank for rendering the tooth adjustable.

Figure 10 is a section on the line 10^x—10^x of Figure 1.

Figure 11 is a section on the line 11^x—11^x of Figure 1; and

Figure 12 is a perspective view of a modified construction of shouldered tooth.

1 represents a portion of a dipper or other excavating implement usually constructed in sections riveted together, such portion being generally referred to as the front or bottom according to the normal position of the implement when in use. 2 represents excavating teeth with which such implements are commonly equipped, and 3 represents guard teeth of relatively shorter length generally used intermediately of the excavat-

ing teeth for the purpose of displacing such material as may pass between the excavating teeth.

According to the present invention, the teeth 2 and 3 are mounted on the member 1 through the medium of pockets 4 constructed of outer and inner walls 5 and 6 and intermediate partition walls 7 integrally uniting the outer and inner walls in spaced relation, and forming with said outer and inner walls a trussed structure which is very much more efficient in withstanding transverse stresses, and therefore admits of very much flatter design of forward lip than where a single thickness of wall is employed, besides offering a superior method of releasably mounting the teeth with which the implement is equipped. The inner wall 6 may either merge with the wall 8 of the dipper section, as shown in Figures 1, 7 and 9, or it may be inwardly offset therefrom, as shown at 6^a in Figure 8, so that the outer wall 5^a merges with the wall 8^a of the dipper section. Bracing webs 9, or 9^a located in rear of some of the partition walls 7 and integrally uniting the offset portion of the pocket with the dipper wall 8, or 8^a, may be provided for strengthening the union of the trussed digging portion of the implement to the side wall thereof.

In order to prolong the life of the digging portion of the implement, and particularly the outer wall 5 or 5^a thereof, the forward margin of said outer wall is composed of a replaceable lip 10 seating against the outer wall through the medium of undercut surfaces 11 and held in position by means of rivets 12 which pass through the replaceable lip at suitable intervals, together with the inner wall 6 or 6^a and intervening partition walls 7.

In the preferred embodiment of the invention, the replaceable wearing lip 10 extends not only across the outer surface of the digging portion of the implement, but around the corners 13 and up the sides 14, where it terminates in undercut recesses 15 formed in the body of the implement; and said side portions 14 may be additionally secured by means of rivets 16 passing through them and through the offsets 17 in the body portion. By this construction, all that portion of the implement which encounters the greatest wear in use is rendered replaceable, and the replaceable part is held to the implement very securely.

Teeth 2 may be held against displacement from their pockets 4 in various ways. According to Figure 7, each excavating tooth is provided with an adjustable shank 18 threaded into the tooth so as to change its length, and these shanks are passed through openings 19 in the rear ends of the pockets and there secured by jamb nuts 20, 21. With this arrangement, as the teeth 2 become

shortened through wear, they may be moved forward and held in various positions in their pockets, thus greatly lengthening the life of a tooth without sacrificing efficiency by constantly receding worn off parts.

According to Figure 9, excavating teeth 2^a are held in their pockets 4 by means of pins 22 passed through the teeth and the inner and outer walls of the pockets, and there secured by means of cotter pins 23 or other suitable means; and in order that the teeth 2^a may be adjusted as they wear away and keep their penetrating ends approximately in right position, each tooth 15 is provided with a plurality of pin receiving holes 24.

As shown in Figures 1 to 5 inclusive, intermediate guard teeth 3 may be provided with enlargements or shoulders 25 through 20 which they seat against and overlie the forward edges of the outer and inner pocket-forming walls 5 and 6 as well as the partition wall 7, and these enlargements may be provided with recesses 26 through which they 25 receive and embrace adjacent penetrating teeth 2, the transverse dimension of the enlargement being such that it will embrace about one half the thickness of the tooth 2 and meet with a similar enlargement of 30 a guard tooth on the opposite side of the penetrating tooth, so that the edges of the pocket walls which receive the penetrating teeth are likewise protected.

If desired, the intermediate teeth with 35 protecting shoulders may be constructed as shown in Figure 12, where the head 26, of wedge form, has its base designed to provide an abutting shoulder 27 that seats against the forward edges of the walls that 40 define the pocket that receives such a tooth.

In both the forms of protecting tooth 3 (Figures 1 to 5) and 3^a (Figure 12) the rearwardly presented seating face or shoulder, being received by the renewable lip 10, 45 imparts rearward thrust to said lip, which is sustained by the undercut seat 11 of the lip.

I claim:

1. A toothed excavating implement having upon its digging portion tooth-receiving pockets constructed of outer and inner walls, and partition walls spacing said outer and inner walls apart and uniting them into a trussed structure.

2. An excavating implement having its penetrating portion constructed with outer and inner walls extending from side to side of the implement forming the outer and inner confines of tooth pockets, and partition walls located at intervals between said outer and inner walls, integrally uniting the lips together and forming therewith a trussed structure.

3. In an excavating implement, a digging portion extending substantially straight

from side to side of the implement, and comprising outer and inner walls extending in said direction, and transverse partition walls located at intervals between the walls first named and integrally uniting same together in a trussed structure, while forming therewith pockets for the reception of teeth.

4. In an excavating implement, a penetrating portion having pockets to receive 75 teeth, said pockets having their inner and outer walls formed in common by continuous walls extending from side to side of the implement and having their side walls formed by partitioning members spacing 80 the outer and inner walls apart, and integrally uniting them to form a trussed structure.

5. In an excavating implement, a penetrating portion constructed of outer and 85 inner walls extending from side to side of the implement and having edges jointly defining the forward margin of the implement, and teeth confined between said walls and having shoulders abutting against said edges 90 thereof.

6. In an excavating implement, a pocketed digging portion constructed of spaced outer and inner walls extending transversely of the implement; one of said walls being constructed with a replaceable lip.

7. In an excavating implement, a pocketed digging portion constructed of spaced outer and inner walls extending transversely of the implement; one of said walls being constructed with a replaceable lip extending around the corners of the implement.

8. In an excavating implement, a pocketed digging portion constructed of spaced outer and inner walls extending transversely of the implement; one of said walls being constructed with a replaceable lip extending around the corners of the implement and up the sides thereof.

9. In an excavating implement, a pocketed digging portion constructed of spaced outer and inner walls extending transversely of the implement; one of said walls being constructed with a replaceable lip extending around the corners of the implement and seating rearwardly against the wall of which it forms a part through means of undercut faces.

10. In an excavating implement, a pocketed digging portion constructed of spaced outer and inner walls extending transversely of the implement; one of said walls being constructed with a replaceable lip extending around the corners of the implement and up the sides thereof; said lip seating against the wall of which it forms a part as well as against the sides of the implement through the medium of undercut faces.

11. In a toothed excavating implement, a penetrating portion constructed of outer and inner spaced walls forming confines of tooth receiving pockets; the outer wall having a renewable lip portion seating rearwardly against it; and said implement having teeth constructed with shoulders through which they seat rearwardly against said lip.

10 12. An excavating implement having a pocketed penetrating portion constructed of outer and inner transverse walls and intervening partition walls spacing said transverse walls apart and forming therewith tooth receiving pockets; the outer wall being constructed with a replaceable lip; and said lip having means for securing it in place, passing through the lip and the opposed transverse wall and through intervening partition walls.

15 13. In an excavating implement, a pocketed penetrating portion, and teeth adapted to pockets in said portion, some of the teeth being constructed with enlargements through which they seat rearwardly against the ends of the pockets that receive them, and said enlargements extending laterally to embrace adjacent teeth and to overlie the ends of the pockets of said adjacent teeth.

20 14. In a front for dippers and like excavating implements, a penetrating portion constructed of spaced outer and inner walls extending sidewise of the implement, and a series of strutting members located between and uniting and forming with said outer and inner walls a truss in the structure of said penetrating portion.

25 15. In a front for dippers and like excavating implements, inner and outer walls extending sidewise of the implement, adjacent the penetrating portion of the implement, and a series of strutting members extending longitudinally of the implement, offsetting one of said walls from the other and uniting with said walls to form a truss.

30 16. In a front for dippers and like excavating implements, inner and outer walls extending sidewise of the implement, adjacent the penetrating portion of the implement, a series of strutting members extending longitudinally of the implement, offsetting one of said walls from the other and uniting with said walls to form a truss, and bracing webs in line with strutting walls, in rear of the offset wall.

Signed at Chicago Hgts, Illinois, this 13th day of June, 1924.

JOHN O'FALLON CLARK.