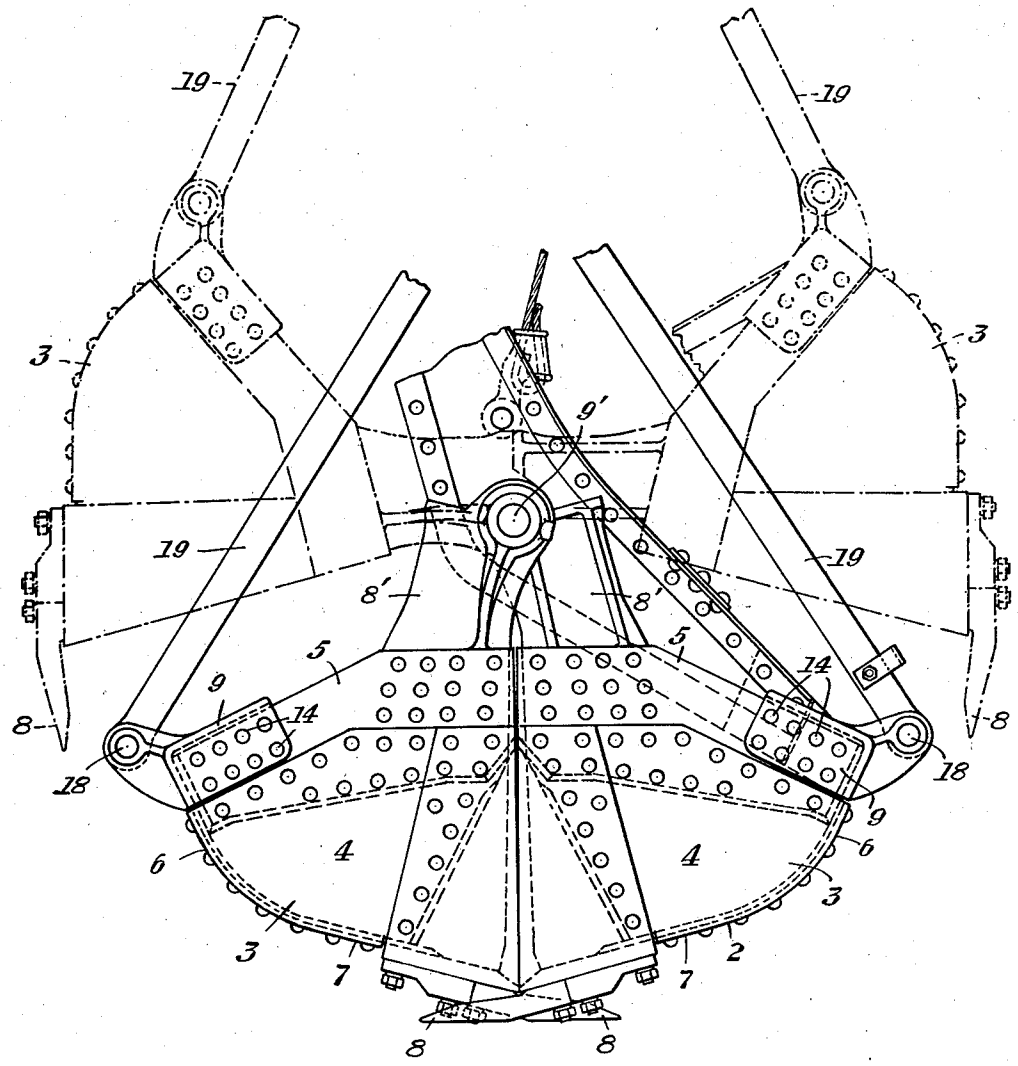
June 6, 1939. G. J. EHRHARDT 2,161,147

CLAMSHELL BUCKET AND CORNER BRACKET THEREFOR

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Fig. 1.



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Fig. 2.

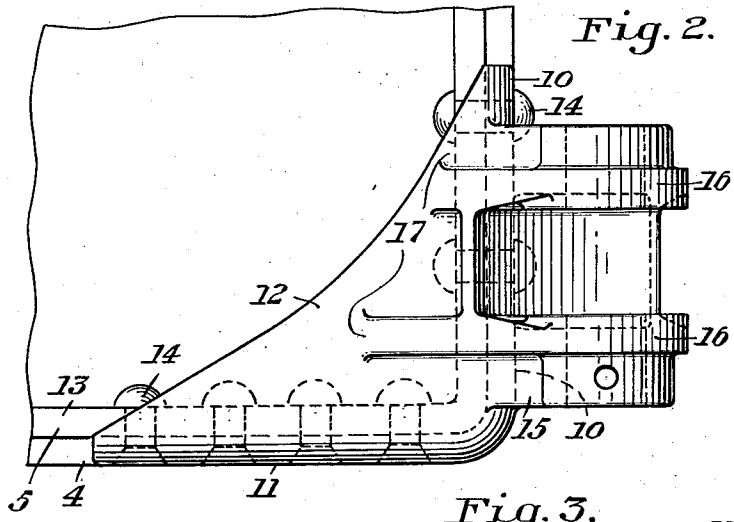


Fig. 3.

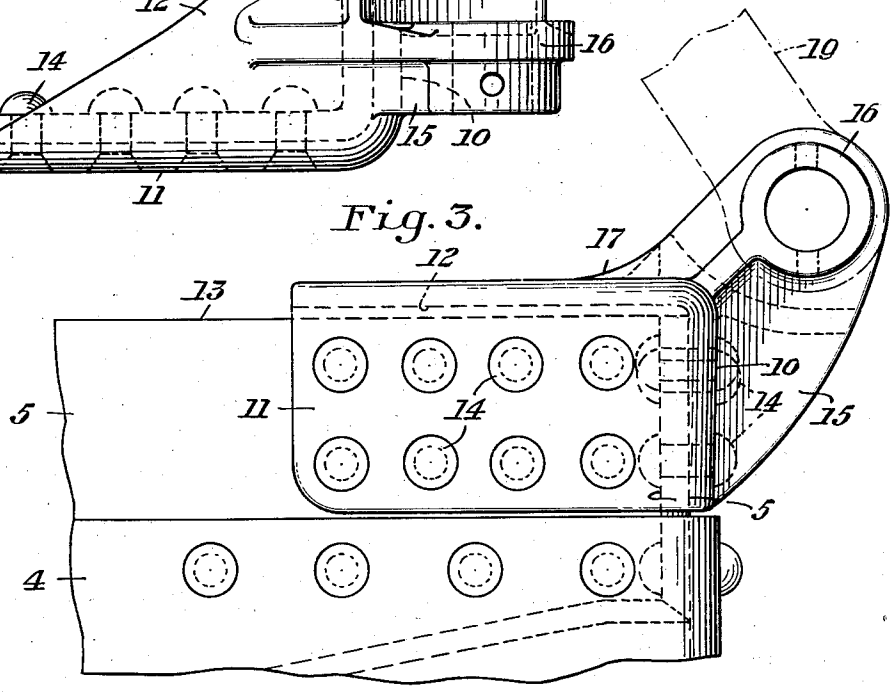
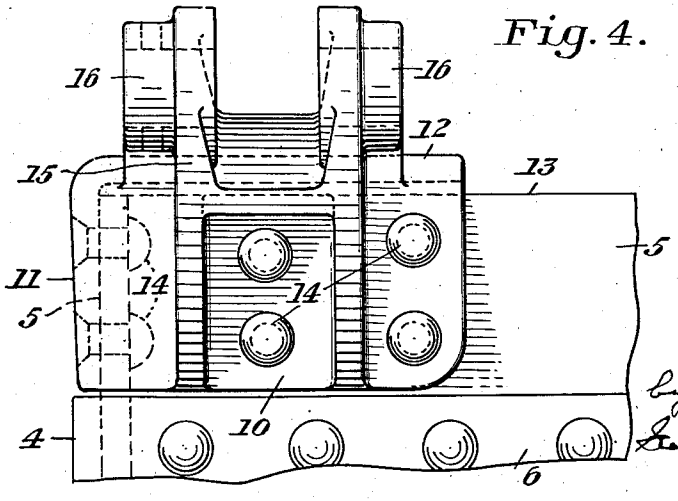


Fig. 4.



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Patented June 6, 1939 2,161,147

UNITED STATES PATENT OFFICE

2,161,147

CLAMSHELL BUCKET AND CORNER BRACKET THEREFOR

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Application January 25, 1939, Serial No. 252,780

10 Claims. (Cl. 37—184)

This invention relates to a clamshell bucket and a corner bracket therefor. The field in which clamshell buckets are used has been greatly broadened in recent years. Originally clamshell buckets were simply used for moving loose material, but they have more recently come into wide use for excavating and digging, which requires a stronger construction and a more powerful closing action.

The construction of the clamshell bucket corner brackets and the manner of attachment thereof to the bucket is of great importance in the designing and building of clamshell bucket structures, as the bucket members or scoops are operated by corner bars which are connected therewith through the corner brackets. Consequently the thrust of the corner bars is transmitted to the bucket through the corner brackets and the structure of the corner brackets and the manner of cooperation thereof with the bucket are of considerable consequence.

When clamshell buckets were used only for moving loose material it was the customary practice to position the corner brackets inside the bucket corners and rivet them to the sides of the bucket. This practice was continued when clamshell buckets came to be used for heavier work, but the bracket extensions to which the corner rods are connected were made longer and extended entirely outside the back of the bucket to afford greater leverage in operation. This construction was not fully satisfactory as it required making the corner brackets of relatively massive construction, considerably increasing their cost, and also required much firmer connections between the corner brackets and the bucket, which further added to the cost of the structure as a whole. Moreover, it was found that despite the strengthening of the corner brackets and their connections with the bucket a tendency existed to tear the corner brackets off of the sides of the bucket when the open bucket was dropped upon a relatively hard surface such as might be encountered in excavating in rock strata or in removing old pavements. The rivets connecting the corner brackets to the bucket sides were called upon to sustain the entire shock occasioned upon dropping of the bucket and repeated such shocks resulted in loosening of the rivets and consequent misalignment and bending of the structure.

Thereafter corner brackets extending inside the bucket but having a lip passing over the edge of the bucket and down the outside of the back of the bucket came into use in an effort to obviate the disadvantages of the earlier corner bracket structure above referred to. However, these modified corner brackets were likewise found to be far from satisfactory. It was found practically impossible to make a proper fit between the inside and outside portions of the bracket and the back of the bucket without machining, which, of course, could not be resorted to on account of cost. The fit was almost always either too loose or too tight. If it was too loose the rivets would soon loosen with a result similar to that above described in the case of the earlier structure. If the fit was too tight difficulties were encountered in assembly with a consequent increase in manufacturing cost, and it was difficult to properly align the bearings in the bracket extensions and in the corner bars and to insert the pivot pins therein, which bearings and pivot pins had of course to be machined before attachment of the corner brackets to the bucket.

I have devised a corner bracket structure for clamshell buckets obviating all of the disadvantages above mentioned which have been inherent in corner brackets heretofore employed, and a clamshell bucket structure embodying my improved corner brackets is found to have important advantages in operation. I provide a corner bracket for clamshell buckets which comprises three generally plate-like portions which are preferably integrally connected together so as to form a structure similar to a corner of a box adapted to be placed over an upper corner of the bucket so that two of such portions lie against the outside of the bucket and may be connected respectively with the back and side of the bucket and the third of such portions overlies the upper edge of the bucket, the bracket having an extension for connection with a corner bar for operating the bucket integrally connected with said structure. I prefer to cast the bracket as a single integral casting, although the parts thereof may be joined together, as, for example, by welding. In any event, my bracket preferably has a continuous generally L-shaped body having a first portion adapted to lie against the outside of and be connected with the back of the bucket and a second portion adapted to lie against the outside of and be connected with the side of the bucket. The top portion of the bracket which is connected with both of said first and second portions acts as a bracing member and makes the bracket as a whole very strong and rigid. The first and second portions above mentioned lie against the outside of the bucket at the corner and each is directly connected with the bucket, preferably by rivets. The bracket extension for connection with a corner bar for operating the bucket is preferably integrally connected with both of the back and top portions of the bracket. The extension preferably extends outwardly from the outside of the back of the bucket and has means for connection with the corner bar positioned so that such connection is effected entirely outside the back of the bucket. By reason of the strength and rigidity of the bracket the extension for connection with the corner bar

may be made relatively long without undesirable effect, affording maximum leverage for the corner bars, which in turn insures maximum gripping power when the bucket is closed. When the bucket is open the thrust of the corner bars is such as to press the brackets directly against the corners of the bucket so that there is no tendency to tear the brackets away or to loosen their connection with the bucket corners. In my improved structure there is no overhanging lip on the corner bracket and no problem of fitting the corner bracket over the edge of the bucket. A clamshell bucket equipped with my improved corner brackets is adapted for hard digging without any of the disadvantages encountered with the prior structures.

Other details, objects and advantages of the invention will become apparent as the following description of a present preferred embodiment thereof proceeds.

In the accompanying drawings I have shown a present preferred embodiment of the invention, in which:

Figure 1 is a side view of a clamshell bucket embodying my invention, the bucket being shown in closed position in full lines and in open position in dot and dash lines;

Figure 2 is a fragmentary view to enlarged scale of a corner of the bucket showing one form of my improved corner bracket in top plan view;

Figure 3 is a further fragmentary view of the same corner of the bucket showing the bracket in side view; and

Figure 4 is a further fragmentary view of the same corner of the bucket showing the bracket as viewed from the back of the bucket.

Referring now more particularly to the drawings, there is shown a clamshell bucket structure designated generally by reference numeral 2. The general structure of the bucket and its operating mechanism may be of any well known form such, for example, as disclosed in Patent No. 1,686,176. As the bucket operating means forms no part of the present invention only the bucket per se and the lower ends of the corner bars are shown in the drawings, it being understood that suitable supporting and operating mechanism will be employed.

The bucket comprises opposed bucket members or scoops 3 which may be of known construction each having opposed sides 4, the upper portions of which are constituted by portions of a bent plate 5. The plate 5 of each scoop is of generally U shape and forms the upper portion of both the sides and the back of the scoop in the structure shown in the drawings. The back of each scoop below the portion of the bent plate 5 disposed at the back of the scoop is designated by reference numeral 6 and merges into the bottom 7. Each scoop is provided with a digging edge having teeth 8, the teeth of the respective scoops being staggered so that they interfit when the bucket is closed as shown in Figure 1. Each scoop has an extension 8' and a pivot pin 9' passes through both such extensions as well known in the art. The bucket operating mechanism, most of which is not shown, may be conventional.

Connected with each of the two upper corners of each of the two scoops 3 is a corner bracket designated generally by reference numeral 9. The corner bracket structure is shown in detail in Figures 2, 3 and 4. Each of such brackets comprises a first or back portion 10 which lies against the outside of and is connected with the back of the bucket, a second or side portion 11 which lies against the outside of and is connected with the side of the bucket, and a top portion 12 which is integrally connected with both of the portions 10 and 11 and overlies the upper edge 13 of the bucket at the corner thereof. The respective bracket portions 10 and 11 are connected with the bucket by rivets 14.

The bracket has an extension 15 which at its outer extremity is bifurcated to provide opposed bearing portions 16, the extension being preferably integrally connected with both of the portions 10 and 12 of the bracket. As above mentioned, the bracket is preferably cast as a single piece, although it may be otherwise formed so that the respective parts thereof will be solidly maintained in their relation to each other. In the form shown in the drawings the extension 15 forms a part of a unitary casting and is joined to the portion 10 of the bracket throughout substantially the entire height of such portion and is also joined to the top 12 of the bracket as shown at 17. The opposed bearing portions 16 of the bracket 15 are drilled and machined for the reception of a pin 18 connecting the corner bracket with one of the corner bars 19 whose lower extremity is likewise drilled and machined and lies between the bearing portions 16 and also receives the pin 18. The extension 15 extends outwardly from the outside of the back of the bucket so that the pin connection between the bracket and the corner bar lies entirely outside the back of the bucket, as shown in Figures 1 and 3.

No part of my improved corner bracket as shown extends within the bucket. By reason of the rigid connection of the side and back portions of the bracket to the side and back of the bucket and the connection of such side and back portions of the bracket by the top portion 12 thereof a very strong and rigid structure is provided. No interfitting of the bracket and any portion of the bucket is required, the bracket simply being laid over the corner of the bucket and the side and back portions of the bracket being riveted to the side and back portions of the bucket, respectively. When the open bucket is dropped on a hard surface the brackets are thrust cornerwise directly against the upwardly presented corners of the bucket scoops so that there is no tendency to tear away or disengage the brackets but only to more tightly engage them against the corners of the bucket. The brackets may be accurately adjusted in position in relation to the bucket so that the pin connections with the corner bars may be properly aligned.

As above mentioned, the strength and rigidity of the bracket structure and its relation to the bucket makes it feasible to substantially increase the length of the extension 15 so that greater leverage and gripping power is afforded in closing of the bucket. My clamshell bucket structure as a whole is far better adapted for heavy work than any clamshell bucket structure heretofore available with which I am familiar.

While I have shown and described a present preferred embodiment of the invention, it is to be distinctly understood that the same is not limited thereto but may be otherwise variously embodied within the scope of the following claims.

I claim:

1. A corner bracket for a clamshell bucket, comprising a first portion adapted to lie against the outside of and be connected with the back of the bucket, a second portion adapted to lie against the outside of and be connected with the

side of the bucket, a top portion integrally connected with both of said first and second portions adapted to overlie the upper edge of the bucket, and an extension for connection with a corner bar for operating the bucket integrally connected with both of said first and top portions.

2. A corner bracket for a clamshell bucket, comprising a continuous generally L-shaped body having a first portion adapted to lie against the outside of and be connected with the back of the bucket and a second portion adapted to lie against the outside of and be connected with the side of the bucket, a top portion integrally connected with both of said first and second portions adapted to overlie the upper edge of the bucket, and an extension for connection with a corner bar for operating the bucket integrally connected with both of said first and top portions.

3. A corner bracket for a clamshell bucket, comprising a first portion adapted to lie against the outside of and be connected with the back of the bucket, a second portion adapted to lie against the outside of and be connected with the side of the bucket, a top portion integrally connected with both of said first and second portions adapted to overlie the upper edge of the bucket, and an extension for connection with a corner bar for operating the bucket integrally connected with both of said first and top portions and extending outwardly from the outside of the back of the bucket and having means for connection with the corner bar positioned so that such connection is effected entirely outside the back of the bucket.

4. A corner bracket for a clamshell bucket, comprising a first portion adapted to lie against the outside of and be connected with the back of the bucket, a second portion adapted to lie against the outside of and be connected with the side of the bucket, a top portion connecting said first and second portions adapted to overlie the upper edge of the bucket, and an extension for connection with a corner bar for operating the bucket integrally connected with said first portion and extending outwardly from the outside of the back of the bucket and having means for connection with the corner bar positioned so that such connection is effected entirely outside of and substantially spaced from the back of the bucket.

5. A corner bracket for a clamshell bucket, comprising three generally plate-like portions integrally connected together so as to form a structure similar to a corner of a box adapted to be placed over an upper corner of the bucket so that two of said portions lie against the outside of the bucket and may be connected respectively with the back and side of the bucket and the third of said portions overlies the upper edge of the bucket, and an extension for connection with a corner bar for operating the bucket integrally connected with said structure.

6. A corner bracket for a clamshell bucket, comprising three generally plate-like portions integrally connected together so as to form a structure similar to a corner of a box adapted to be placed over an upper corner of the bucket so that two of said portions lie against the outside of the bucket and may be connected respectively with the back and side of the bucket and the third of said portions overlies the upper edge of the bucket, and an extension for connection with a corner bar for operating the bucket integrally connected with two of said three generally plate-like portions.

7. A corner bracket for a clamshell bucket, comprising three generally plate-like portions integrally connected together so as to form a structure similar to a corner of a box adapted to be placed over an upper corner of the bucket so that two of said portions lie against the outside of the bucket and may be connected respectively with the back and side of the bucket and the third of said portions overlies the upper edge of the bucket, and an extension for connection with a corner bar for operating the bucket integrally connected with said structure and extending outwardly from the outside of the back of the bucket and having means for connection with the corner bar positioned so that such connection is effected entirely outside the back of the bucket.

8. A clamshell bucket structure comprising opposed openable and closable bucket members, corner brackets on the upper corners of said bucket members, each of said brackets comprising a first portion lying against the outside of and connected with the back of the bucket member to which it is attached, a second portion lying against the outside of and connected with the side of such bucket member, a top portion connecting said first and second portions overlying the upper edge of such bucket member and an extension for connection with a corner bar for operating the bucket integrally connected with the bucket, and operating means for the bucket including corner bars connected with the respective bracket extensions.

9. A clamshell bucket structure comprising opposed openable and closable bucket members, corner brackets on the upper corners of said bucket members, each of said brackets comprising three generally plate-like portions integrally connected together so as to form a structure similar to a corner of a box and positioned with two of said plate-like portions lying against the outside of the bucket member to which it is attached and connected respectively with the back and side of such bucket member and with the third of such portions overlying the upper edge of such bucket member and an extension for connection with a corner bar for operating the bucket integrally connected with said bracket structure, and operating means for the bucket including corner bars connected with the respective bracket extensions.

10. A clamshell bucket structure comprising opposed openable and closable bucket members, corner brackets on the upper corners of said bucket members, each of said brackets comprising a first portion lying against the outside of and connected with the back of the bucket member to which it is attached, a second portion lying against the outside of and connected with the side of such bucket member, a top portion connecting said first and second portions overlying the upper edge of such bucket member and an extension for connection with a corner bar for operating the bucket integrally connected with the bracket, and operating means for the bucket including corner bars connected with the respective bracket extensions, the connections between the respective corner bars and bracket extensions lying entirely outside the back of the bucket.

GEORGE J. EHRHARDT.

CERTIFICATE OF CORRECTION.

Patent No. 2,161,147. June 6, 1939.

GEORGE J. EHRHARDT.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 3, second column, line 34, claim 8, for "bucket" first occurrence, read bracket; 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 4th day of July, A. D. 1939.

(Seal)

Henry Van Arsdale
Acting Commissioner of Patents.