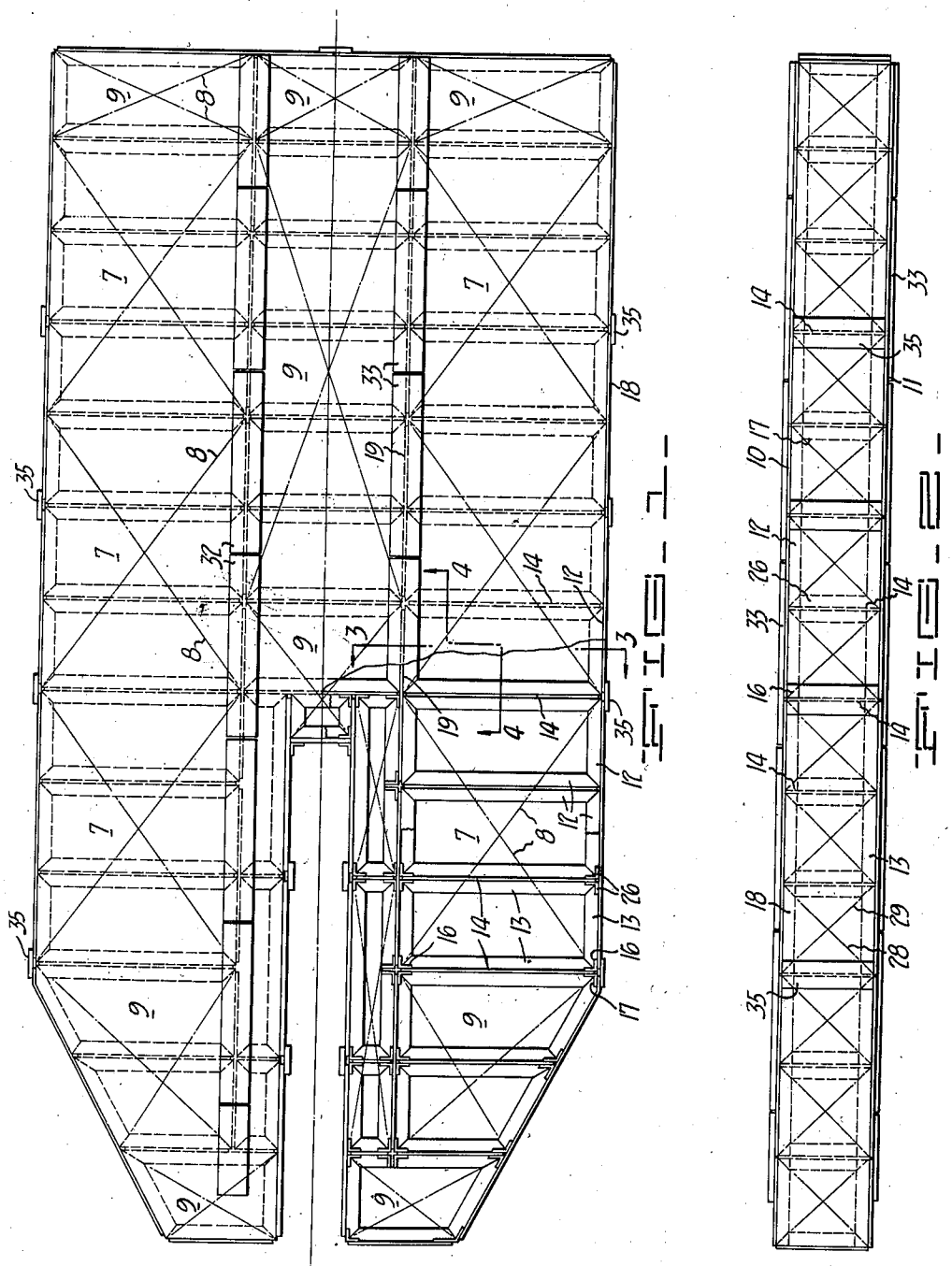
March 23, 1943. W. B. MACAULAY 2,314,624

DREDGE HULL

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INVENTOR
Walter B. Macaulay
BY
Marcus Sothrop

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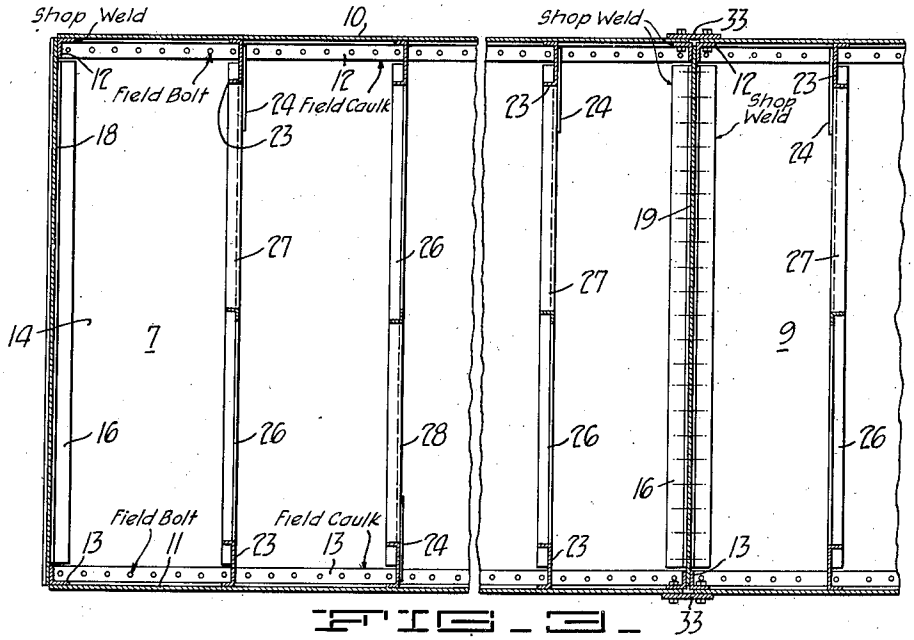



FIG. 3

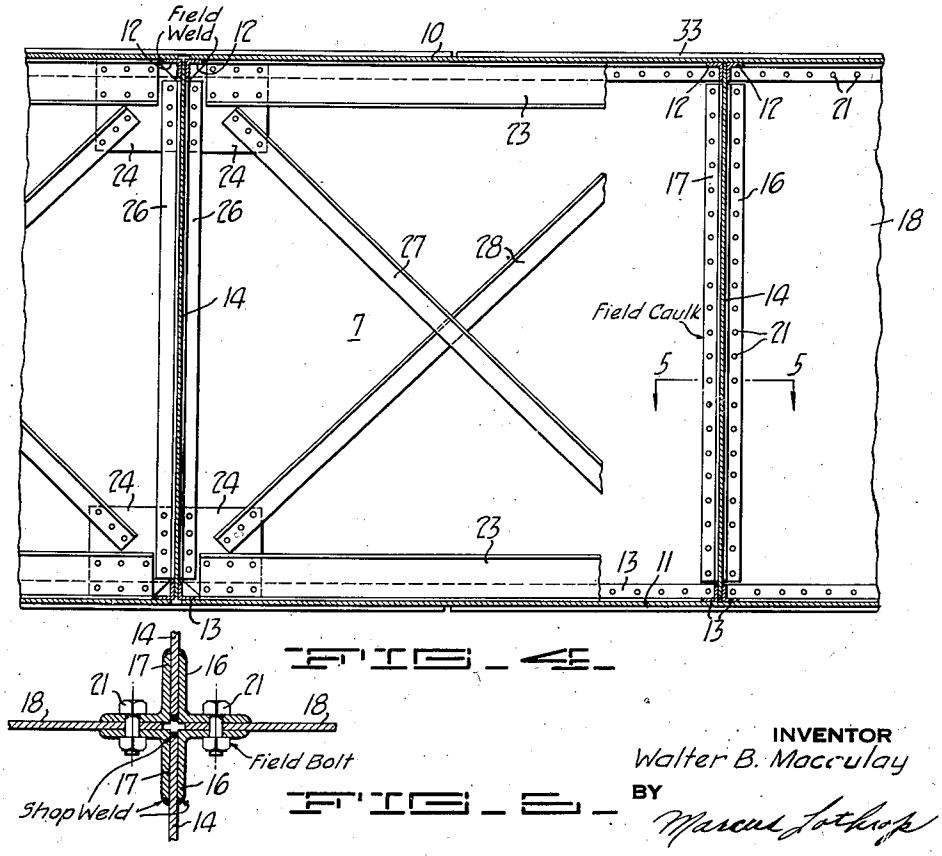



FIG. 4




FIG. 5

INVENTOR
Walter B. Macaulay
BY
Marcus Lothrop

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2,314,624

## DREDGE HULL

Walter B. Macaulay, Oakland, Calif., assignor to Yuba Manufacturing Company, San Francisco, Calif., a corporation of California

Application May 6, 1940, Serial No. 333,495

3 Claims. (Cl. 114—26)

My invention relates to boat hulls and is concerned particularly with dredge hulls especially useful on dredges of the general type referred to in my copending application entitled "Dredge hull," filed December 12, 1939, with Serial No. 308,835, now Patent No. 2,288,816 issued July 7, 1942.

Dredge hulls are customarily erected in part at a factory and in part in the field location where the finished dredge is to operate, and necessarily there are employed local field labor and local field facilities for completing the erection of the hulls. The first or factory part of the fabrication or erection is usually many, even thousands of miles away from the dredge field, and therefore there is often necessitated intermediate transportation by boat or rail, as well as by other means. While in my copending application above identified there is disclosed a dredge hull which is adapted peculiarly for Arctic final assembly, the problem concerned in the present instance is quite different, in that the dredge hull is primarily for assembly under tropical conditions.

In the tropics there is an abundant supply of labor but of an unskilled or only slightly skilled character. There is no particular limitation as to working time or season, but machine facilities and tool availability are practically non-existent. Furthermore, transportation to the tropical field site from the fabricating location is customarily by water, so that water transportation charges figure very largely in the cost of a dredge hull for tropical use. It is customary, in establishing marine rates for transportation, to calculate on the basis of one ton, but it is also calculated that whatever occupies forty cubic feet weighs a ton, so that it is most economical to have each forty cubic feet of volume packed as closely as possible with material for transportation.

The central factory labor involved in fabricating the dredge hull is usually paid at a high rate, because of its high degree of skill and because there is involved the use of a large amount of specialized fabricating machinery.

It is therefore an object of my invention to provide a dredge hull which requires but a small amount of initial skilled work at the central factory and which can be appropriately and economically transported to and assembled by unskilled or only slightly skilled labor at the field erection point.

Another object of my invention is to provide a dredge hull which is composed of component parts readily assembled under field conditions yet which can be economically shipped to the field.

Another object of my invention is to provide a dredge hull in which a large number of relatively unskilled operations can be carried on simultaneously.

The foregoing and other objects are attained in the embodiment of the invention illustrated in the drawings, in which—

Fig. 1 is a plan of a dredge hull constructed in accordance with my invention, a part of the structure being broken away to disclose an interior arrangement;

Fig. 2 is a side elevation of the dredge hull shown in Fig. 1;

Fig. 3 is a cross-section the plane of which is indicated by the line 3—3 of Fig. 1;

Fig. 4 is a cross-section the plane of which is indicated by the line 4—4 of Fig. 1; and

Fig. 5 is a cross-section the plane of which is indicated by the line 5—5 of Fig. 4.

In its preferred form, the dredge hull of my invention comprises a plurality of sections which are joined together to constitute the hull, each of the sections being made up of a top structural plate and a bottom structural plate, the plates having angle irons welded thereto around the edges to form pans which are arranged facing each other like the top and bottom of a box. The top and bottom plates constituting a section are transversely spanned by a plurality of cross-plates which have angle irons welded thereto at the vertical edges on both sides of the plate, the angle irons being fastened by removable means, such as nuts and bolts, to the adjacent side plates which complete the box or section.

While dredge hulls vary a good deal in design and proportion, there is disclosed herein a dredge hull which is typical of dredge hulls in general and which illustrates my invention. The dredge hull as shown in Fig. 1 is substantially rectangular in plan except for the bow which is beveled and which has a re-entrant portion. The general extent of the hull is divided into a plurality of sections, such as 7, all of which are substantially alike and each of which is designated in the drawings by cross broken lines 8. While in actual practice each of the sections 7 is preferably water-tight with respect to the remaining parts of the hull, still these sections are primarily convenient designations rather than mechanically separate entities as in my copending application above identified. Furthermore, in addition to the sections designated 7, there are certain sections, designated 9, which are of somewhat the same characteristics although they are special in that they are not precise duplicates of the sections 7.

A typical section 7 and part of an adjacent section 9 are shown in Fig. 3 in cross-section and include a pair of structural plates arranged substantially to define the top and bottom of a box. These plates include a deck plate 10, which is preferably a sheet of metal rectangular in contour, and a similar bottom plate 11. Welded around the margins of the top plate 10 are downturned angles 12 forming a pan, and similarly

welded around the margins of the bottom plate 11 are upturned angles 13 forming a facing pan. These welds are preferably made at the central fabricating plant conveniently with the use of jigs and fixtures.

Spanning the plates 10 and 11 and extending substantially transversely thereof at the ends and adjacent the center of the section, is a plurality of similar cross-plates 14, each of which is a sheet of metal generally planar and having a rectangular contour, the vertical edges of which are reinforced by a plurality of angle irons 16 arranged on one side of the plate and a similar plurality of angle irons 17 arranged on the other side of the plate. While the angle irons 16 and 17 can be secured to the plate 14 in a number of different ways, I prefer to weld them in place along the vertical edges of the plate, at the central fabricating plant, since such welding is an operation which can best be carried on there. The positioning of the angles 16 and 17 on the plate 14 can be effectuated by the assistance of jigs and shop tools, so that a number of such plates or diaphragms can be very economically fabricated.

To complete each box or section 7 and 9, the cross-plates 14 extend to side plates 18 and 19 of rectangular shape and of sufficient height to reach from the top plate 10 to the bottom plate 11. Where two sections are adjacent, it is necessary to have but one side plate 19 between them, and, if desired, the side plates can be arranged to extend in length past the end or ends of the section to overlie the next section so as to stagger the vertical joints in related sections. While the angles 16 and 17 are preferably field bolted to the external plates 18, they are perforated as are the internal plates 19, so that through-bolts 21 can be used to secure adjacent angles, side plates and sections together.

The top, bottom and cross plates, as well as the side plates, a large number of which are utilized in the dredge hull of my invention, can very easily be nested and stacked to occupy shipping space compactly, so that substantially all of the shipping volume is economically utilized. In field erection, the cross-plates 14 can readily be set up in position with respect to the top and bottom plates 10 and 11 and with respect to the side plates 18 and 19, so that, by effectuating the indicated field welding and utilizing a plurality of removable fasteners 21, such as nuts and bolts together with an appropriate caulking where indicated, a plurality of sections 7 and 9 can be not only assembled but joined together into a complete hull.

The entire hull 6 is therefore constituted of a plurality of sections 7 and 9 each of which in essence is fabricated of a plurality of top, bottom, cross and side plates arranged in box formation, with some having angle irons welded thereto with removable fastenings securing the angle irons, side plates and adjacent sections together.

In addition, each of the sections is preferably provided with interior bracing, conveniently constituted of channel irons 23 which are secured to the top and bottom plates 10 and 11 and are reinforced by gusset plates 24 joining such channels with intermediate angle irons 26 welded to the cross-plates 14. Further reinforcement is provided by cross-angles 27 and 28 extending to the gusset plates 24 and riveted or bolted thereto. Thus, the sections 7 and 9 not only are generally braced by the cross-plates 14 having angle irons welded to the vertical edges thereof, but also have supplementary bracing by reason of the angles 26, 27 and 28 welded and otherwise fastened to the cross-plates. All of the parts utilized in the construction of the sections and in joining the sections together to form the hull are parts which pack very compactly for shipment, which can be readily fabricated in a central plant, and which are designed especially for field erection by unskilled or semi-skilled labor, a number of laborers being able to work on the plates in all of the sections 7 and 9 simultaneously, if desired, to facilitate quick erection of the hull.

Finally, when the hull is substantially erected it is further reinforced and braced by a plurality of plates 32 and 33 which extend longitudinally of the hull preferably above the junctions of various of the sections 7 and 9. The plates 32 and 33 are of adequate thickness to impart extra strength to the assembled plates in tension, but are shown of exaggerated thickness in the drawings, especially in Fig. 2. Similarly shown are butt straps 35 overlying the junctions of adjacent sections. These parts likewise pack well for shipment and are of a character to be prefabricated at a central plant and to be readily assembled with the remaining sections of the hull by unskilled labor.

The dredge hull constituted in accordance with the present invention, consequently, is centrally prefabricated of a number of substantially similar parts which are finished, as far as skilled workmanship is concerned, at the time they leave the central plant, but which are of such a nature as to be very compactly shipped to a point for erection and a number of them can be simultaneously erected by unskilled or only slightly skilled labor utilizing the very simplest fastenings and tools to furnish a completely erected dredge hull of approved and substantial character.

I claim:

1. A dredge hull comprising a plurality of elongated sections joined together, each of said sections including a plurality of structural members, and each of said sections including a vertical, transverse plate, angle irons welded to opposite sides of said plate along the vertical edges thereof, and means for removably securing said angle irons directly to said structural members.

2. A dredge hull comprising a plurality of sections, each section having top, bottom and side structural plates arranged to form sides of an elongated box, a cross-plate extending transversely of said structural plates within said box, angle irons welded to said cross-plate adjacent the edges thereof, and removable means for securing said angle irons directly to said structural members.

3. A dredge hull comprising a short center row and two long side rows of individual sections joined together to provide in plan a generally rectangular hull having a central re-entrant portion in the bow thereof, said center row and side rows of sections being arranged to have their meeting joints in two longitudinal vertical planes, and a plurality of longitudinally extending deck plates each overlying several of said joints and secured to adjacent ones of said sections.

WALTER B. MACAULAY.