Sept. 23, 1947. W. S. BURDICK ET AL 2,427,897

EXCAVATOR DIPPER CONSTRUCTION

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Fig. 1

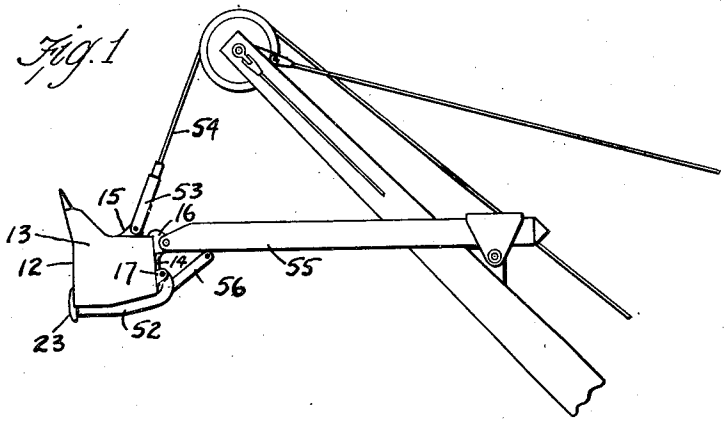
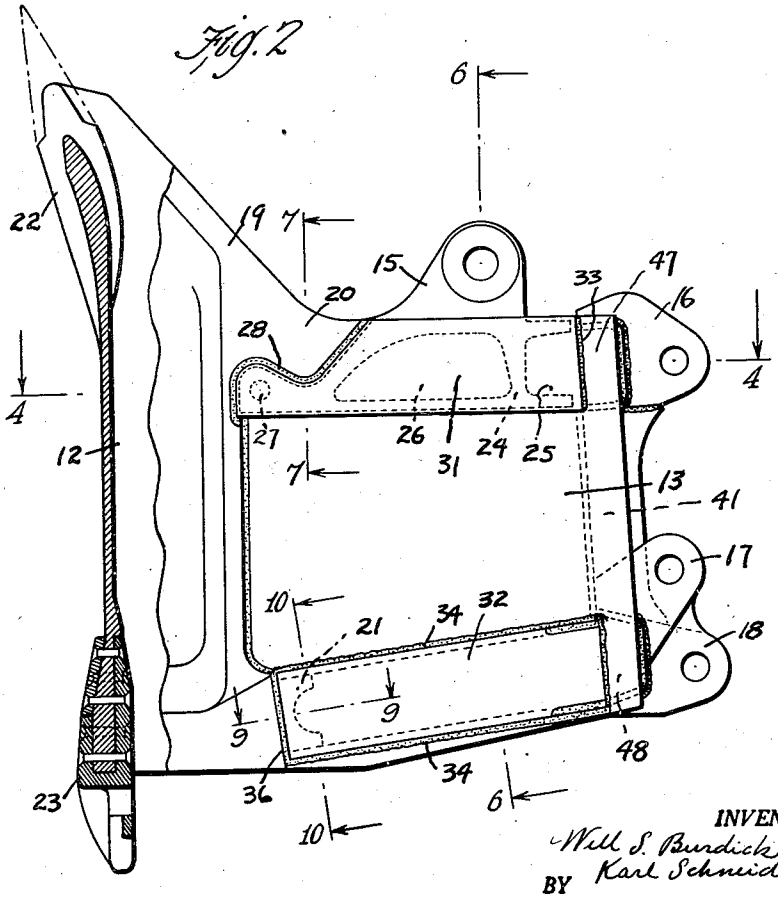


Fig. 2



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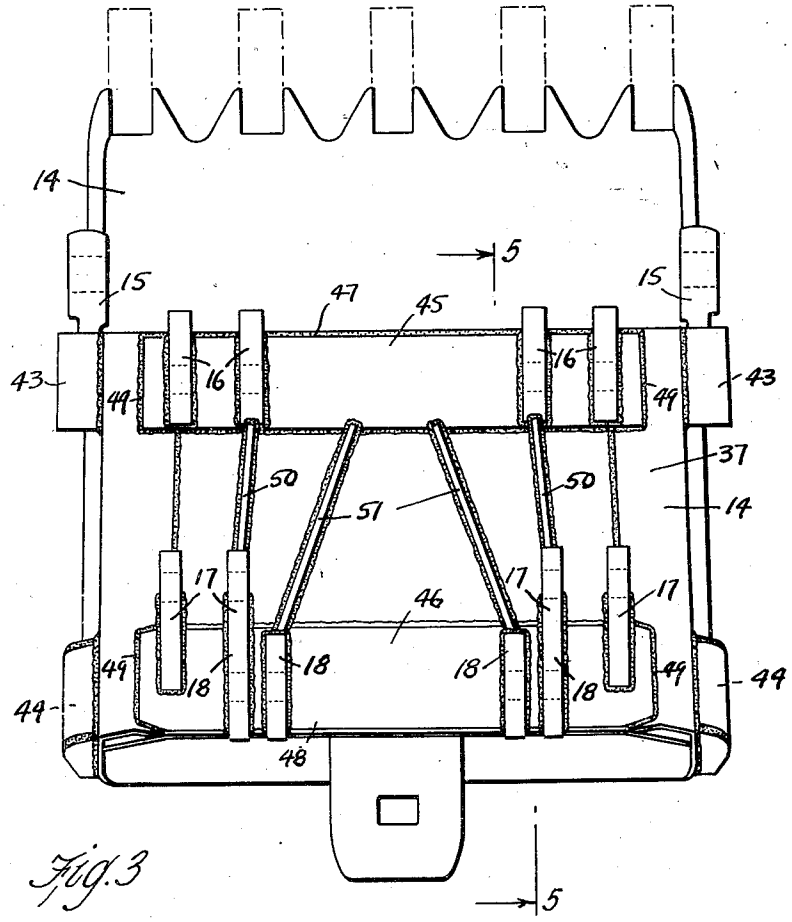


Fig. 3

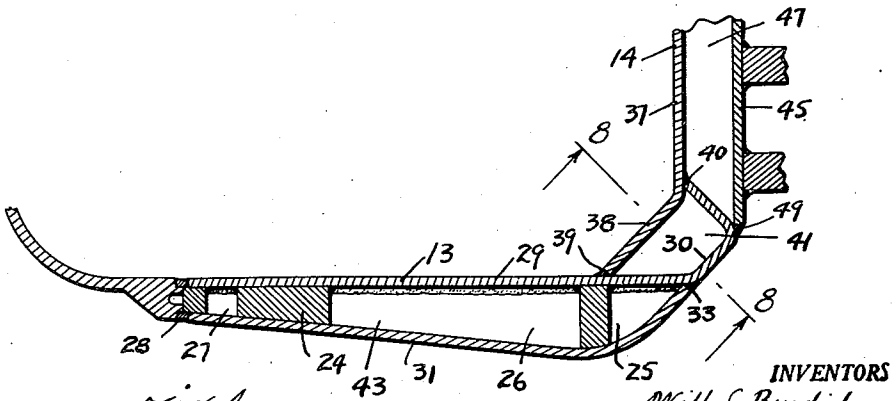


Fig. 4

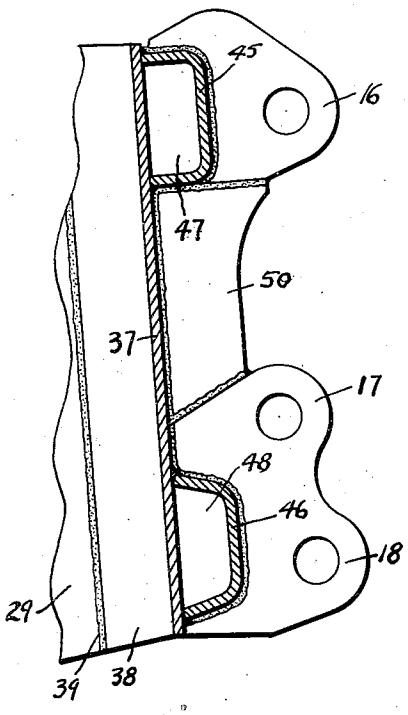
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EXCAVATOR DIPPER CONSTRUCTION

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Fig. 5



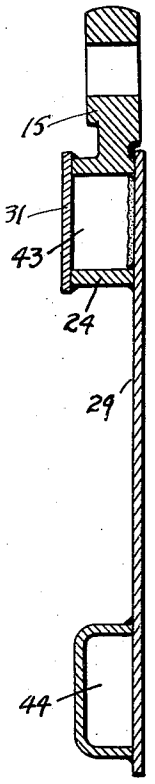


Fig. 6

Fig. 7

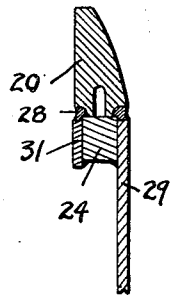


Fig. 8

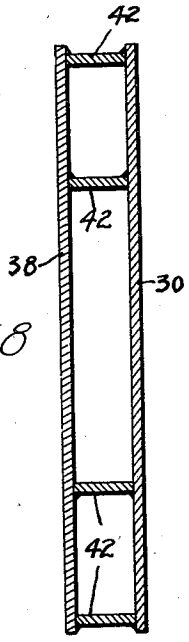


Fig. 9

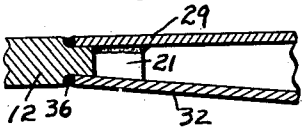
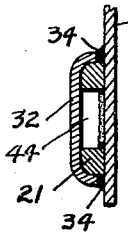


Fig. 10



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UNITED STATES PATENT OFFICE

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EXCAVATOR DIPPER CONSTRUCTION

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9 Claims. (Cl. 214—145)

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The invention relates to excavator dippers.

The general object of the invention is to provide a dipper of the fabricated type formed of plates and channels welded together and to the manganese front, bail, stick, brace, and door hinge lugs to provide a strong but relatively light weight dipper.

One of the objects of the invention is to provide an S-shaped joint connection between the manganese front, the bail castings, side plates, and a cover plate for upper side box sections to provide a very strong connection between these members to relieve the stress in the welded joint, all members adjoining said front at this S-shaped joint being welded individually to said front.

A further object of the invention is to provide a dipper having a back plate which is bent forward on both sides to form gradual corners at the dipper back, these corners preferably tapering from the top to the bottom of the dipper, so that the larger corner portions are at the top and the smaller at the bottom of the dipper for easier and cleaner dumping performance.

A further object of the invention is to provide a dipper with corner sections formed by bending the back ends of the side plates to form channel sections reinforcing the corner portions of the back plate, the dipper back plate at its outer vertical edges and at the bend lines being welded in two duplicate joints to the side plates with the bend margins of the back plate and the channel sections of the side plates forming vertical box sections at the corner portions of the dipper back.

A further object of the invention is to provide a dipper with vertical box sections at the corner portions of the dipper back joined at the top and bottom portions of the dipper to horizontal box sections at the sides and back of the dipper so as to obtain an exterior framework around the dipper to reinforce the same and secure a more satisfactory distribution of severe digging loads.

A further object of the invention is to provide a dipper having vertical box sections provided with horizontal diaphragms at such levels as to make the horizontal sides of all box sections around the entire dipper at both top and bottom thereof continuous.

A further object of the invention is to provide a dipper front having prongs or lugs at its lower end welded to the sides of the dipper for extra strength in the tie between said front and dipper body.

The invention further consists in the several features hereinafter set forth and more particularly defined by claims at the conclusion hereof.

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In the drawings:

Fig. 1 is a conventional view of a dipper of the shovel type showing its connections with the dipper stick and boom;

Fig. 2 is a side elevation view of a dipper embodying the invention, parts being broken away and parts being shown in section;

Fig. 3 is a back elevation view of the dipper;

Fig. 4 is a detailed horizontal sectional view taken on the line 4—4 of Fig. 2;

Fig. 5 is a detailed vertical sectional view taken on the line 5—5 of Fig. 3;

Fig. 6 is a detailed vertical sectional view taken on the broken line 6—6 of Fig. 2;

Fig. 7 is a detailed vertical sectional view taken on the line 7—7 of Fig. 2;

Fig. 8 is a detailed vertical sectional view taken on the line 8—8 of Fig. 4;

Fig. 9 is a detailed horizontal sectional view taken on the line 9—9 of Fig. 2;

Fig. 10 is a detailed vertical sectional view taken on the line 10—10 of Fig. 2.

Referring to the drawings, the numeral 12 designates the dipper front, 13 the sides, 14 the back, 15 the hoist rope bail castings, 16 the stick pin connection, 17 the door hinges, and 18 the dipper brace link connectors.

The dipper front casting 12 is a one piece manganese steel casting having side portions 19 with projecting portions 20 and 21 at the top and bottom thereof and the usual replaceable teeth 22 suitably secured thereto and a door latch keeper 23 riveted thereto.

Each bail casting 15 has a base portion 24 which extends almost the length of the side of the dipper and is recessed at its rear end 25 at its central portion 26 and at its front end 27. The front end of each bail casting makes what we term an S-shaped joint 28 with the mating end portion 20 of the front 12 and is welded thereto along this joint.

The sides 13 are formed of fabricated steel plates 29, whose back portions are bent to form vertical channel sections 30, and top and bottom cover plates 31 and 32. The front ends of the side plates 29 are welded to the sides of the dipper front 12 as are also the front ends of the cover plates 31 and 32, see Fig. 4. The base portion 24 of each bail casting 15 is welded at its recessed portion 27 and at its lower edge, see Fig. 7, to its side plate 29. The top cover plate 31 is also welded along its bottom edge to the base portion 24 and at its back edge 33 is welded to the web of the channel section 30, see Fig. 4.

Each bottom side cover plate 32 is of channel section as shown in Fig. 10 and is welded at its side edges 34 to its side plate 29.

The projecting portion 21 of the front is a V- or U-shaped form and is welded as shown in Fig. 10 at 35 to the side plate 29 and is welded to the front end 36 of the bottom side cover plate 32.

The back 14 includes a fabricated steel plate 37 having forwardly bent corner portions 38 which are welded at their front edges to the side plates 29 as shown at 39 in Fig. 4 and which are welded to the rear edges 40 of the back portions of channel sections 30 to form vertically disposed box sections 41. Diaphragms or brace plates 42 are welded to the sides of each box section in planes alined with the tops and bottoms of the side box sections 43 and 44 formed by the side plates and their cover plates as heretofore described, and are shown in Fig. 8.

The back also includes top and bottom horizontally disposed steel channel sections 45 and 46 whose edges are welded to the back of the back plate 37 as shown in Fig. 5 to provide horizontal box sections 47 and 48 which are alined respectively with the side box sections 43 and 44, so that box sections extend continuously around the sides and back of the dipper, the ends of the channel sections 45 and 46 being welded to the webs of vertical box sections 41 as shown at 49 in Fig. 4.

The dipper stick pin mountings 16 are steel blocks or casting welded in spaced pairs to the box section 45, see Figs. 3 and 5.

The door hinge lugs 17 are steel blocks or castings welded in spaced pairs to the box section 46, and the inner ones of these pairs of blocks also form one of the dipper brace link connectors 18 as shown in Figs. 3 and 5. The others of the link connectors 18 are short steel blocks welded to the box section 46 as shown in Fig. 3.

Stiffening plates or ribs 50 are welded to the back plate 37 and to inner pivots 16 and the inner sets of hinge lugs 17 as shown in Figs. 3 and 5 and similar plates 51 are welded to said back plate, the inner blocks 18, and the box section 45 as shown in Fig. 3.

A dipper door 52 of any suitable construction may be mounted on the hinge lugs 17 and be provided with the usual operator controlled latch to engage in the keeper or latch plate 23.

As shown in Fig. 1, the bail 53 for the hoist rope 54 is pivotally connected to the bail castings 15, the dipper stick 55 is connected to the pin mountings 16, and brace links 56 are operatively connected to the connectors 18 and the dipper stick.

We desire it to be understood that this invention is not to be limited to any particular form or arrangement of parts except in so far as such limitations are included in the claims.

What we claim as our invention is:

1. In a dipper, the combination of a dipper front casting, bail castings having base portions having an S-shaped line butt welded connection with said front casting, and side plates also butt welded to said castings along said S-line and to said base portion lengthwise thereof.

2. In a dipper, the combination of a dipper front casting, bail castings having base portions with an S-shaped line butt welded connection with said front casting, side plates also butt welded to said castings along said S-line and to said base portion lengthwise thereof, and cover plates for said bail castings welded thereto lengthwise thereof and butt welded to said front casting along said S-line.

3. In a dipper, the combination of a dipper front casting, and bail castings, side plates and cover plates for said bail castings cooperating therewith and with said side plates to form upper side box sections, all of the parts forming said box sections being individually welded to said front casting at their adjoining edges.

4. In a dipper, the combination of a back plate having forwardly inclined side margins, and side plates having their rear portions formed to provide channel sections, said channel having welded connection with said side margins to form vertically disposed box sections at the corners of the dipper.

5. A dipper having sides and a back formed of metal plates welded together to provide vertical box sections at the corners and horizontal upper and lower box sections at the sides and back of the dipper welded to said vertical box sections.

6. A dipper having sides and a back formed of metal plates welded together to provide vertical box sections at the corners and horizontal upper and lower box sections at the sides and back of the dipper welded to said vertical box sections, said vertical box sections having horizontally disposed plates welded thereto in planes coincident with the tops and bottoms of said horizontal box sections to make continuous box sections around the entire body of the dipper.

7. In a dipper, the combination of a dipper front casting having projecting pronged portions at its lower end, side plates welded to said pronged portions, and cover plates for the lower portions of said side plates welded thereto and to said front casting and enclosing said pronged portions.

8. In a dipper, the combination of a dipper front casting having side projections at its top and bottom portions, side plates having a welded joint connection with said projections, and cover plates cooperating with said side plates to form horizontal box sections at the upper and lower portions of the sides of the dipper having welded joint connection with said projections bail castings having welded joint connections with said front casting, said side plates, and the cover plates at the upper portions of the side plates.

9. In a dipper, the combination of a dipper front casting, side plates having welded connection with said casting, bail castings having base portions substantially coextensive with said side plates and having welding connections therewith and with said front casting, parts of said welding connections being formed between apertured portions of said bail castings and said side plates.

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KARL SCHNEIDER.

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