Aug. 30, 1949. D. M. SCHWARTZ 2,480,384

SHOVEL BUCKET

Filed Sept. 10, 1947

Fig. 1.

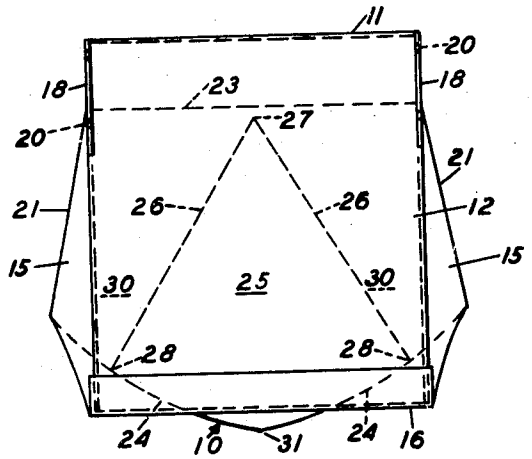


Fig. 2.

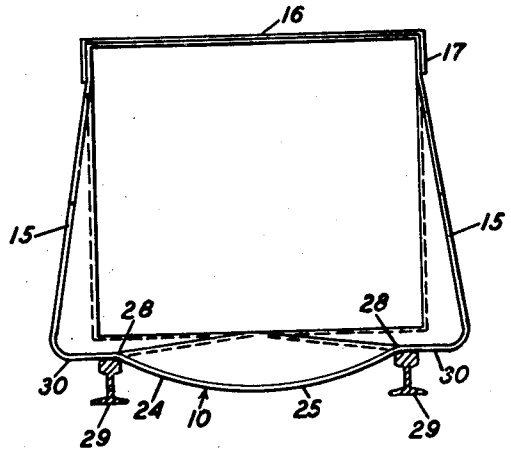
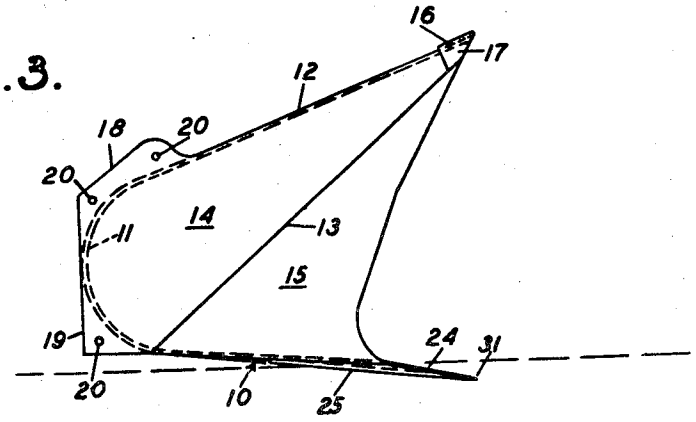


Fig. 3.



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SHOVEL BUCKET

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8 Claims. (Cl. 214—145)

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This invention relates to shovel buckets for scooping material from the side of and between track rails and more particularly to a bucket for use with a shovel or loader of the type shown in U. S. Patent 1,906,001 issued April 25, 1933, to John S. Finlay et al.

An object of the invention is to provide a shovel bucket for the intended purpose having a smoothly curved cutting and digging edge that eliminates re-entrant angles along the cutting lip to minimize stress concentrations and cracking.

Another object is to provide a shovel bucket that has an arcuately depressed center portion capable of digging between track rails.

Another object is to provide a bucket construction that permits of simple and economical manufacture and that has a long service life. The bucket of the invention can be fabricated from steel plate by simple bending and welding operations.

Typically, the invention is embodied in a shovel bucket for scooping material from adjacent track rails, including a bottom panel, a rear panel and side panels cooperating to define a bucket, the bottom panel having marginal portions adapted to overlie track rails and a depressed portion intermediate the marginal portions, the front edge of the depressed portion being continuous with the front edges of the adjacent marginal portions. In an exemplary form, the midportion of the bottom panel is arcuately depressed along boundary lines or bend lines extending inwardly on the bottom panel from spaced points at the front edge thereof. In the bottom panel, the front edge of each marginal portion and the front edge of the lateral half of the depressed portion adjacent thereto preferably lie along a continuous circular arc.

The aims, objects, and advantages of the invention, to which reference has hereinbefore been made, will be amplified and augmented in the following detailed description of an exemplary embodiment as shown in the accompanying drawings, wherein:

Fig. 1 is a plan view of a shovel bucket in accordance with the invention;

Fig. 2 is a front view of the bucket shown in Fig. 1; and

Fig. 3 is a side view of the bucket.

Referring to the drawings, in which like reference numerals refer to like parts in the several views, the shovel bucket shown has a bottom panel 10 merging into a cylindrical rear panel 11 which may be extended upwardly and forwardly to form a top panel 12. Each of the side

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panels of the bucket may be formed of two portions welded together along the line 13. The upper rear portions 14 of the side panels may be fabricated from sections of flat plate stock and the forward lower portions 15 may conveniently be formed by bending extensions of the bottom panel into the flared configuration shown and butt-welding them to the portions 14 along the lines 13.

In the construction shown, a cap strip 16 having depending side members 17 is welded along the front edge of the top plate 12 and to the side plates 14 to strengthen the bucket.

The side sections 14 are extended above, to the rear and below the cylindrical rear panel 11 to provide brackets 18 and 19 having holes 20 by which the bucket is bolted or riveted to the shovel arm (not shown).

As best seen in Fig. 1, the bottom panel 10 is bounded by the line 23 at the rear, the lines 21—21 at the sides, and the curved digging edges 24—24 at the front. The midportion 25 of the bottom panel is arcuately depressed by bending along the lines 26—26 that extend angularly from a point 27 on the median line of the bottom panel adjacent the back thereof to spaced points 28—28 on the front edge thereof. The points 28—28 are located so that they fall at about the inner edges of track rails 29 when the bucket is resting upon the rails as shown in Fig. 2. The metal is bent along the boundary lines 26—26 on a short radius of curvature to provide the marginal portions 30—30 adapted to overlie the rails and to limit downward movement of the bucket by contact with the rails. The marginal portions are separated from the depressed central portion by the aforesaid boundary lines.

The front edges 24—24 of the bottom panel are curved as seen in Fig. 1 and preferably are circularly arcuate about centers disposed well to the rear of the front edges. The edges 24—24 meet at the median line to form the digging point 31. Preferably, the front edges 24—24 are beveled as seen in Fig. 3 to provide a sharp cutting edge.

It will be noted that the bend lines 26—26 intersect the front edges 24—24 of the bottom panel at points on smoothly curved portions of the front edges and that no sharp angles exist in the front edges at these points of intersection to give rise to stress concentration and cracking of the metal.

In use, the shovel bucket may be mounted on a shovel or mucker, for example, as shown in the Finlay et al. Patent 1,906,001, and operated

as described in the patent to remove and load material such as loose earth or muck piled between tracks on which the mucker runs. When the bucket is rammed into a pile of material, severe shearing stresses are imposed along the front edge, especially at the points 28, by downward force exerted by the material on the arcuately depressed center portion 25 opposed by the counter upward force exerted by the rails 29 on which the marginal portions 30 of the bucket slide. These shearing forces tend to crack and tear the bottom panel of the bucket. The absence of re-entrant angles along the lip of the bucket of this invention minimizes stress concentrations and damage.

When the bucket is dropped to the rails there is a high impact at the points 28. Repeated impacts soon tend to fatigue the metal at these points. The smooth contour minimizes concentrations of stress which would cause rapid fatigue, and raises the fatigue strength of the bucket.

The bucket is also used to scoop alongside track rails, on the outside of the track. When the machine is swung to one side, its angular limit of swing corresponds about to the angle of the bend line 26. Thus a marginal portion of the bucket rests on the rail, which is about parallel to line 26, and the lip extends below the top of the rail.

Bucket bottoms may be made separately, for welding into existing or separately fabricated buckets.

From the foregoing description it will be seen the present invention provides a highly serviceable shovel bucket that is simple yet rugged in construction and that minimizes breakage due to stresses imposed along the front or digging edge of the bucket.

I claim:

1. A shovel bucket for scooping up material lying adjacent to a pair of track rails comprising a bottom panel, a rear panel and side panels cooperating to define a bucket, said bottom panel having horizontal marginal portions adapted to overlie track rails and a depressed portion intermediate said marginal portions, the front edge of said depressed portion being depressed with respect to and continuous with the front edges of the adjacent marginal portions.

2. A shovel bucket for scooping up material lying adjacent to a pair of track rails comprising a bottom panel, a rear panel and side panels cooperating to define a bucket, said bottom panel having marginal portions adapted to overlie track rails and a midportion depressed with respect to said marginal portions along boundary lines extending inwardly on said bottom panel from spaced points on the front edge thereof, the front edge of said depressed portion being continuous with the front edges of the adjacent marginal portions.

3. A shovel bucket for scooping up material lying adjacent to a pair of track rails comprising a bottom panel, a rear panel and side panels cooperating to define a bucket, said bottom panel having marginal portions adapted to overlie track rails and a midportion depressed with respect to said marginal portions along boundary lines extending inwardly on said bottom panel from spaced points on the front edge thereof, the front edge of each marginal portion and the front edge of the lateral half of said depressed portion adjacent thereto lying along a continuous curve.

4. A shovel bucket for scooping up material lying adjacent to a pair of track rails comprising a bottom panel, a rear panel and side panels cooperating to define a bucket, said bottom panel having marginal portions adapted to overlie track rails and a midportion depressed with respect to said marginal portions along bend lines extending inwardly on said bottom panel from spaced points on the front edge thereof, the front edge of said depressed portion being continuous with the front edges of the adjacent marginal portions.

5. A shovel bucket for scooping up material from adjacent to a pair of track rails comprising a bottom panel, a rear panel, side panels and a top panel cooperating to define a bucket, said bottom panel having marginal portions adapted to overlie track rails and a midportion arcuately depressed with respect to said marginal portions along substantially straight bend lines extending inwardly on said bottom panel from spaced points on the front edge thereof to a medial point thereon adjacent said rear panel, the front edge of said depressed portion being continuous with the front edges of the adjacent marginal portions.

6. In a shovel bucket for scooping material from adjacent a raised obstruction; a bottom panel section having a marginal portion adapted to overlie the obstruction and a depressed portion depressed with respect to said marginal portion along a boundary line extending inwardly from the front edge of said bottom panel section, the front edges of said portions being continuous.

7. In a shovel bucket for digging adjacent a raised obstruction; a bottom panel section having a forwardly extending portion depressed below an adjacent portion along a boundary line extending inwardly from the front edge of said bottom panel section, the front edges of said portions being continuous.

8. In a shovel bucket for scooping material from adjacent a raised obstruction; a bottom panel section having a marginal portion adapted to overlie the obstruction and a depressed portion depressed with respect to said marginal portion along a boundary line extending inwardly from the front edge of said bottom panel section, the front edges of said portions lying along a substantially continuous curve.

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