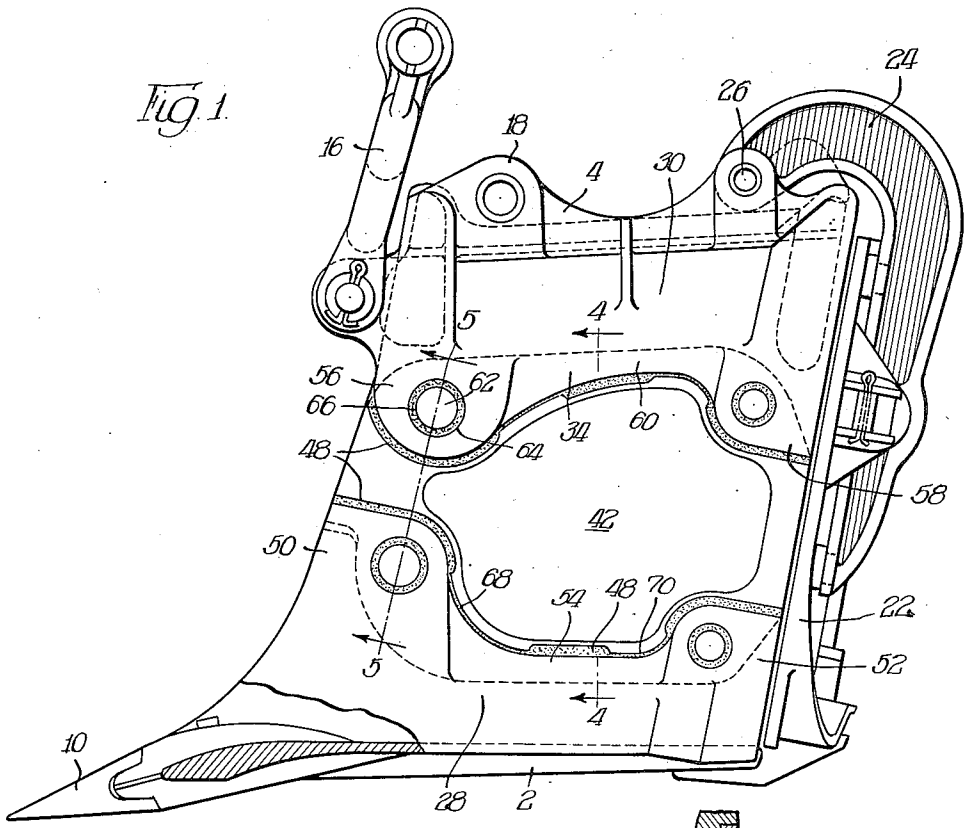
Dec. 14, 1943. L. T. HARRIS ET AL 2,336,729

EXCAVATING IMPLEMENT

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Fig. 1.



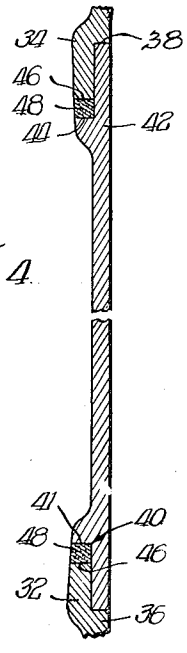


Fig. 4.

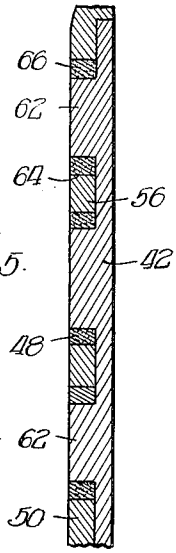


Fig. 5.

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Fig. 2.

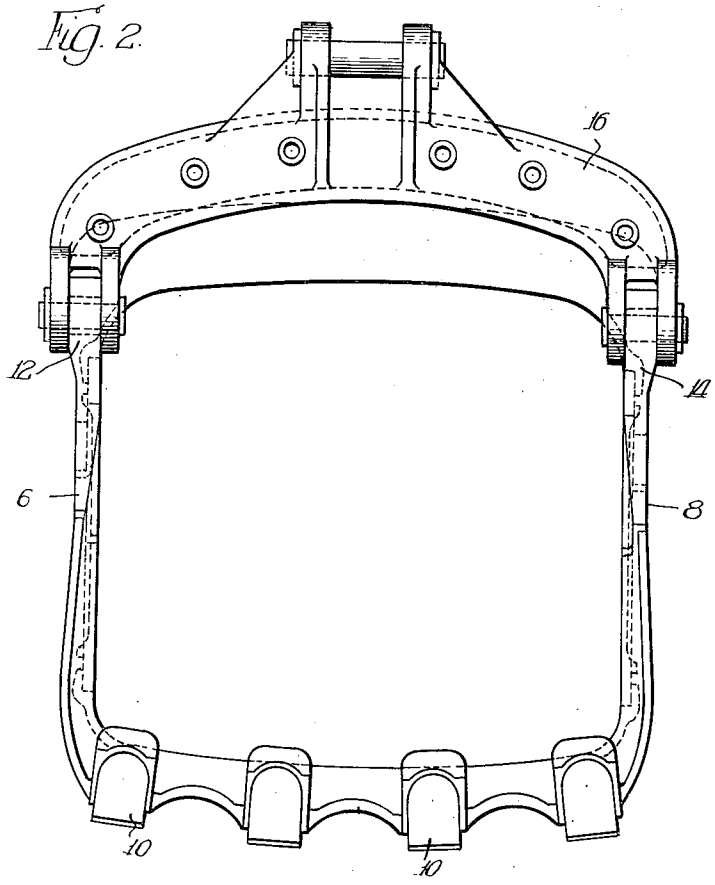
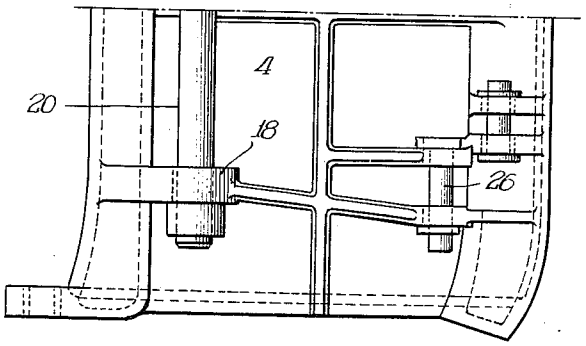


Fig. 3.



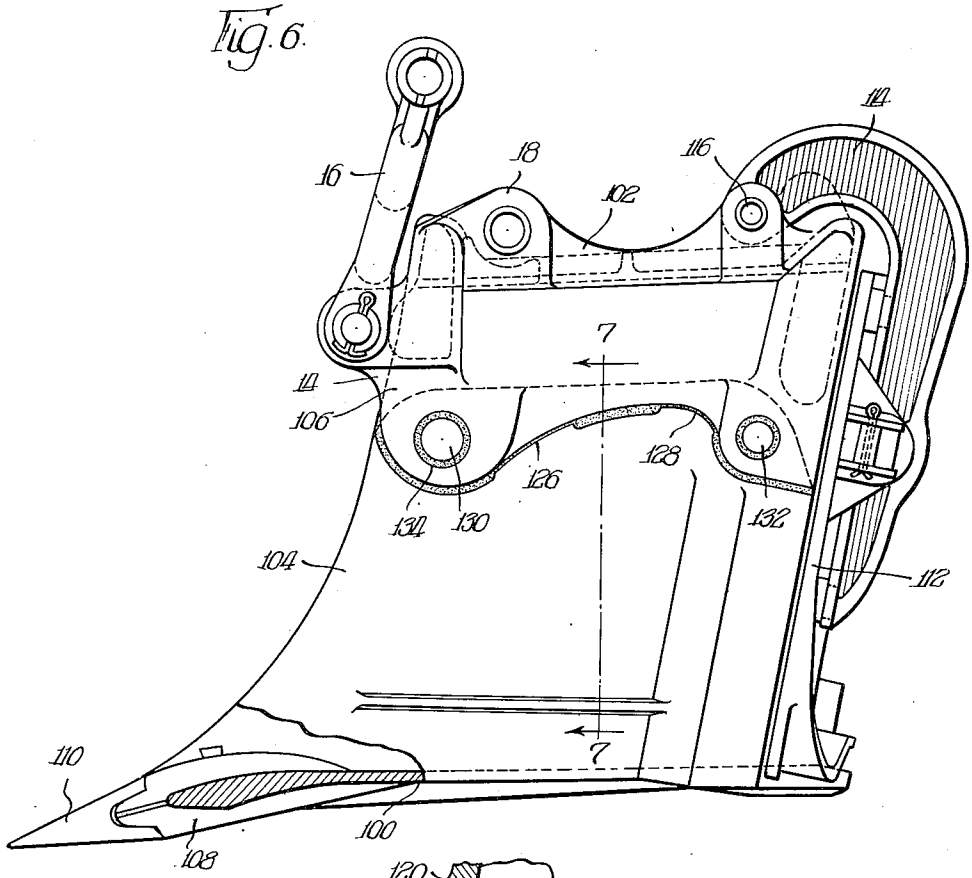
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EXCAVATING IMPLEMENT

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Fig. 6.



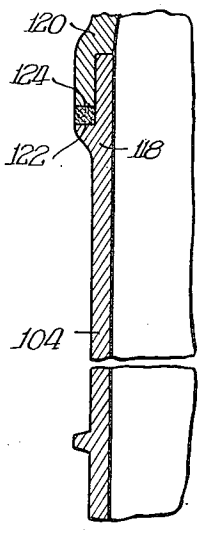


Fig. 7.

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Patented Dec. 14, 1943

2,336,729

UNITED STATES PATENT OFFICE

2,336,729

EXCAVATING IMPLEMENT

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Application December 7, 1942, Serial No. 468,078

13 Claims. (Cl. 214—145)

The present invention relates to excavating apparatus and more particularly to the body construction for a dipper or the like, and is a continuation-in-part of application Serial No. 452,470, filed July 27, 1942, for Excavating implement.

Among the objects of the present invention is to provide a body construction for an excavating implement which, while having the capacity to function efficiently in a conventional manner, will be of comparatively light weight, simple and cheap in construction, and free from internal resistance to loading and discharge, and having a comparatively smooth exterior that minimizes obstruction to penetration of the material excavated.

More particularly the objects set forth above are assured by providing a body of multi-part construction for an implement of the type herein disclosed including a front, a back and side members, and in which the parts are provided with interfitting shouldered rabbetted margins serving as mediums of transmission of digging thrust and involving novel features of welding construction in the manner of their connection that renders the welds particularly durable in service, while all the structural features combine to produce a one-piece body particularly adapted for assuring the results herein contemplated.

The present invention further includes as an object the provision of a body structure for an excavating implement in which the parts are designed with thickened margins affording rabbetted connections having interengaging shoulders positioned to transmit thrust in the planes of the parts, and in which certain of the opposed shoulders are provided in spaced apart relation to form channels or grooves that give form to the weld fillets and insure ample dimensions of said fillets, and so present them between pairs of shoulders that the same are under compression in the transfer of thrust as distinguished from being in shear as in the case of a fillet deposit upon a plane surface to provide a shoulder in the path of a metal edge.

Another object within the purview of the present invention is to provide a novel body structure for exacavating implements in which the separately formed parts have their spaced shoulders in circuitous or tortuous paths that distribute working stresses in different directions as the same are transmitted from one part to another.

As a still further object, the present invention involves the provision of lugs or bosses on one of the parts of the body construction adapted to be received in sockets in another of the parts thereof and forming grooves adapted to receive weld material, the said lugs and sockets forming an aligning means during the assembly of the parts and when welded in the manner indicated transmit digging stresses between the parts so as to avoid placing the weld deposits between the said parts in tension, thus effectively providing for the severe working conditions to which an implement of this kind is usually subjected.

As one illustration, the present invention comprehends a body structure as immediately above described, in which the said front and back members are provided with end portions extending beyond the intermediate marginal portions, and in which the said plates have their marginal edges of such a contour as to conform to the contour of said front and back members so as to provide the interlocking keyed relation between the said members and to transmit the said working stresses through the said shoulders and the weld material deposited therebetween.

As a further illustration, the present invention contemplates a body structure of two-part construction in which the front and back members are provided with integral side extensions forming the sides of the completed assembly which are provided with interfitting rabbetted margins of circuitous formation so as to provide the interlocking keyed relation between the members and to transmit the said working stresses through the said shoulders and the weld material deposited therebetween.

Other objects, features, capabilities and advantages are comprehended by the invention, as will later appear and as are inherently possessed thereby.

Referring to the drawings—

Figure 1 is a view in side elevation of an excavating implement made in accordance with the present invention;

Figure 2 is a front view in elevation of the excavating implement of Figure 1 of the drawings;

Figure 3 is a fragmentary top plan view of the excavating implement of Figures 1 and 2 of the drawings;

Figure 4 is a fragmentary view in cross section taken in the plane represented by line 4—4 of Figure 1;

Figure 5 is a fragmentary view in cross section taken in the plane represented by line 5—5 of Figure 1 of the drawings;

Figure 6 is a view in side elevation of an al-

ternative form of construction for an excavating implement made in accordance with the present invention; and

Figure 7 is a fragmentary view in cross section taken in the plane represented by line 7—7 of Figure 6 of the drawings.

Referring now more in detail to the drawings, an excavating implement incorporating the novel features of construction according to the present invention is shown in the form of a dipper, having a front member 2, a back member 4, and interconnecting side plate members 6 and 8 to form a body structure in which the front member 2 is provided at its forward cutting edge with a plurality of teeth 10. The said dipper has its back member 4 provided with the lugs 12 and 14 to which is secured a bail 16 in pivotal relation thereto, and to which operating means may be connected. The back member 4 is further provided with spaced lugs 18 adapted to position the bolt 20 to which is connected a dipper stick for operating the said dipper. As is customary in an implement of this type, the said dipper is further provided with a door 22 having a plurality of operating arms 24 of the offset type which have their ends pivoted to the back member 4 as at 26. This door may be secured in locked position in any conventional manner.

The present invention is particularly directed to the formation of a welded dipper of manganese steel, for example, which is free from the conventional riveted construction, is comparatively light in weight, extremely simple and cheap in construction as compared to present day constructions, and is free of obstructions both on the interior and exterior, rendering the construction particularly adapted for efficient loading and discharge of material and facilitating the penetration of the material excavated by the said dipper.

To this end the present dipper construction involves the front and back members 2 and 4 which are provided with the confronting side extensions such as 28 and 30, and each of which is provided with the rabbetted marginal portions such as 32 and 34 having the shoulders 36 and 38. The rabbetted marginal portions are adapted to receive the side plates which have their marginal portions thickened and provided with rabbetted portions such as 40 and 42 adapted to interengage with the shoulders 36 and 38 of the front and back members, and in turn providing shoulders 44 spaced in respect to the shoulders 46 of the front and back members to form grooves adapted to receive weld deposits 48 for securing the said members together.

More particularly, the extensions 28 and 30 of the front and back members respectively, have their marginal portions thickened to provide the rabbetted marginal edges and, as shown in the present embodiment, the side extensions of the front member 2 have their end portions as at 50 and 52 of increased thickness as compared to the intermediate portions therebetween, and which end portions likewise extend beyond the intermediate rabbetted marginal portion 54. Likewise, the side extensions 30 of the back member 4 have their end portions 56 and 58 of increased thickness as compared to the intermediate portions therebetween, and the said end portions extend beyond the rabbetted marginal portion 60 therebetween.

The dipper construction further embodies the provision of a plurality of lugs or bosses such as 62, formed integral with or provided as separate elements on the side plates and which are received within the sockets 64 of the end portions of the front and back members to provide means for aligning the several members for assembly purposes, and to likewise provide spaced shoulders for receiving weld deposits 66 for interconnecting the said members together.

It will be quite apparent that the weld deposits 48 and 66 are under compression at all times for the transmission of stresses from one member to the other, thus providing a strong and durable assembly which is assured long life under the severest of conditions. The said side members may be further provided with the positioning pads such as 68 and 70 which give form to restricted grooves or channels with the opposed shoulder of the adjacent members, and which assure proper flow of weld metal between the same and further serve to effectively interlock the said members together. The general formation of the marginal contour for the opposed shoulders of the side, front and back members is such as to key the side members to the said front and back members to effectively transmit the stresses to which the same is subjected.

Another form of construction for the excavating implement in accordance with the present invention is shown in Figures 6 and 7, which discloses a dipper assembly comprising the front member 100 and back member 102, the former being provided with side extensions such as 104, and the latter of which is provided with side extensions such as 106, and both being of substantially U-shaped construction. The front member 100 is further provided with seating means 108 along its forward cutting edge to receive a plurality of digging teeth such as 110. The back member 102 is provided with means conforming substantially to the means of Figure 1 of the drawings, to attach the dipper stick thereto, such means being identified by the reference numerals used in describing such elements in the first embodiment. The present embodiment is also provided with the door 112 closing the opening at the rear of the dipper formed by the members 100 and 102, the said door being hinged to the back member 102 by a plurality of operating arms 114 of the offset type, which have their ends pivoted to the back member 102, as at 116.

As in the first illustrative embodiment of the invention, the dipper is of multi-part construction having the parts thereof connected by weld joints to secure the assembled excavating implement. While the first-named embodiment has separate side members, the same type of dipper construction can be secured as in the present illustrative embodiment by providing rabbetted joints between the side extensions of the front and back members of the dipper. Accordingly, the present illustrative embodiment of the invention comprehends the provision of rabbetted marginal portions such as 118 and 120 on the side extensions 104 and 106, respectively, which when interfitted together form the opposed shoulders 122 and 124 defining a groove or channel which is adapted to receive a weld deposit for securing the elements of the dipper construction together. As in the previously illustrated example of the invention, the weld deposit is under compression at all times for the transmittal of working stresses between the front and back members, and the said marginal portions of the said extensions are so formed as to provide a circuitous or tortuous path for the

said groove or channel between the said marginal portions. This formation of the grooves results in the same novel results secured in the previously illustrated example of the invention, and as hereinbefore set forth and defined, the groove may be further characterized by the provision of positioning pads such as 126 and 128.

The present embodiment is further identified in a manner similar to the first illustrative example of the invention by the provision of lugs such as 130 and 132, which may be formed integrally with the side extensions of either of the two members forming the dipper, or which may be formed separately and welded or otherwise connected thereto. These lugs in the present embodiment are shown as being part of the side extensions 104, and the same are received in the sockets such as 134 provided in side extensions 106, the said sockets being of such size as to form opposed shoulders to the shoulders provided by the lugs, so as to reserve an annular space therebetween for the reception of weld material to further secure the members of the dipper assembly together. These lugs have the dual capacity of providing a securing means as well as to assist in the assembly of the structure in the initial steps of assembly.

The present invention, therefore, has a number of novel features particularly contributing to the results desired without providing a conventional dipper frame, among which is the provision of a dipper or the like of multi-part construction wherein the parts are provided with margins united together by rabbetting and welding, and in which the transmission of digging forces from the back to the front is in the form of thrusts in the planes of the several walls of the members and through shouldered weld seams that put the weld material under compression as distinguished from lap weld seams involving fillets of metal put under shear by the digging stresses.

Further novel features involve the provision of utilizing the shoulders of the rabbet joints to define channels in which the weld metal is molded in position to transmit and receive as a load of compression the working stresses from the back to the front through the side walls of the assembly.

In addition, the invention provides for the opposed spaced shoulders in circuitous or tortuous paths that distribute working stresses in different directions as they pass from one part to another and thereby reduce any tendency to check.

Also as a further characterization of the present invention, the rabbetted faces are positioned upon one another and proper spacing of the groove forming shoulders maintained pending welding, by means of the bosses or lugs provided on certain of the parts received in the sockets in other of the parts. In addition, the construction embodies the provision of positioning pads to assure proper seating of the meeting faces and flow of weld metal between them so as to effectively lock the said parts together.

While we have herein described and upon the drawings shown an illustrative embodiment of the invention, it is to be understood that the invention is not limited thereto but may comprehend other constructions, arrangements of parts, details and features without departing from the spirit of the invention.

What is claimed is:

1. An excavating implement comprising a body of multi-part construction including a front, a back and side members and in which the said parts are provided with interfitting shouldered rabbetted margins of circuitous formation, and weld deposits for securing said parts provided between the spaced shoulders of said rabbetted margins.

2. An excavating implement comprising a body of multi-part construction including front and back members having confronting side extensions provided with rabbetted margins, side members having rabbetted margins interfitting with the rabbetted margins of said extensions, the said interfitting rabbetted margins having opposed shoulders defining grooves between said members, and a weld deposit within said groove for securing said members in assembled relation.

3. An excavating implement as defined in claim 2, in which the said opposed shoulders are disposed in circuitous paths for distribution of working stresses from one of said members to another.

4. An excavating implement as defined in claim 2, in which the end portions of said confronting side extensions extend beyond the intermediate marginal portions to provide circuitous paths for said opposed shoulders for interlocking said members and for distribution of working stresses from one to another.

5. An excavating implement as defined in claim 2, in which the end portions of said confronting side extensions extend beyond the intermediate marginal portions to provide circuitous paths for said opposed shoulders for interlocking said members and for distribution of working stresses from one to another, and in which the side members are provided with lugs fitting within sockets formed in said extensions to form channels adapted to receive weld deposits to secure additional interlocking relation of said members.

6. An excavating implement as defined in claim 2, in which the end portions of said confronting side extensions extend beyond the intermediate marginal portions to provide circuitous paths for said opposed shoulders for interlocking said members and for distribution of working stresses from one to another, and in which certain of the shoulders forming the groove between said members are provided with raised pads providing restricted seatings between the faces thereof to assure flow of weld metal for interlocking said members.

7. An excavating implement comprising a body of multi-part construction including front and back members having confronting side extensions provided with rabbetted margins adapted to interfit with each other, said interfitting rabbetted margins having opposed shoulders disposed in circuitous paths defining grooves between said extensions, and weld deposits within said grooves for securing said members in assembled relation.

8. An excavating implement comprising a body of multi-part construction including front and back members having confronting side extensions provided with rabbetted margins adapted to interfit with each other, said interfitting rabbetted margins having opposed shoulders defining grooves between said extensions, said opposed shoulders being disposed in circuitous paths for distribution of working stresses from one of said members to the other, the side extensions of one of said members being provided with lugs fitting within sockets in the side extensions of the other of said members to form channels adapted to receive weld deposits to secure additional in-

terlocking relation of said members, and weld deposits within said grooves and channels for securing said members in assembled relation.

9. An excavating implement comprising a body of multi-part construction including front and back members having confronting side extensions provided with thickened rabbetted margins and which have their end portions extending beyond the intermediate marginal portions to provide circuitous marginal shoulders, side members having thickened rabbetted margins conforming generally to the contour of the margins of said extensions and interfitting therewith and having shoulders in opposed spaced relation to the shoulders of said extensions to form grooves between said members, and weld deposits within said grooves for securing said members in assembled relation.

10. An excavating implement as defined in claim 9 in which the said end portions of said extensions and the adjacent portions of said side members are of greater thickness than the intermediate portions therebetween.

11. An excavating implement as defined in claim 9 in which the said end portions of said extensions and the adjacent portions of said side members are of greater thickness than the intermediate portions therebetween, and in which said adjacent portions of said side members are provided with lugs fitting within said sockets in the end portions of said extensions to form channels adapted to receive weld deposits to secure additional interlocking relation of said members.

12. An excavating implement comprising a body of multi-part construction including front and back members having confronting side extensions, side members interfitting with said extensions, said extensions and side members being provided with shoulders forming grooves between said parts, and weld deposits having their dimensions defined by the spaced shoulders and being disposed so as to be under compression thereby in the transmission of thrust from one member to the other.

13. An excavating implement as defined in claim 12, in which the spaced shoulders are disposed in circuitous paths to interlock said members and to distribute working stresses in different directions in the transmittal thereof from one member to the other.

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