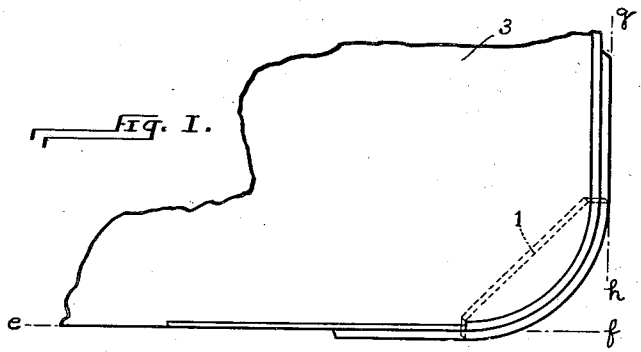
Sept. 15, 1936. A. J. DAWSON 2,054,410

BARGE STRUCTURE

Filed Dec. 10, 1935

Fig. I.



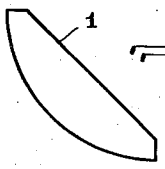


Fig. V.

Fig. II.

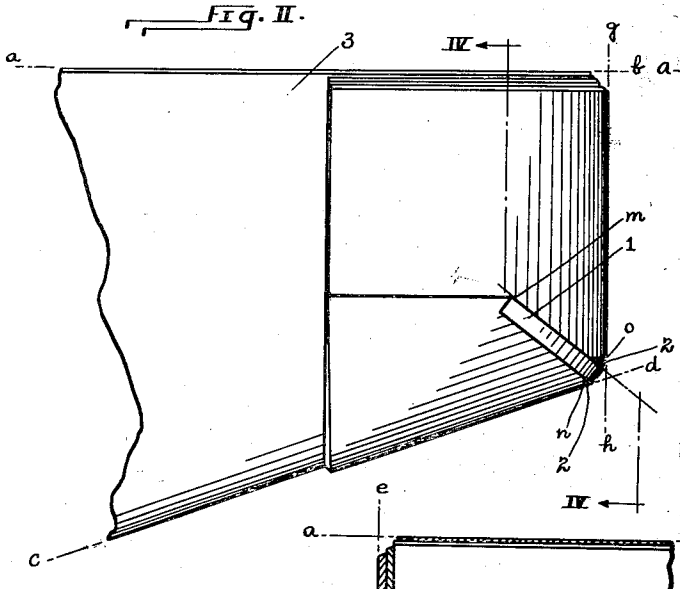
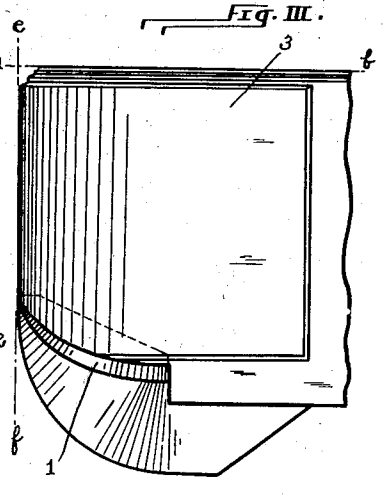


Fig. III.



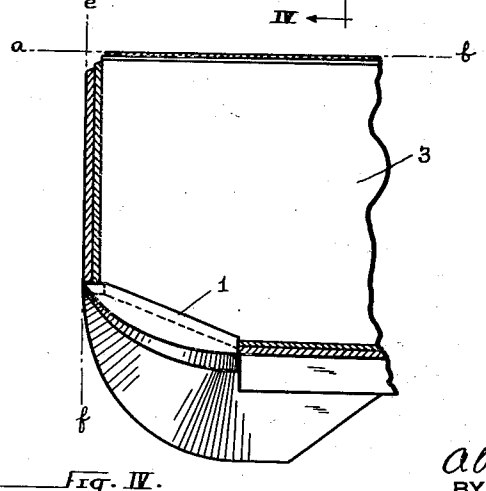


Fig. IV.

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UNITED STATES PATENT OFFICE

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BARGE STRUCTURE

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Application December 10, 1935, Serial No. 53,777

2 Claims. (Cl. 114—79)

This invention relates to the forming of barges and such like structures out of sheet steel, and consists specifically of a corner structure that may be effected in simple manner and cheaply, and that is at the same time strengthened to endure the shocks and impacts of service.

In the accompanying drawing Fig. I is a fragmentary view, showing in plan the corner of a barge in the structure of which the invention is embodied; Fig. II is a view of the same portion of the same barge in side elevation; and Fig. III is a view in front elevation. Fig. IV is a view in section, on the broken plane of section indicated at IV—IV, Fig. II; Fig. V is a view in plan of a certain re-enforcing member detached.

The drawing shows, fragmentarily, a barge, 3, built of plates of steel; such a barge as is commonly used on inland water-ways for the transportion in bulk of such material as coal. The barge is shown with sufficient fullness to indicate that it is substantially rectangular in plan, and substantially rectangular in cross-section; that throughout the greater portion of its length it is flat bottomed; and that the bow and stern are of truncated wedge shape. The gunwale and the decked-over ends extend substantially in a plane *a—b*; the bottom rises at the bow and stern in oblique planes, *c—d*; the sides extend throughout in the vertical planes *e—f*; while at bow and stern the body of the barge terminates in vertical planes of truncation, *g—h*. The three planes last defined meet in a tetrahedral angle.

It is undesirable in such a structure that the corners be sharp. Accordingly, the vertical side wall *e—f* and the vertical end wall *g—h* merge in the quadrant of a cylindrical shell, as shown in plan in Fig. I and in elevation in Figs. II and III. Similarly the vertical side wall *e—f* and the obliquely rising bottom wall *c—d* merge in the quadrant of a cylindrical shell that is shown in side elevation in Fig. II and in front elevation in Figs. III and IV. The vertical end wall *g—h* and the obliquely rising bottom wall *c—d* merge in an arc of a cylindrical shell (of smaller radius and of less than quadrant extent), as is sufficiently indicated in Fig. II.

Considering, first, the two cylindrical shells that form the vertically extending and the obliquely rising corners, it is manifest that they would intersect one another in an edge that in its outline would be a quadrant of an ellipse, lying in an obliquely disposed plane. Such a sharp edge, however, could not be tolerated, and must be rounded away.

The angle of meeting of the three planes (of the vertical side wall, the vertical end wall, and the obliquely rising bottom wall) is a three-dimensional angle, a tetrahedral angle. Not only the two quadrants of cylindrical shells, but the third rounded edge (in which the end wall and the bottom wall meet, here come together. The rounding of the obtuse angle (the angles previously considered are right angles) of meeting of the vertical end wall and the rising bottom wall is continued; the sharp edge in which the two cylindrical quadrants theoretically meet is cut away; but the cut is of diminishing depth throughout the extent of the elliptical quadrant, until the cut merges in and is lost at the surface of the vertical side wall of the barge, at the point *m*, Fig. II. This truncating of the edge of union of the two cylindrical quadrants leaves a gaping space to be filled, of maximum width, *n—o*, at one end of the elliptical line, and of a width diminishing to zero at the other end. This gaping space is with difficulty bridged by a welded-in deposit of fused metal.

The invention consists in cutting away the cylindrical shells to form a slot of uniform width, and of a width approximating the maximum width of the gaping space described, and extending in a plane coincident with the line of meeting of the end and bottom walls and extending from such line obliquely upward and in coincidence with the elliptical line of meeting described; inserting in such slot a plate 1 of steel; and welding the plate in place, as is indicated at 2. The plane of the slot coincides with one edge of the tetrahedral angle and intersects the plane of the opposite face.

Practically, the radii of curvature of the two cylindrical quadrants are equal, and their value, typically, is one foot; the angle that the rising bottom wall forms with the horizontal is approximately 30°; and the radius of curvature of the rounded edge of meeting of end wall and bottom wall is approximately four inches. Given such dimensions, it suffices that the slot be of sufficient width snugly to receive a plate cut from a two-and-one-quarter-inch steel slab.

A weld union is readily effected between the walls of the barge and the inserted plate, throughout all the extent of the cut.

It will be perceived that, not only is building simplified, in that the spaces to be filled by metal fused and welded in situ are diminished in width; but the finished structure is reenforced and strengthened at the very point where in service it is exposed to the impact of collision.

Manifestly the invention is applicable where

plates to be united meet in a tetrahedral angle, and is not limited to a structure in which one of the component plates extends in vertical plane, or meets another at a right angle.

I claim as my invention:

1. A barge or like structure formed of metal plates and having an end portion of truncated wedge shape, including side and end walls and an obliquely rising bottom wall, the corners of meeting between end and bottom walls, between side and bottom walls, and between end and side walls, being rounded, and a reenforcing plate, extending in an oblique plane coincident with the line of meeting of the curved surfaces to which the corners of meeting between side and bottom walls and side and end walls are rounded, such reinforcing plate being united with the wall-forming plates of the structure.

2. A barge or like structure formed of metal plates and having an end portion of truncated wedge shape, including side and end walls and an obliquely rising bottom wall, the constituent plates being slotted at the angle of meeting of the three said walls, the slot extending in a plane coincident with the line of meeting of end and bottom walls and thence obliquely upward, the said slot extending through the side wall of the barge, and a plate introduced into and filling such slot and united to the wall-forming plates throughout all the extent of such slot.

ALBERT J. DAWSON.