Sept. 8, 1936. L. A. PRICE 2,053,970

DRAG LINE EXCAVATOR BUCKET

Filed Sept. 24, 1934 2 Sheets-Sheet 1

Fig. 1.

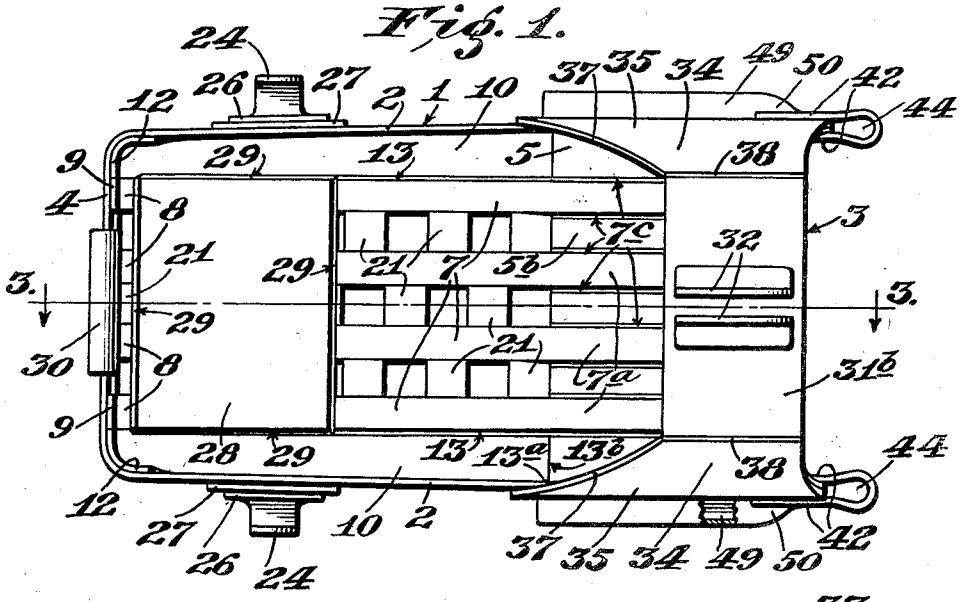
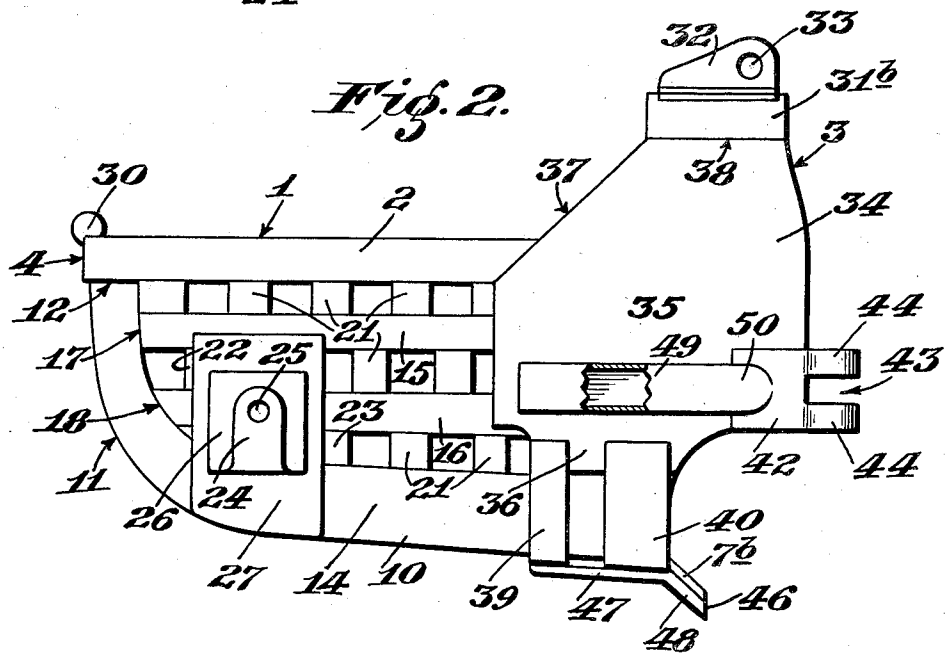


Fig. 2.



INVENTOR:
L. A. Price,
BY
His ATTORNEY.

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Fig. 3.

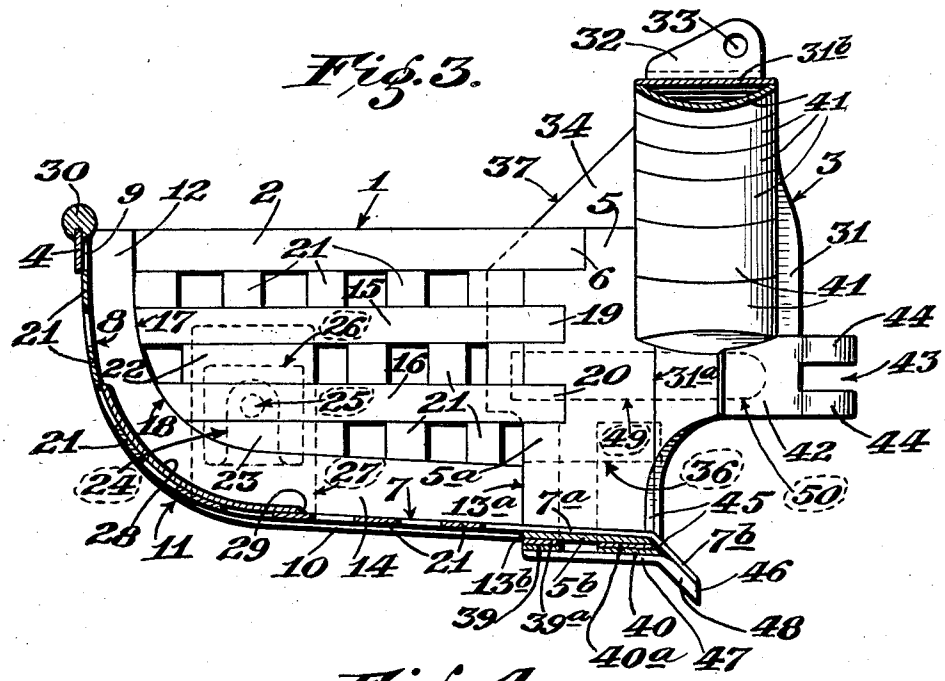
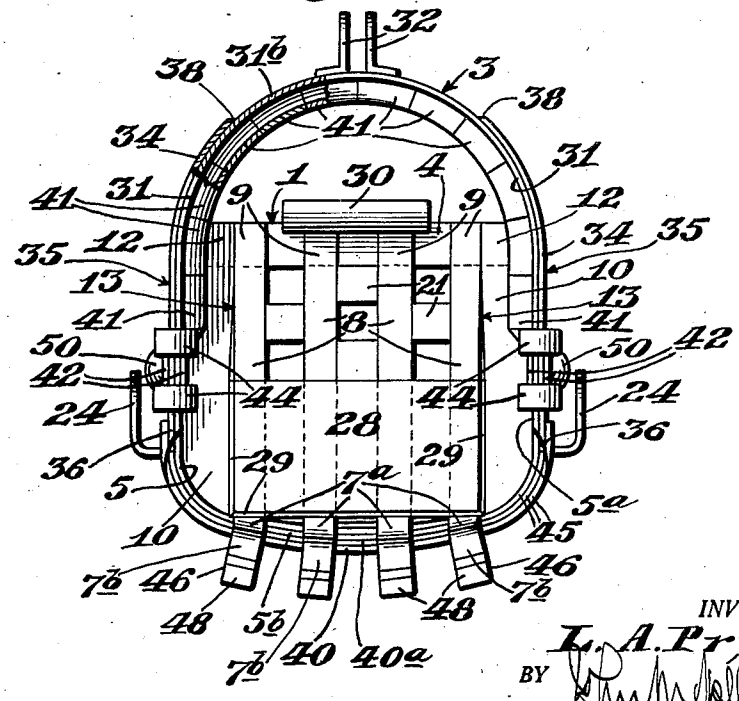


Fig. 4.



INVENTOR:
L. A. Price,
BY
His ATTORNEY.

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DRAG LINE EXCAVATOR BUCKET

Lewis A. Price, Dallas, Tex.

Application September 24, 1934, Serial No. 745,313

7 Claims. (Cl. 37—135)

This invention relates to drag buckets for digging, grading and excavating purposes and the like. It has for its principal object to produce an improved structure in a device of this kind, of relatively light weight but of requisite strength and durability for the rough use to which it is subjected in practice. Other objects and advantages to be attained will more fully appear in the following description.

The invention consists more particularly in the novel structure composed mainly of sheet and strip metal, assembled and fabricated without riveting, bolting or similar securing means, but generally throughout by a welding process to provide the characteristic rigidity and strength essential in such devices, and, further, in the parts and combinations and arrangements of parts as hereinafter described and set forth in the appended claims.

In the accompanying drawings, illustrating a practical adaptation of the invention,—

Figure 1 is a top plan view of the fabricated bucket;

Figure 2 is a side elevation thereof;

Figure 3 is a longitudinal vertical section on the line 3—3 of Figure 1; and

Figure 4 is a front elevation.

Referring now to the drawings, the numeral 1 designates, generally, the main body portion of the bucket, preferably of open-work construction as shown, the sides, rear wall and bottom of which comprise spaced longitudinal strips with spaced transverse connecting pieces which are welded edgewise together in accordance with an approved practice in such structures, although, in some cases, the walls and bottom of the bucket may be obviously constructed of sheet metal and have the openings produced therein by the use of an acetylene cutting torch or other means, the object being, of course, to provide a relatively light-weight yet rigid structure, as herein first generally stated, and at minimum cost in manufacture.

As shown, the uppermost wall strip 2 extends in one piece from opposite sides of the hood portion 3, to be later more specifically described, and across the rear wall of the bucket, as at 4. The forward end portions of the strip 2 are set into rectangularly recessed corner portions of an inner plate 5 of the hood portion 3 to be later more fully described, as at 6, and the parts there welded edgewise together, as are all the other structural parts hereinafter described in detail.

The bottom longitudinal strips 7 are extended upwardly, with curvature, at the rear portion of the bucket, as at 8, with their extreme end portions overlapping and welded to the inner face of the portion 4 of said uppermost wall strip 2, as at 9. These strips 7 are also extended forwardly from the bottom of the bucket to join with teeth elements as will be later more clearly specified.

At opposite sides of the bottom portion of the bucket are flanged, longitudinally elongated, corner plates 10, of curved cross-section, and extending upwardly, with curvature similar to that of said bottom strips 7, as at 11, and having their upper end portions welded to the inner face of said uppermost wall strip 2, as at 12. Said plate elements 10 are also welded throughout their length edgewise to the outermost bottom strips 7, as at 13, and at their forward ends edgewise to the hood plate 5, as at 13^a and 13^b.

The side walls of the bucket body comprise, in addition to said uppermost strip 2, the upstanding flange portions 14 of said corner plates 10 and the intermediate longitudinal side strips 15, 16, which are welded at their rear ends edgewise to the flange portions 14 of said plates 10, as at 17, 18, respectively. The forward end portions of these strips 15, 16, are set into rectangular recesses in said inner plates 5 of the hood portion 3 of the structure, as at 19, 20, respectively, and the parts there firmly welded edgewise together.

The several strip elements 2, 7, 15, 16, and corner plates 10, are cross-connected by the rectangular inserts 21, which are nearly all substantially square pieces throughout the structure. However, in a few instances said inserts are elongated or oblong, particularly in the side walls near the rear of the bucket, as at 22, and also tapered as at 23, where bracket members are provided on the outside of the bucket. Said bracket members, as shown, comprise upstanding ears or lugs 24, apertured, as at 25, for the attachment of lifting and dumping cables or chains in the use of the bucket, said ears or lugs being each preferably formed integrally or in a single piece with a plate 26, welded flatwise to a larger reinforcing plate 27, which latter is in turn welded to the outer faces of the side walls strips 15, 16, corner plates 10, and cross-connecting inserts 22, 23, thereby making for rigidity and strength and at the same time minimizing weight of the structure. The body of the bucket is further reinforced by the provision of a curved plate 28 at the rear portion thereof, said plate being welded to the upper faces of the adjacent portions of the longitudinal bottom strips 7 and to

the particular inserts 21 located thereunder. This plate 28, of course, is of minimum area so as not to unduly restrict the open-work effect of the main body structure, yet affording ample scooping surface for facilitating the gathering of the material at the rear portion of the bucket as it is taken in at the front portion during the dragging of the bucket in the operation thereof. The edge portions of the plate 28 are bevelled, as at 29, to avoid abrupt shoulders.

A bar 30 of round cross-section, as shown, or of any other suitable or approved form, is preferably provided on the rear portion 4 of the side wall strip 2, to serve as a wear-resistant element for sliding and erosive contact of the bucket lifting and dumping cables or chains as usually employed in the use of the bucket, said element 30 also serving to materially stiffen said portion 4 of the strip 2. This element 30 is welded in place in keeping with the method by which the general structure is fabricated as herein set forth.

The details of the hood portion 3 will now be described. As shown, this portion of the bucket comprises the hereinbefore mentioned inner plate 5 which is of substantially U-shape, the upper end or leg portions 5^a being straight and flush with the body side strips 2, 15, and 16, while the intermediate portion extending across the bottom of the forward portion of the bucket is dipped roundingly, as at 5^b, and being flush with the ends of the corner plates 10, but underlying the extended end portions 7^a of the bottom strips 7 which are welded flatwise thereto. A second inner plate 31, of substantially inverted U-shape, is located forward of said first mentioned inner hood plate 5, flush therewith and the vertical edges of the lower end or leg portions of said plate 31 being welded to the meeting upper end or leg portions of said plate 5, as shown more clearly at 31^a in Figure 3 of the drawings. The intermediate portion 31^b of this plate 31 is arched roundingly over the forward portion of the bucket to constitute a hood-like yoke, on top of which are welded a spaced pair of angle members 32, apertured as at 33, to afford brackets for the attachment of a lifting cable or chain as is generally applied in the use of a bucket of the character of the present invention.

The hood portion 3 of the bucket further comprises outer reinforcing plates 34 located on opposite sides of the structure, the middle portions 35 of said plates 34 being widened considerably, longitudinally of the bucket, the lower portions 36 being narrowed to a width corresponding that of the plates 5 and terminating in a plane near that of the upper edges of the body corner plates 10, and the rear upper edges of said plates 34 tapering, as at 37, to their extreme upper edge portions 38 which are of a width substantially that of the intermediate arched portion 31^b of the hood plate 31. The overlapped portions of said plates 5, 31 and 34 are preferably spot-welded together, as well as where they meet edgewise.

The forward bottom portion of the bucket is further reinforced by outer flat bars 39, 40, and interposed filler bars 39^a and 40^a, as shown more clearly in Figures 3 and 4 of the drawings. The filler bars 39^a and 40^a are welded flatwise to the overlying outer face of the intermediate portion 5^b of said inner hood plate 5 and their end portions are welded edgewise to the meeting edges of the portions 36 of said outer hood reinforcing plates 34. The outer bars 39, 40, are in turn welded flatwise to said filler bars 39^a and 40^a, and their extreme end portions overlap and are welded flatwise to the lower edge portions 36 of said hood reinforcing plates 34.

The hood structure thus far described is obviously of relatively light weight, yet rigid and strong. However, it is preferable to further reinforce the hood by securing on the inner side of the hood plate 31, a series of abutting and joined segmental, curved, plates 41, to produce a light-weight tubular, reinforcement without an abrupt shoulder or protuberance to interfere with the entrance of material into the bucket in the operation thereof. In practice, it is preferable to weld these segmental pieces 41 edgewise together and flush with each other throughout, in order to have a relatively smooth, rounded, outer surface, the end edge portions of said pieces, of course, being also welded smoothly to said plate 34. This produces a strong, arched yoke which braces the upper forward portions of the side walls of the bucket and affords a strong support for the lifting brackets 32.

The hood portion 3 of the bucket is also provided, at each side, with forwardly extending brackets for the obvious attachment of the drag cable or chain (not shown). As shown, these brackets each comprise a plate 42, which, in the blank, is slotted longitudinally as at 43, the plate being then bent in the region of the slot to produce a pair of spaced loops or eye portions 44 for the attachment of the cable or chain, as the case may be, and the end portions of the plate being lapped over and welded to the adjacent portions of the plates 31 and 34, as clearly shown in Figures 1, 2, and 3 of the drawings. The structure is further reinforced by half-round hollow members 49 which are welded at their forward ends 50 to said plates 42 and at their side edges to the outer hood plates 34 longitudinally rearward of said plates 42.

The front edge portion of the bottom and adjacent side portions of the bucket are bevelled, as at 45, to afford a sharp cutting edge, and extending forwardly and at an incline downwardly from the bottom cutting edge are a series of digging teeth 46. These teeth, as shown, comprise longitudinal bars 47 which are welded to the under sides of the reinforcing bars 39, 40, with their protruding end portions turned downwardly, as at 48, to constitute the main body portions of the teeth. The teeth further comprise the forward end portions 7^a of the bottom strips 7 of the main body structure of the bucket, said portions 7^a being, as hereinbefore described, welded flatwise on the upper face of the bottom portion 5^b of said inner hood plate 5, and extended forwardly and downwardly therefrom as at 7^b upon the projected portions 48 of said bars 47, to which they are welded flatwise throughout to form an integral, solid, tooth structure. Where the strip portions 7^a cross the bottom plate portion 5^b their side edges are preferably bevelled, as at 7^c, and also along the seams 13 where in slightly raised relation they join the bottom flanges of the body corner plates 10.

From the foregoing description in connection with the illustrative drawings, it is obvious that a practical light-weight, yet strong and durable structure is produced, which is highly efficient in operation for the digging and handling of materials of various kinds, and in either a dry or wet condition, the open-work body structure facilitating quick drainage in digging and excavating operations under water and even to the handling of gravel, crushed rock or minerals, and other small particled material. So, too, the interior

formation of the bucket is such that the contained material is readily dumped therefrom in the usual manipulation of the bucket.

Obviously, the structure may be modified in many respects without departing from the spirit and scope of the invention as defined by the appended claims. The invention, therefore, is not limited to the specific construction and arrangement shown in the accompanying drawings.

What is claimed is:

1. An open-work drag bucket structure having apertured bottom, side and rear walls, the bottom inclining downwardly forward and merging roundingly with the rear wall, and an imperforate reinforcing and scooping plate fabricated in the structure by integrally welding it on the inner face of said roundingly merging bottom and rear wall portions, said plate extending the entire width of the bottom of the bucket.

2. In a drag bucket structure, a body portion proper, and a hood-like yoke portion at the forward part of the structure, said yoke portion being arched from side wall to side wall of the structure and being formed hollow with flat outer wall and transversely curved inner wall and having relatively sharp front and rear edge portions.

3. The herein described hood-like yoke structure, comprising an arched plate member, and a series of curved segmental plates formed to abut edgewise and produce with said arched plate member a tubular structure, said segmental plates being welded edgewise together and at their ends to said arched plate member.

4. In a drag bucket structure, in combination with the body portion proper, a hook-like yoke portion at the forward part of the structure comprising an arched outer plate and a series of curved segmental inner plates abutting each other edgewise to form, when joined together and with said outer plate, a tubular structure, said segmental plates being welded edgewise together and at their ends to said outer plate.

5. A drag bucket structure comprising an open-work body portion proper and a closed forward bottom portion, the open-work portion comprising longitudinal bottom strips extended forwardly across said closed forward bottom portion and being welded thereto, and teeth projecting forwardly from said closed forward bottom portion of the bucket, said teeth comprising longitudinal bars secured on the under side of said closed forward bottom portion and projecting therebeyond, said bottom strips being also extended beyond said closed forward bottom portion and secured integrally with the projected portions of said teeth bars.

6. The herein described open-work drag bucket structure, comprising spaced longitudinal body strips and spaced cross-connecting pieces, fabricated in an integral structure, a forward closed body and hood portion comprising overlapped plates, the intermediate part of said hood portion being arched from side wall to side wall of the structure, and a series of adjoining curved segmental plates forming with said arched intermediate part and adjacent side wall part of said hood portion a tubular structure.

7. A drag bucket structure of the character described, comprising a main body portion and an integrally welded hood-like yoked forward portion bracing the forward side walls of the main body portion, said hood-like yoked portion including plates at its ends widened and constituting parts of the side walls, and drag-line securing elements on the forward portion of the structure, said elements each comprising a medially slotted plate rebent to provide a spaced pair of loops, the end portions of the plate being opposedly lapped on opposite faces of the adjacent side wall portion of the structure and secured thereto by integrally welding the parts, and a reinforcing element of hollow half-round cross section secured at its forward end portion to the plate portion of the drag line securing element by integrally welding the parts and secured throughout its length by welding it marginally to said side wall portion longitudinally rearward of said drag line securing element.

LEWIS A. PRICE.