Feb. 27, 1962 G. H. ECKELS ETAL 3,022,854

MOBILE AERIAL TOWER

Filed July 28, 1960

3 Sheets-Sheet 1

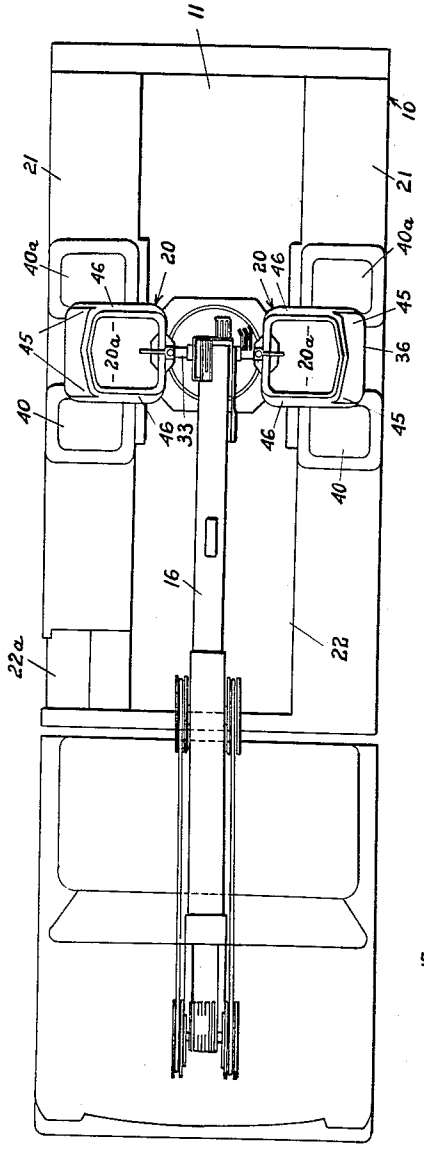


Fig. 1

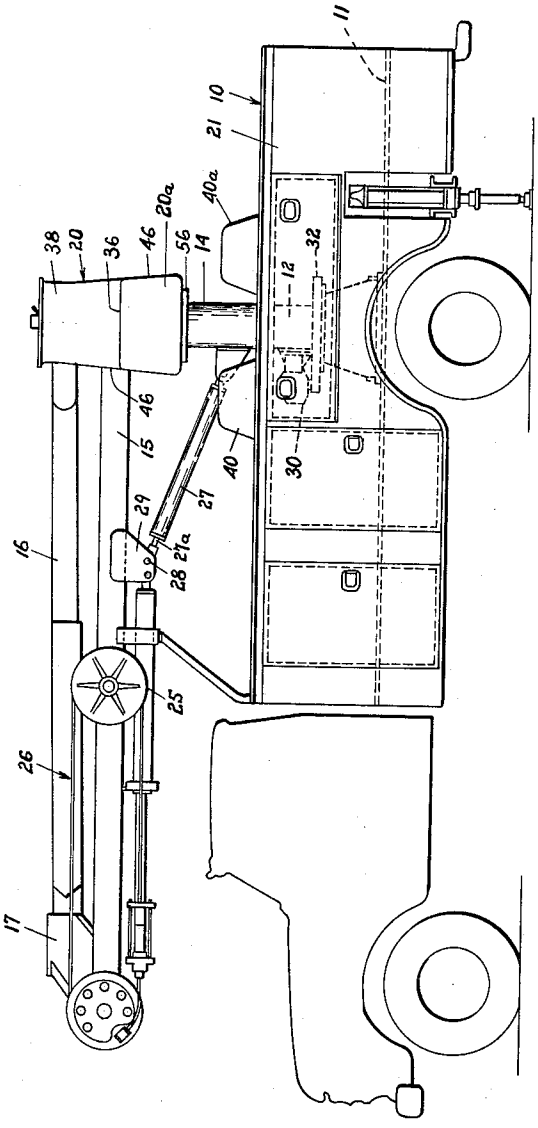


Fig. 2

INVENTORS
GEORGE H. ECKELS
HERMAN J. TROCHE

BY

Teare & Fetzer
ATTORNEYS

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3 Sheets-Sheet 2

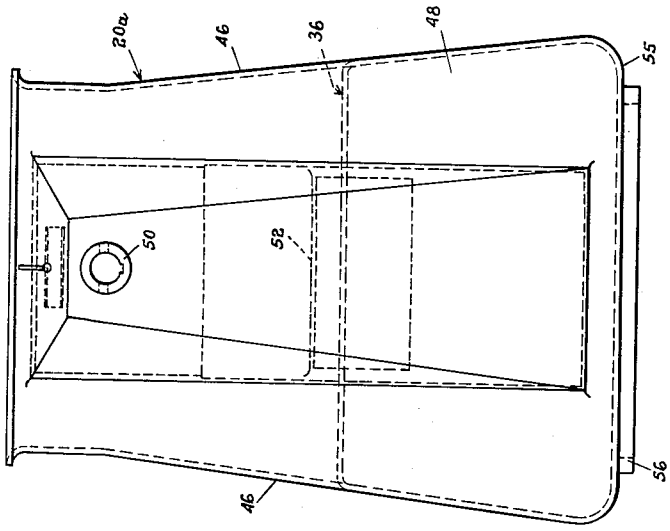


Fig. 4

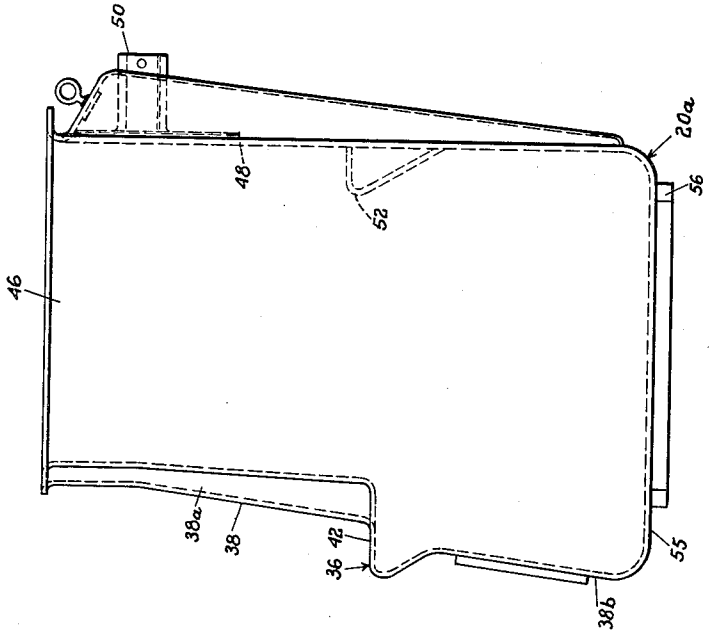


Fig. 3

INVENTORS
GEORGE H. ECKELS
HERMAN J. TROCHE

BY

Teare & Fetzer
ATTORNEYS

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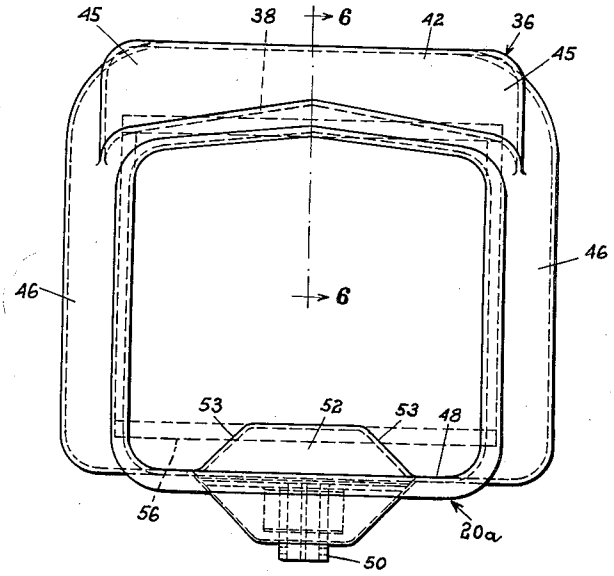


Fig. 5

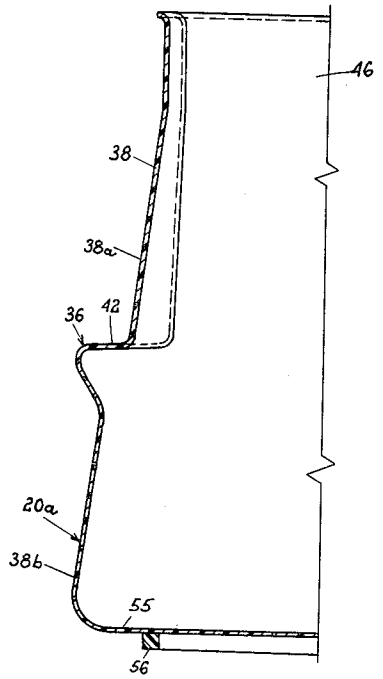


Fig. 6

INVENTORS
GEORGE H. ECKELS
HERMAN J. TROCHE

BY

Teare & Fetzer
ATTORNEYS

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MOBILE AERIAL TOWER

George H. Eckels, Lakewood, and Herman J. Troche, Fairview Park, Ohio, assignors to Holan Corporation, Cleveland, Ohio, a corporation of Ohio

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9 Claims. (Cl. 182—2)

This invention relates in general to a collapsible mobile aerial tower comprising work platform structure mounted on the tower for supporting a workman, and more particularly relates to a structural and organizational arrangement of such work platform structure for facilitating the entry of a workman thereinto and the exit of the workman therefrom.

Towers of the latter type are conventionally mounted on a truck-like vehicle, and may be used to provide access to traffic lights, street lamps, overhead power lines and similar objects, for installation, maintenance and repair thereof. The work platform structure is conventionally mounted on the outer end of the tower boom and may include means for providing for various movements of the work platform structure relative to the tower boom, and, for instance, for the purpose of maintaining the work platform structure level with respect to the horizontal in any position of the tower throughout its operating range.

One well known type of work platform structure which has found high favor in the art comprises one or more basket-like or bucket-like members disposed in cantilever fashion on the tower boom. Such basket or bucket-like members conventionally comprise a bottom wall, and enclosing side walls of substantial height, defining an open top enclosure for supporting a workman in safety on the outer end of the boom. Entry into and exit from such bucket-like enclosure is generally accomplished when the tower is in collapsed, carried condition on the vehicle. However access by the workman into and from such a bucket construction is somewhat restricted, and is relatively awkward due to the compartively high and encompassing side walls.

The present invention provides an aerial tower having an improved platform structure arrangement which facilitates movement of a workman into and from the platform structure, thereby providing a more desirable aerial tower from a usability standpoint. Moreover, the present invention provides a work platform arrangement for an aerial tower which facilitates the manufacture of the platform buckets or baskets, and cuts down on the numbers of baskets needed to be stocked when the latter are utilized in a paired arrangement on the tower.

Accordingly, an object of the invention is to provide a mobile aerial tower having an improved workman supporting platform arrangement.

A further object of the invention is to provide an aerial tower of the latter type embodying means for greatly facilitating the entry of a workman into and his exit from, the platform structure.

A more specific object of the invention is to provide an aerial tower of the latter type wherein the platform basket or bucket is formed of moldable material, such as fiber glass impregnated with a suitable plastic or resin, to give it the desired rigidity and strength, and which embodies an integrally molded step on the outwardly facing exterior side surface thereof, which step extends completely across such side surface, facilitating entry of a workman into and from the basket from either the front or the rear sides thereof, and which platform or bucket construction eliminates the necessity, conventional with prior art arrangements, of manufacturing a different arrangement of right and left hand buckets when the latter are used in a paired arrangement on the tower boom.

A still further object of the invention is to provide a bucket construction which facilitates the manufacture of the buckets, and which reduces the number of bucket types which have to be maintained in stock when a paired arrangement of buckets is utilized on a tower boom.

Other objects and advantages of the invention will be apparent from the following description taken in conjunction with the accompanying drawings wherein

FIG. 1 is a more or less diagrammatic top plan view of a utility truck embodying an aerial tower arrangement constructed in accordance with the instant invention;

FIG. 2 is a side elevational view of the FIG. 1 showing;

FIG. 3 is an enlarged, front or rear, elevational view of one of the buckets or basket-like work platform structures of the aerial tower;

FIG. 4 is an inner side, elevational view of the bucket structure illustrated in FIG. 3, taken from the right hand side of the latter;

FIG. 5 is a top plan view of the FIGS. 3 and 4 bucket structure;

FIG. 6 is a fragmentary, vertical sectional view taken substantially along the plane of line 6—6 of FIG. 5, looking in the direction of the arrows.

Referring now again to the drawings and in particular to FIGS. 1 and 2 thereof, there is shown a wheeled utility vehicle 10 having a truck body forming a base 11 which carries a vertical pedestal 12 the upper portion 14 of which is rotatable in a horizontal plane, preferably through 360°, and supports a collapsible or articulated tower assembly adjacent its upper extremity. Such tower assembly as presently illustrated includes a pair of preferably hollow, tower boom members or sections 15 and 16 pivotally interconnected at one of their adjacent ends through a saddle member 17. Such pivotal construction enables the upper section 16 to be pivoted in a vertical plane relative to the lower section 15. Tower section 16 carries work platform structure, generally indicated by reference number 20, adjacent its free extremity. The truck body preferably embodies side wall sections 21 which extend above the level of support 11, and which partially define an enclosure 22, access to which may be conveniently had by way of steps 22a.

The upper tower section 16 may be pivoted or tilted relative to the lower tower section 15 by means of a fluid actuated, double acting, piston motor 25 and a coacting cable and sheave control system 26, the latter arrangement being known in the art and therefore not being discussed here in detail.

The lower tower section 15 may be tilted with respect to the mast 12 by means of a fluid actuated, double acting piston motor 27 anchored at one end to the rotatable portion 14 of the mast. The other end of the motor 27 may be pivotally connected as at 28 to a bracket 29 mounted intermediate the ends of the lower section 15 of the tower.

The upper portion 14 of the mast 12 may be rotated in a horizontal plane, as by means of a two-way fluid actuated motor 30, which may have a driving connection with such upper portion in any suitable manner, such as by means of the gearing 32, and in a manner well known in the art.

Thus controlled operation of the collapsible tower assembly to position the work platform structure 20 to the desired work location is accomplished by selectively supplying operating fluid to each of the fluid motors 25, 27, 30 through conventional fluid piping systems, including fluid supply and return lines, such systems not being described in detail since they form no particularly novel part of the instant invention.

The work platform structure 20 comprises the com-

paratively deep, basket or bucket members 20*a* hung in generally cantilever fashion on a shaft 33 mounted on the outer end of boom section 16. In the embodiment shown, a paired arrangement is illustrated, or in other words both a right and a left hand bucket are utilized. Such work platform structure or buckets may be automatically maintained in level position with respect to the vehicle body and may be selectively moved relative to the tower boom in generally horizontal planes, to adjust the position of the respective bucket with respect to the tower, in a manner known in the art.

As can be best seen in FIG. 1, each of the buckets 20*a* when so mounted in cantilever fashion on the outer end of the boom section 16, projects or is disposed generally laterally to one side of the boom. Each bucket member 20*a* is preferably formed of moldable, relatively light material, such as fiber glass impregnated w.th a suitable plastic or resin (many of which are known) to provide an expeditiously manufactured, high strength article.

In accordance with the instant invention, a step or ledge 36 is integrally molded onto the exterior of outer side wall 38 of the bucket structure, intermedate the upper and lower ends of the bucket. Step 36 extends completely across such side wall 38 and therefore provides for ready accessibility into and from the respective bucket from either the front or rear sides thereof. In this connection, the truck body may be provided with raised steps or platform means 40, 40*a* on the side sections 21 of the truck body, to facilitate stepping by a workman from the truck body to ledge 36 and thence into the bucket. The top surface 42 of ledge 36 is preferably substantially horizontal as shown and is preferably roughened, such as for instance a sanded surface, to provide a slip-resistant finish therefor.

As can be best seen in FIGS. 3 to 6, the front and rear side walls 46, and the aforementioned outer side wall 38 of the bucket member 20*a* are flared outwardly from the tops toward the bottoms thereof, to provide for increased leg and foot room for a workman disposed in the bucket. In this connection it will be seen from FIGS. 5 and 6 that the upper section 38*a* of outer side wall 38 which is disposed above step 36 is likewise flared in a direction lengthwise thereof, to also provide for such increased leg room, and that such upper section of wall 38 is also tapered commencing at the vertical center thereof and extending toward the ends thereof in a direction transverse of wall 38, to provide wider portions 45 for the ledge 36 adjacent the front and rear walls 46 of the respective bucket, all of which port ons coact to facilitate the entry of a workman into and his exit from the bucket, when the tower is disposed in its rest or carried position illustrated in FIGS. 1 and 2. Upper portion 38*a* of side wall 38 is also offset inwardly w.th respect to lower portion 38*b* of such side wall as can be best seen on FIG. 3, to thereby maintain a predetermined exterior dimensional bucket for passage of the latter between wires or like obstructions, while providing for a substantial increase in ledge size.

The inner side wall 48 of the bucket is provided with a hollow boss 50 projecting laterally outwardly therefrom for attachment of the bucket to the shaft 33 on the tower boom, and in a manner well known in the art. An interior step 52 may also be provided on the inner surface of wall 48 to facilitate movement of the workman into and from the bucket. It will be seen that a workman disposed in the bucket and desirous of leaving the latter can readily put one foot on the interior ledge 52, throw his other leg over the top edge of the bucket and step onto ledge 36 with such other leg, while removing the first mentioned leg from interior step 52. He then can step down to one or the other of the platforms 40, 40*a* on the truck body. Disposal of the top surface of interior step 52 above the top surface of exterior step 36, and as best shown in FIG. 3, facilitates the aforedescribed exit movement of a workman from a bucket as well as facilitates the entry of a workman into the bucket. Such interior ledge or step 52 has inwardly convergent front and rear end surfaces 53 (FIG. 5) which are disposed in substantial spaced relation to the respective front or rear side wall 46 of the bucket, thereby maintaining considerable leg space in the bucket in the vicinity of shelf 52. Shelf 52 may be filled with a filler material, such as a synthetic foam, to increase the strength characteristics thereof, and facilitate its formation on wall 48.

The bottom wall 55 of the bucket may be provided with an exterior bumper 56 preferably comprised of rubber or the like, which may be attached to the exterior of such bottom wall by any suitable means, such as an adhesive, to provide shock protection for the bucket bottom if the latter engages an object during positioning movement of the aerial tower.

It will be seen that with the symmetrical arrangement of bucket construction wherein the exterior step 36 is disposed on outer side wall 38 in symmetrical relation to the vertical center thereof, the bucket can be used for both right and left hand buckets, thereby eliminating the necessity inherent in prior art arrangements of stocking different constructions of buckets for the right and the left in a paired arrangement as for instance illustrated in FIG. 1.

From the foregoing description and accompanying drawings it will be seen that the instant invention provides an improved collapsible mobile aerial tower embodying an improved work platform or bucket arrangement for facilitating movement of a workman into and from a work platform bucket mounted on the tower. It will also be seen that the present invention provides a bucket construction of the latter type which is readily manufactured and which eliminates the necessity of stocking a plurality of bucket constructions for both left and right hand buckets, when the latter are utilized in a paired arrangement.

The terms and expressions which have been used are used as terms of description and not of limitation and there is no intention in the use of such terms and expressions of excluding any equivalents of the invention shown or described, or portions thereof, but it is recognized that various modifications are possible within the scope of the invention claimed.

We claim:

1. In a mobile aerial tower comprising a support, a boom movably mounted on said support, a work platform structure mounted on said boom, said work platform structure comprising an open top bucket-like member pivoted to said boom, said bucket-like member comprising an outer generally upright side wall, a laterally extending exterior foot supporting ledge disposed intermediate the top and bottom boundaries of said outer side wall and providing a substantially horizontal foot engaging surface, said ledge projecting completely across said outer side wall in a direction transversely thereof, the portion of said outer side wall above said ledge being tapered in directions transversely thereof commencing substantially at the vertical center thereof and extending toward the side extremities thereof, to provide wider horizontal ledge portions at the front and rear ends of said ledge, said ledge providing for entry into and exit from said bucket-like member by workmen and from both the front and rear of said bucket-like member.

2. In an aerial tower in accordance with claim 1 including raised platform means disposed on said support, said raised platform means being disposed below the elevation of said ledge and adjacent vertical planes passing through both the front and rear extremities of said ledge.

3. In an aerial tower in accordance with claim 1 wherein said bucket-like member is comprised of moldable material, such as fiber glass impregnated with a plastic-like material, and wherein said ledge is integrally formed with said outer side wall.

4. In an aerial tower in accordance with claim 1 wherein said bucket-like member comprises front and rear side walls and an inner side wall, and wherein a foot supporting ledge is provided on the interior surface of said inner side wall projecting interiorly of the bucket-like member, said last-mentioned ledge having a substantially horizontal top foot supporting surface.

5. In an aerial tower in accordance with claim 4 wherein said top surface of said last mentioned ledge is disposed above the top surface of the first mentioned ledge, and wherein the front and rear ends of said last mentioned ledge are disposed in spaced relation to the corresponding front and rear side walls of said bucket-like member.

6. In a mobile aerial tower comprising a support, a boom movably mounted on said support, a work platform structure mounted on said boom, said work platform structure comprising an open top bucket-like member pivoted to said boom, said bucket-like member comprising a generally upright outer side wall, said outer side wall having a laterally extending foot supporting ledge disposed intermediate the top and bottom boundaries of said outer side wall and providing a substantially horizontal foot engaging surface, said ledge projecting completely across said outer side wall in a direction transversely thereof and providing for entry into and exit from said bucket-like member by workmen and from both the front and rear of said bucket-like member, the portion of said outer side wall disposed above said ledge being offset inwardly of the bucket and with respect to the portion of said outer side wall disposed below said ledge.

7. In combination, a vehicle providing a base, an aerial tower mounted on said base, said tower comprising a pair of tower sections pivotally interconnected in end-to-end relation for relatively articulated movement in a vertical plane with respect to each other, the free end of one of said sections being mounted on the base for rotation in a generally horizontal plane, the other of said sections adjacent its free end having a work platform structure mounted thereon for supporting a workman, said tower being collapsible into a carried, generally longitudinally extending position, said work platform structure comprising an enclosed, open topped bucket-like member, said member comprising front, rear, outer and inner side walls and a bottom wall, means on said inner side wall pivotally attaching said member in cantilever fashion on said other section so that said member is disposed laterally of said other section in the collapsed condition of said tower, said outer side wall having a ledge disposed intermediate the top and bottom boundaries of said outer side wall and disposed substantially within the confines of imaginary vertically upward extensions of the peripheral extremities of said bottom wall, said ledge providing a substantially horizontal foot supporting surface, said ledge extending completely across said outer side wall in a direction transversely thereof and providing for ready entry into and exit from said bucket-like member from both the front and rear thereof by a workman,

said outer side wall being flared outwardly in a downward direction, the flared portion of said outer side wall above said ledge being tapered in directions transversely thereof commencing substantially at the vertical center thereof and extending toward the side extremities thereof, to provide wider horizontal ledge portions at the front and rear ends of said ledge, and raised platform means on said base disposed below the elevation of said surface of said ledge in the collapsed condition of said tower, said platform means being disposed adjacent vertical planes passing through the front and rear extremities of said ledge in a direction longitudinally of said base when said aerial tower is in said collapsed condition.

8. A work platform bucket for a mobile aerial tower comprising front, rear, outer and inner side walls and a bottom wall defining an enclosure for supporting a workman on the aerial tower, means on said inner side wall for securing said bucket in pivotal relation on the aerial tower, said outer side wall on the exterior thereof comprising a ledge intermediate the top and bottom boundaries of said outer side wall, said ledge providing a substantially horizontal foot supporting surface, said surface extending completely across said outer side wall from the front extremity to the rear extremity thereof, the section of said outer side wall disposed above said ledge being tapered from substantially the vertical center thereof toward the front and rear boundaries thereof to provide wider ledge portions at the front and rear ends of said ledge.

9. A work platform bucket for a mobile aerial tower comprising front, rear, outer and inner side walls and a bottom wall defining an enclosure for supporting a workman on the aerial tower, means on said inner side wall for securing said bucket in pivotal relation on the aerial tower, said outer side wall on the exterior thereof comprising a ledge intermediate the top and bottom boundaries of said outer side wall, said ledge providing a substantially horizontal foot supporting surface, said surface extending completely across said outer side wall from the front extremity to the rear extremity thereof, the section of said outer side wall disposed above said ledge being offset inwardly of the bucket and with respect to the section of said outer side wall disposed below said ledge.

References Cited in the file of this patent

UNITED STATES PATENTS

481,888	Bergeron et al.	Aug. 30, 1892
1,192,226	Reagen	July 25, 1916
1,378,713	Nami	May 17, 1921
1,557,075	McLeod	Oct. 13, 1925
1,924,751	Porter	Aug. 29, 1933
2,312,833	Graham	Mar. 2, 1943
2,419,163	Pope	Apr. 15, 1947
2,915,137	Troche	Dec. 1, 1959
2,940,539	Richey	June 14, 1960