

Sept. 15, 1931.

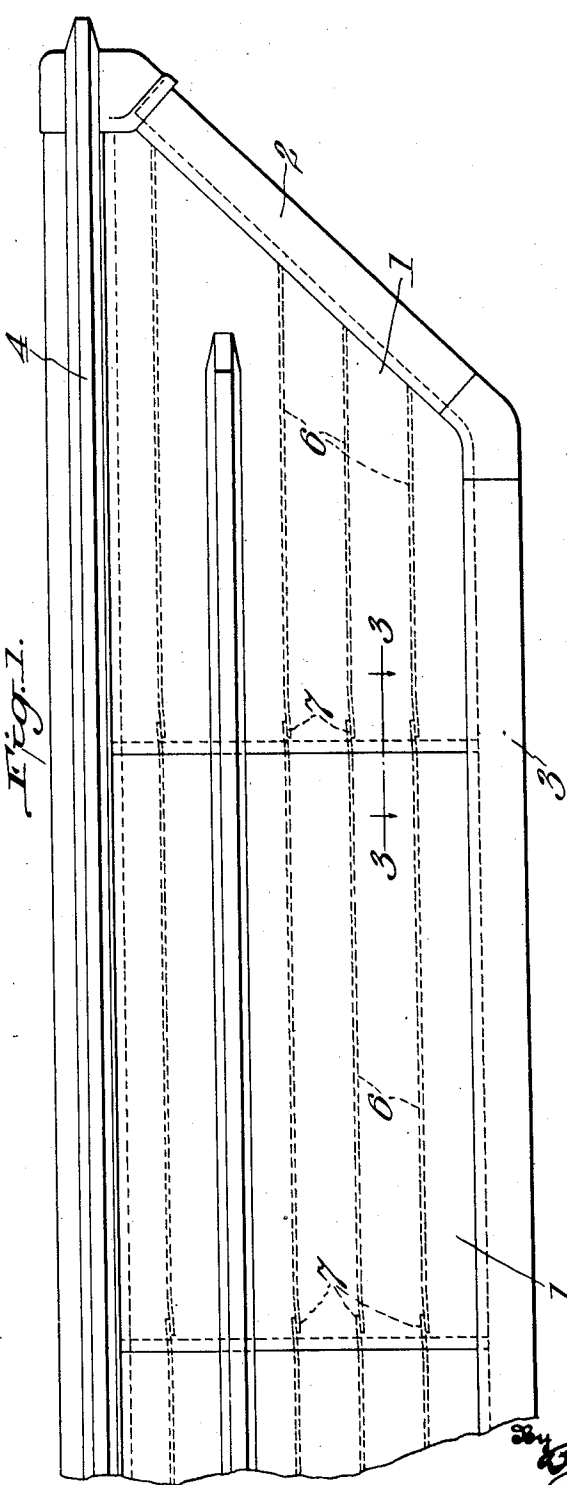
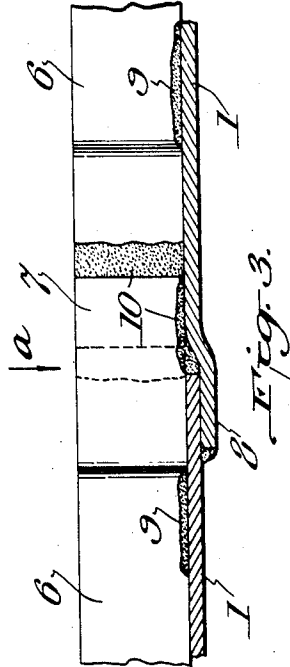
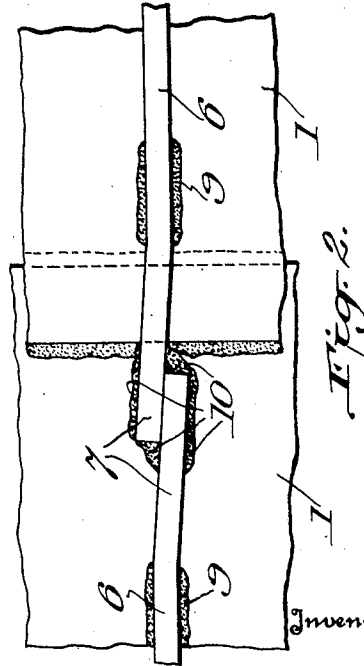
H. F. NORTON ET AL

1,823,699

STRUCTURAL STEEL ASSEMBLY AND METHOD OF PRODUCING SAME

Filed March 28, 1929

2 Sheets-Sheet 1



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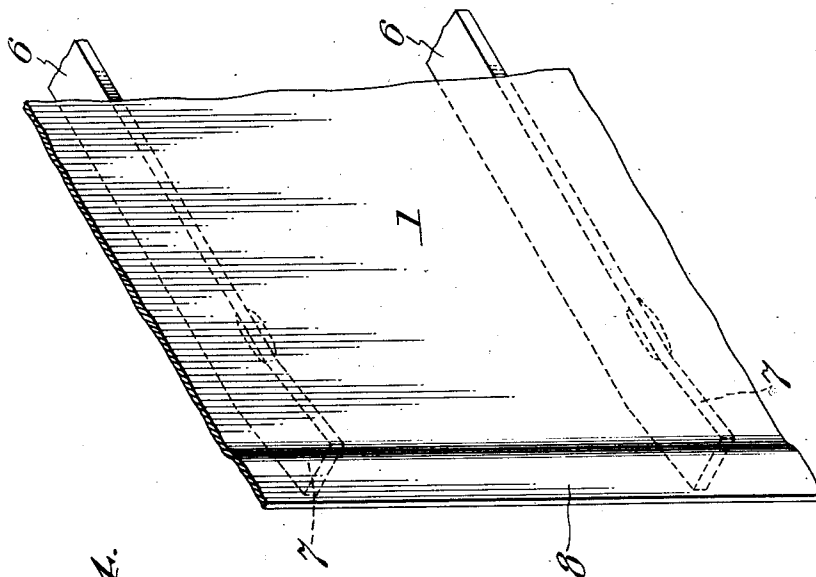
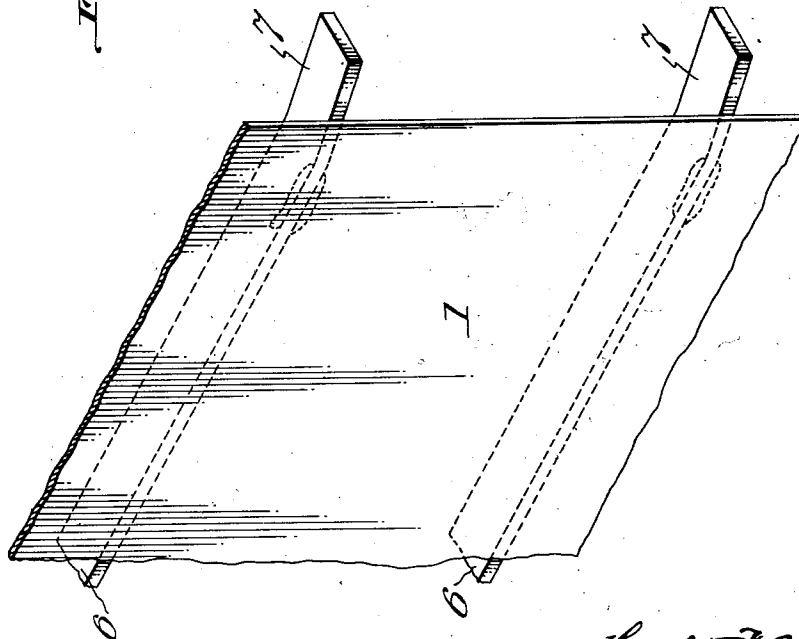


Fig. 4.



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UNITED STATES PATENT OFFICE

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STRUCTURAL STEEL ASSEMBLY AND METHOD OF PRODUCING SAME

Application filed March 28, 1929. Serial No. 350,764.

This invention relates to a structural steel assembly and more particularly to a method of securing together metal plates having stiffener bars thereon.

5 In the construction of metallic structures, such as metal ships and barges, tanks, platforms, buildings, or other structures, it is necessary that the side, or top, or bottom plates be rigid to withstand heavy loads and yet be as light in weight as possible. It has
10 been common practice therefore to use stiffener bars secured to the plates to give necessary rigidity to the plates. These stiffener bars in the past have been secured to
15 the plates after the plates have been assembled in comparatively large assemblies on the ground, or after they have been secured to the framework. It is a difficult task to secure stiffener bars to the plates within the
20 confines of the metal structure due to the framework thereof and other obvious difficulties, and it is difficult to handle large assemblies from the ground.

It is an object of this invention to provide
25 a structural steel assembly of metallic facing members or plates having stiffener members secured thereto for structures of the above indicated character whereby the stiffener bars may more readily be secured to the plates
30 prior to their assembly, thus greatly facilitating the work, and enabling it to be handled in assemblies of any desired size, even to the extent of a single plate with its stiffeners.

It is a further object of this invention to
35 provide a method of assembling and securing plates having stiffener bars previously secured thereto, the bars being free at their ends and the ends on adjacent plates overlapped and drawn into engagement and welded.

It is a further object of this invention to
40 provide in a structural steel assembly of plates to be welded together, and having stiffener bars previously welded thereto, the means of adjustment of the stiffeners into line
45 that is possible in a riveted structure by the

fact that the rivet holes are slightly larger than the rivets.

These and further objects will be apparent from the following description when taken in connection with the accompanying drawings, 50 wherein,

Fig. 1 is a partial side elevation of a barge having the side plates thereof secured according to this invention,

Fig. 2 is a sectional view through the joint 55 of two adjacent plates, looking in the direction of arrow *a*, Fig. 3,

Fig. 3 is a section on line 3—3 of Fig. 1, and Fig. 4 shows a broken view of two plates prior to their assembly. 60

Referring to the drawings, the facing members or plates 1, as shown in Fig. 1, are assembled to form the siding of a metal barge. Suitable strakes 2 and 3 are provided at the front and bottom and bilge plates 4 at the top. 65 The facing members or plates 1 have horizontal braces or stiffener bars 6 thereon, the ends 7 thereof being overlapped, and the plates 1 being overlapped.

The plates 1 are first cut to the proper size 70 and shape on the skids prior to their assembly. One edge of each plate is then offset as shown at 8 to overlap the adjacent plate when assembled. The stiffener bars 6, which in the illustration are shown as $\frac{3}{4}$ " by $3\frac{1}{2}$ " flat 75 bars, are laid on edge on the plates 1 and secured thereto by welding as at 9. These bars extend beyond one edge of the plate and terminate short of the opposite end thereof. Each end of each stiffener bar 6 is left free 80 of its plate, that is, is not welded to the plate. In the example shown, a section about 6 inches long at each end of the bars is left free but it will be obvious that these free ends may be longer or shorter as desired. It will also 85 be obvious that the particular sizes and shapes of stiffener bars used are immaterial.

The stiffener bars 6 are secured to the plates such that the bars will preferably be in approximate alignment when the plates are as- 90

sembled. The free ends 7 of the bars are then bent in opposite directions so that these bent ends will overlap when the plates are assembled. It is obvious that the bars on one plate
 5 may if desired be aligned with those on the next so as to overlap without bending the ends.

The facing members or plates 1 with stiffener bars 6 thus secured thereto are assembled in position with the offset edge of one plate lapping over the edge of the adjacent plate and the stiffener bars 6 overlapped. It is obvious that the plates 1 may be merely brought together in a butt joint, and the ends
 15 of the stiffeners 6 also brought together in a butt joint, but the welded lap joint is more easily assembled and is preferred. The free ends of bars 6 are then drawn into contacting engagement with one another, being either
 20 permanently bent or merely held in engagement by suitable clamps. The overlapped plates are then securely welded together and the ends 7 of the stiffener bars 6 are welded together as at 10 and to the adjacent plates.

25 The joint thus formed is exceedingly rigid and strong and the assembly is greatly facilitated.

It will be obvious that this type of joint may be used with a vertical or horizontal
 30 seam, the stiffener bars being arranged accordingly, and that it may be and is intended to be used also for the deck plating and bottom plating of a barge. It will also be clear that the joint is not limited to a metal barge
 35 but may be useful in many other metal structures.

The invention is not limited to the detailed structure as shown except in so far as indicated in the accompanying claims.

40 We claim:

1. The method of securing structural plates together at their meeting edges which comprises securing to each plate a stiffener bar, the ends of the stiffener bars adjacent
 45 the meeting edges of the plates being left free, assembling the plates with the stiffener bars overlapping, bending the free ends of the stiffener bars into contacting engagement, and welding the overlapped stiffener
 50 bars together.

2. The method of securing structural plates together at their meeting edges which comprises securing to each plate a stiffener bar, the ends of the stiffener bars adjacent
 55 the meeting edges of the plates being left free, assembling the plates with the stiffener bars overlapping, bending the free ends of the stiffener bars into contacting engagement, and welding the overlapped ends of
 60 said bars together and to the assembled plates.

3. The method of securing structural plates together at their meeting edges which comprises welding to each plate a stiffener
 65 bar, the ends of the stiffener bars adjacent

the meeting edges of the plates being left free, off-setting the meeting edge of one plate, assembling the plates with the off-set edge of one plate lapped on the edge of the adjacent plate and with the stiffener bars
 70 overlapped, drawing the free ends of the stiffener bars in contacting engagement, and welding the overlapped stiffener bars together and the overlapped plates together.

4. The method of securing structural
 75 plates together at their meeting edges which comprises welding a stiffener bar to each plate, the ends of the stiffener bars adjacent the meeting edges of the plates being left
 80 free, the stiffener bars extending beyond the meeting edge of one plate and terminating short of the meeting edge of the other plate, assembling the plates with the stiffener bars
 85 overlapping and the plates overlapping, drawing the overlapped ends of the stiffener bars together, and welding the overlapped stiffener bars together and to the adjacent plate.

5. The method of securing structural plates upon the framework of a metal barge
 90 or ship which comprises welding to each plate a stiffener bar, the ends of the stiffener bar adjacent the edges of the plates being left free, said bars projecting beyond the
 95 edge of one end of each plate and terminating short of the edge of the other end of each plate, assembling the plates with the edges thereof, overlapped and the stiffener bars
 100 overlapped, drawing the overlapped stiffener bars into contact, and welding the overlapped plates together, the overlapped stiffener bars together, and the free ends of the stiffener bars to the plates.

6. The method of securing structural plates upon the framework of a metal barge
 105 or ship which comprises securing to each plate a stiffener bar while the plates are disassembled and prior to their attachment to the framework, the ends of the stiffener bars adjacent the edges of the plates being left
 110 free, assembling the plates and securing them to the framework with the ends of the stiffener bars on adjacent plates overlapped, drawing the overlapped ends of the stiffener bars together, and welding these overlapped
 115 ends together and to the plates.

7. A structural steel assembly comprising the combination with a plate, of a stiffener bar secured to said plate, the ends of said bar being free and bent in opposite directions
 120 away from the plane of the principal portion of the bar.

8. In a structural steel assembly, the combination with a plate, of stiffener bars each secured along the edge of its principal portion to said plate, the end portions of each
 125 bar being free and inclined to the principal portion of the bar.

9. A structural steel assembly comprising the combination with a plate having an offset
 130

portion at one end, of a stiffener bar secured to said plate with one of its ends extending to said offset portion and the other end extending beyond the end of said plate which
5 lies opposite said offset portion, the end portions of said bar being free and bent away from the principal portion of said bar.

In testimony whereof, we affix our signatures.

10 HAROLD F. NORTON.
JAMES W. OWENS.

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