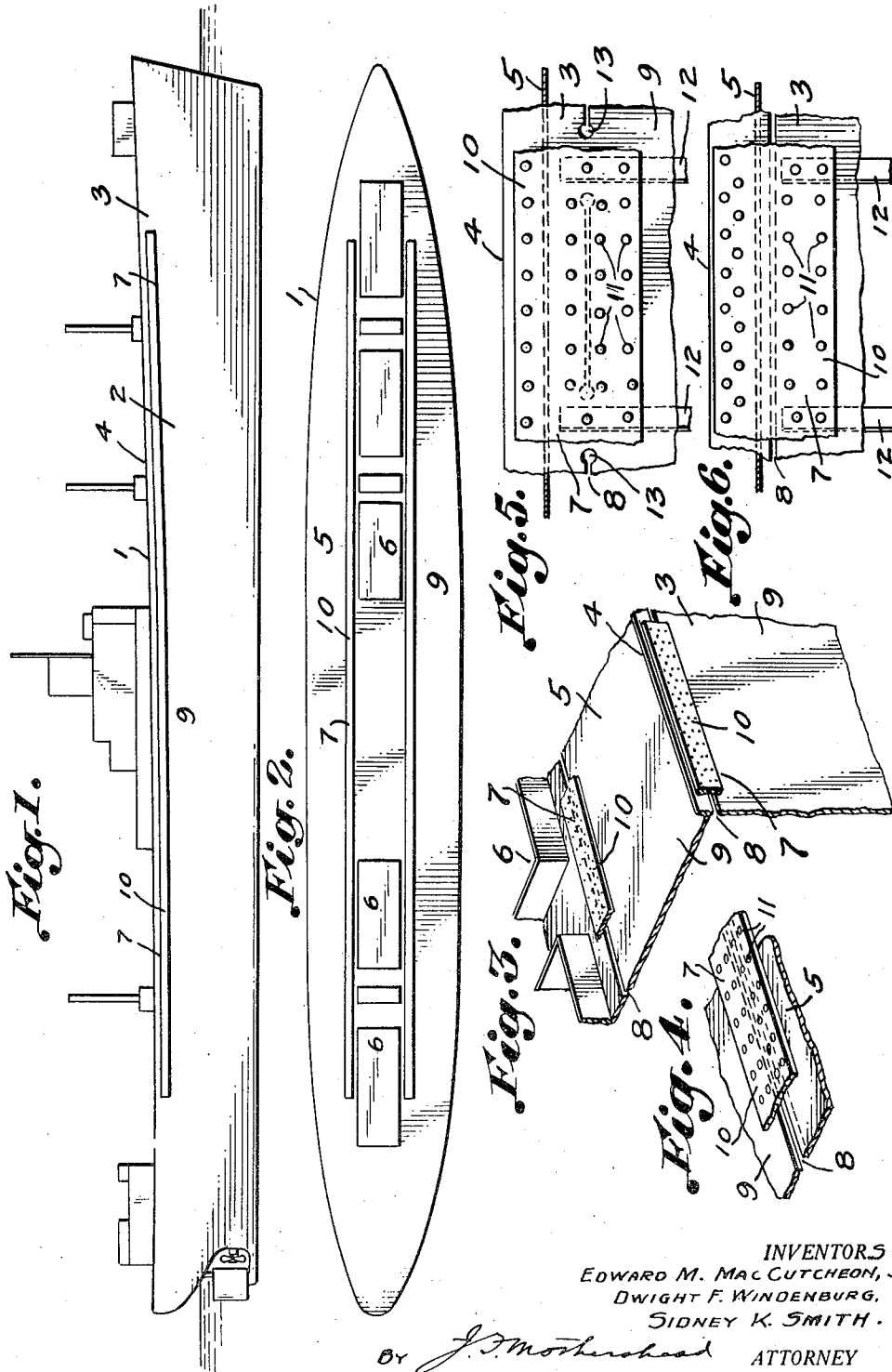


Feb. 8, 1949.

E. M. MacCUTCHEON, JR., ET AL
METHOD AND MEANS FOR ARRESTING THE CRACKING
OF THE PLATES OF WELDED SHIPS
Filed May 3, 1945

2,460,893



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UNITED STATES PATENT OFFICE

2,460,893

METHOD AND MEANS FOR ARRESTING THE
CRACKING OF THE PLATES OF WELDED
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Application May 3, 1945, Serial No. 591,658

9 Claims. (Cl. 114—79)

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This invention relates to steel ships, but more particularly to welded steel ships, and has for its object to provide a method and construction for arresting the cracking of plates of ships which are welded together in accordance with the modern practice of ship building.

The causes which are responsible for the cracking of the plates of welded steel ships are not entirely understood. It is generally agreed that no single cause for the failures exists. Various causes have been suggested, such as hasty welding, lenient inspection, faulty material, untried designs intended to expedite construction, temperature stresses and the residual effects of improper welding sequences. However, it is practically certain that no one of these alone is accountable, and it is a controversial question as to how far any one of them may be present in any given case of failure.

That there may be certain conditions present which are favorable to the starting of cracks in the plates is recognized, such for instance, as the sharp corners of hatches, but for the most part the cracks appear to start from an undetected origin, and in many cases the presence of the cracks is not known and progress so rapidly that the ships actually break in two before any remedial steps can be taken.

With the object in view of arresting the progress of the cracks, rather than the provision of means for preventing their starting, the invention consists in the particular construction and treatment of the decks or top sides of a ship either during its construction, or as a preventive measure after the ship has been constructed, as will be first duly described and afterwards specifically pointed out in the appended claims.

Referring to the accompanying drawing:

Fig. 1 is a sheer plan of a ship showing the preferred location of the crack-arresting device on the sheer strake.

Fig. 2 is a deck plan of a ship showing the preferred locations of the crack-arresting devices on each side of the hatches and superstructure.

Fig. 3 is a perspective view of a fragment of the deck and sheer strake of a ship showing the locations of the crack-arresting devices as illustrated in Figs. 1 and 2.

Fig. 4 is an enlarged fragmentary view of the crack-arresting device on the deck of a ship.

Fig. 5 is an elevation of a fragment of the sheer strake of a ship showing a modification of the crack-arresting device; and

Fig. 6 is an enlarged fragmentary elevation of

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the sheer strake of a ship showing the crack-arresting device as illustrated in Figs. 1 and 3.

Like numerals of reference indicate the same parts throughout the several figures, in which:

1 indicates a welded steel ship having the top sides 2 terminating in the sheer strake 3 at the gunwale 4 where the deck 5 joins the sheer strake 3, as shown in Fig. 3, and 6 indicates the deck hatches, superstructure, etc., as are conventional on all ships.

The plates of the deck and the hull of ships to which this invention relates are welded together, which plates experience has shown are susceptible to cracking. Therefore, in order to arrest any crack, or cracks, before it or they progress to a dangerous extent, we provide longitudinally of the deck 5 and to both sides of the hatches and superstructure 6 a crack-arresting device 7 which extends throughout the greater part of the length of the ship, and likewise an identical crack-arresting device 7 is arranged along the sheer strake adjacent the gunwale 4 on each side of the ship, as shown in the drawings.

Each crack-arresting device consists of a slot 8, torch cut entirely through the welded plating 9, if the arresting devices are applied to ships already completed, but on ships under construction, the slot may be otherwise provided in the plating. Completely covering the slot 8 formed in the plating 9 is a strap 10 which extends a suitable distance on each side of the slot and is suitably riveted to the plating of the ship on both sides of the slot by rivets 11, as shown in the drawings.

Referring to Fig. 5, it will be seen that the arresting device may consist of a series of short slots 8 extending between the frames 12 of the ship. In this case the series of short slots 8 are covered by a continuous strap 10 riveted to the plating 9, as just described. At the ends of the slots 8, in Fig. 5, as well as in the continuous slots 8, in Fig. 3, it is advisable to provide a circular enlargement 13 to prevent the plates from cracking in continuation of the slots beyond their desired terminations.

Having thus described the invention, the crack-arresters 7 function to stop a crack which starts in a plate when the crack reaches the slot formed in the plate before extensive damage results, since the crack will not cross the slot and the reinforcing strap 10 riveted to the plate on both sides of the slot 8.

We do not wish to be understood as limiting ourselves to the exact construction shown and described, as various changes and modifications

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may be made therein and we consider ourselves clearly entitled to all such changes and modifications as fall within the limit and scope of the appended claims.

We claim:

1. The herein described method of arresting cracks in the plates of welded ships which includes the forming of slots longitudinally of the deck and top sides of a ship and in providing a metal strap to cover each longitudinal slot and in riveting the strap to the plates on both sides of the slot.

2. The herein described method of arresting cracks in the plates of welded ships which includes the forming of a slot longitudinally of the deck of a ship, in covering the slot with a metal strap and in riveting the strap to the plates along both sides of the slot.

3. The herein described method of arresting cracks in the plates of welded ships which includes the forming of a slot longitudinally of the top side of a ship, in covering the slot with a metal strap and in riveting the strap to the plates along both sides of the strap.

4. The herein described method of arresting cracks in the plates of welded ships which includes the forming of a slot longitudinally of the top side of a ship adjacent the gunwale on each side thereof, in covering the slots with metal straps and in riveting the straps to the plates along both sides of the slots.

5. A welded steel ship having its deck and top sides provided with a plurality of longitudinal slots extending entirely through the plating of the ship and a metal strap covering each of the

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slots and riveted to the plating along both sides of the slot.

6. A welded steel ship having its deck provided with a longitudinal slot extending entirely through the deck plating, and a metal strap covering the slot and riveted to the deck plating along both sides of the slot.

7. A welded steel ship having its top side provided with a longitudinal slot extending entirely through the top side plating and a metal strap covering the slot and riveted to the plating along both sides of the slot.

8. A welded steel ship having its top sides provided with a longitudinal slot adjacent the gunwale on both sides of the ship, and a metal strap covering each slot and riveted to the plating along both sides of the slot.

9. A welded steel ship having frames and plating, and provided with a series of longitudinal slots in the plating between the frames thereof and a metal strap covering said series of longitudinal slots and riveted to the plating in both sides of the series of slots.

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REFERENCES CITED

The following references are of record in the file of this patent:

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