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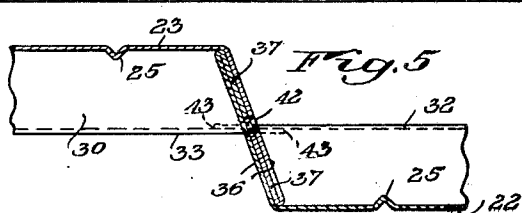
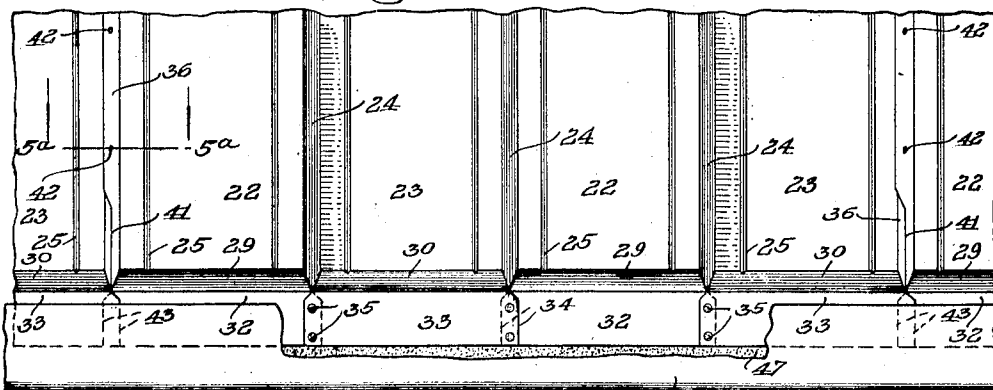
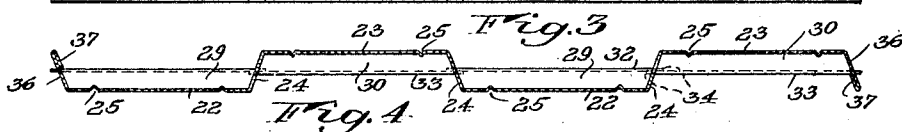
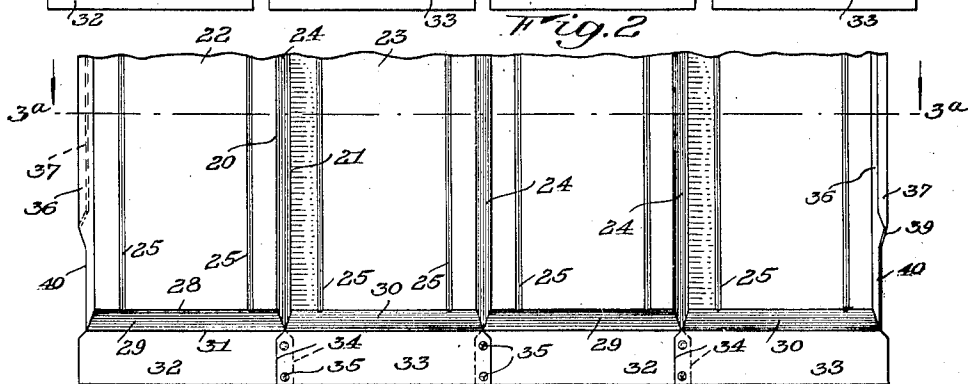
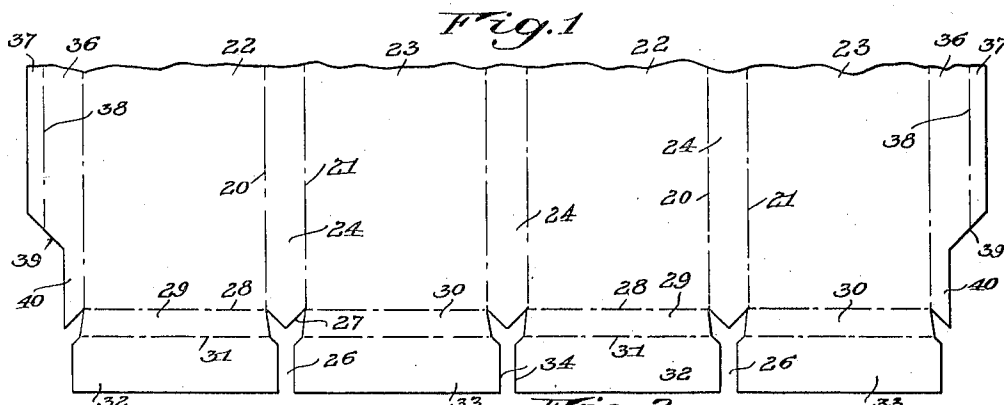
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2,333,289

SHIP JOINER BULKHEAD

Filed April 6, 1943

3 Sheets-Sheet 1



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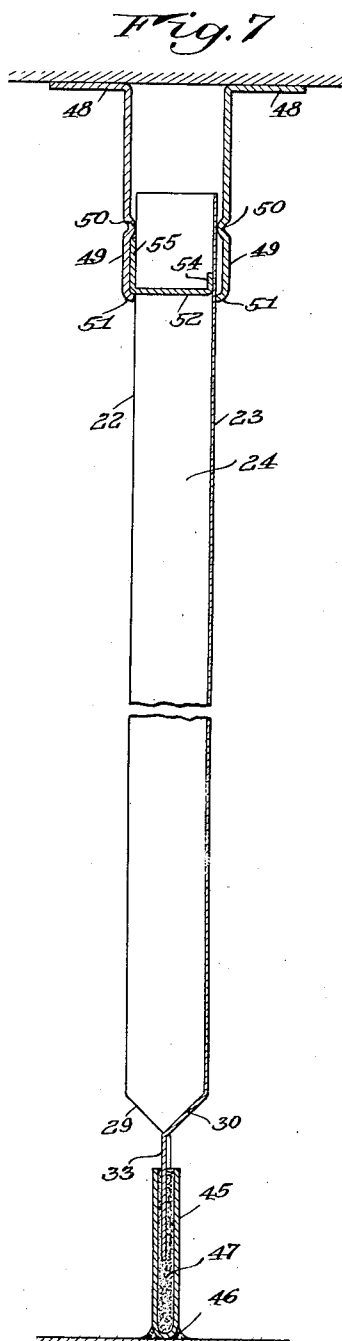
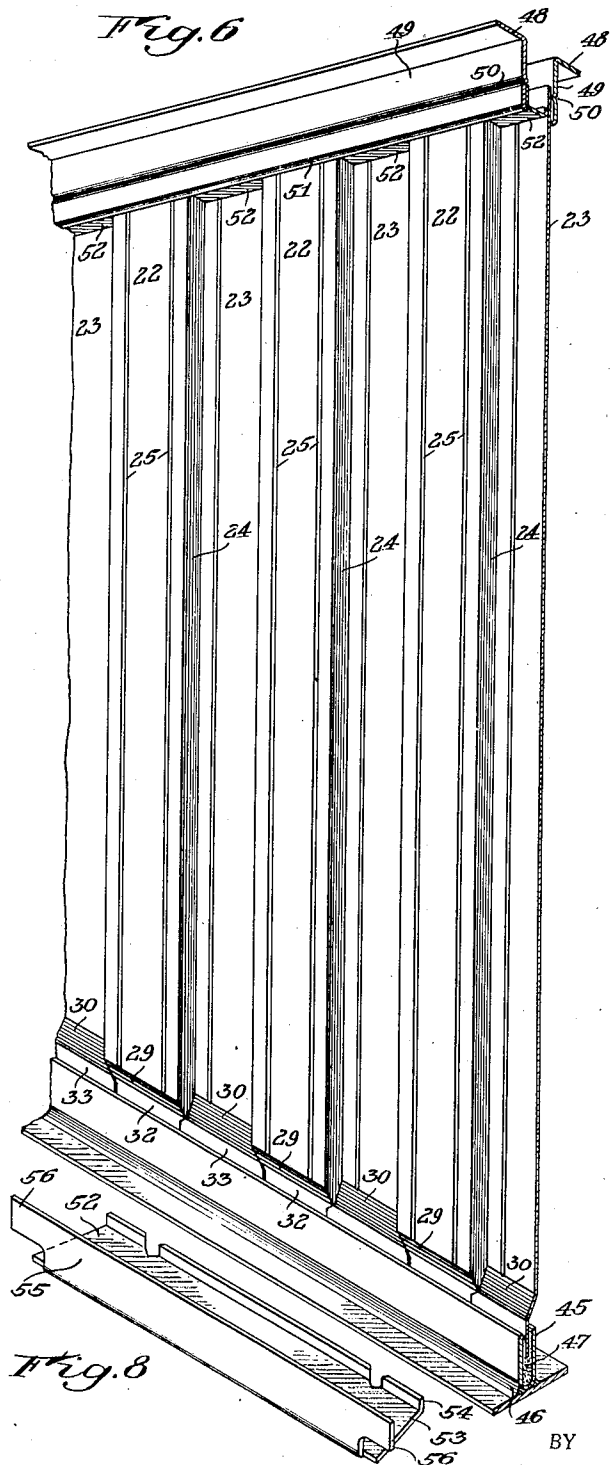
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3 Sheets-Sheet 2



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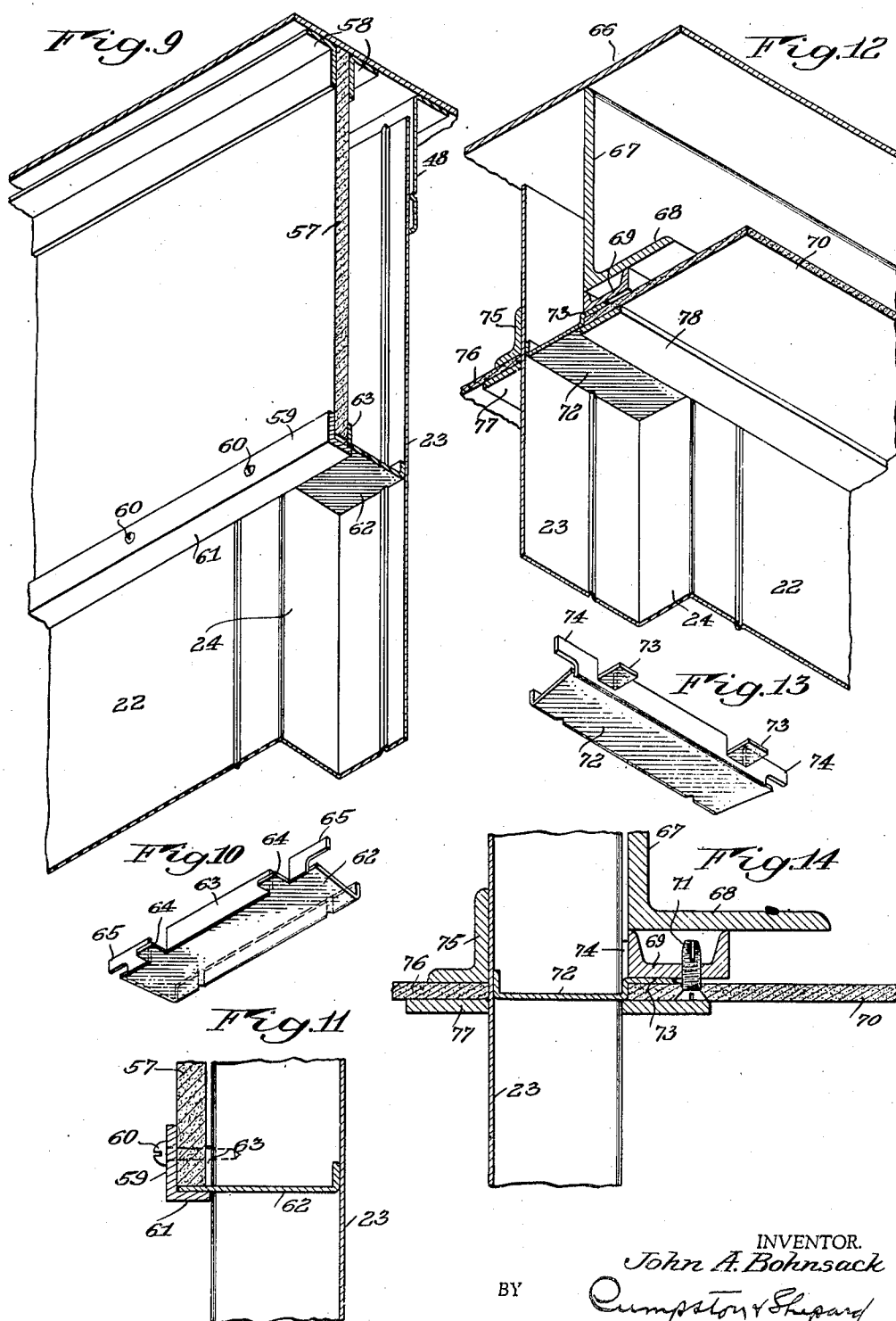
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SHIP JOINER BULKHEAD

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3 Sheets-Sheet 3



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2,333,289

SHIP JOINER BULKHEAD

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Application April 6, 1943, Serial No. 481,987

18 Claims. (Cl. 114—78)

This invention relates to the construction of ship bulkheads and, while applicable to bulkheads of both the joiner work and structural types, it embodies certain features which particularly adapt it to meet the requirements of joiner bulkheads made of panels of light sheet material.

The considerations connected with joiner work bulkheads impose exacting requirements of strength and rigidity combined with a minimum amount of weight consistent with the required strength. Various other problems also are presented, such, for example, as the removal of light weight materials from the moisture and corrosive conditions near the deck surface; the requirement that the bulkhead be free from moisture and dirt-collecting pockets tending to increase corrosion; that the bulkhead form a tightly closed partition, as well as that it have a construction capable of being readily manufactured and installed.

One object of the invention is to provide an improved joiner bulkhead made of panels of sheet material so formed as to afford a high degree of strength combined with a minimum amount of weight consistent with the necessary rigidity.

Another object is the provision of such a bulkhead in a type of construction by which light weight and thin materials capable of being seriously damaged by corrosion, such as thin sheet metal, are removed and protected from the moist and corrosive condition commonly produced near the deck surface by swabbing down, flying salt spray and the like.

Another object is to produce a bulkhead of the above nature having its lower portion so constructed as to be free from moisture and dirt-collecting pockets and capable of being rigidly attached to a deck by a simple and adaptable anchoring means.

Another object is the provision of such a construction having the panels so formed and supported as to afford a partition of tightly closed character.

Another object is to afford such a bulkhead in a construction capable also of being rigidly supported at its top by continuous, horizontal members and of forming a tight closure with the same.

A further object is the production of a construction capable of being manufactured readily and economically and of being easily adapted and installed in spaces of irregular angles and dimensions such as commonly encountered in ship joiner work.

Still a further object is the provision of such a bulkhead having a surface conformation which

is capable of being easily cleaned and refinished and presenting an attractive appearance.

To these and other ends the invention resides in certain improvements and combinations of parts, all as will be hereinafter more fully described, the novel features being pointed out in the claims at the end of the specification.

In the drawings:

Fig. 1 shows the lower portion of a blank cut to shape for forming a panel employed in a preferred embodiment of the invention;

Fig. 2 shows such blank portion formed up into shape;

Fig. 3 is a sectional plan view of the same on the line 3a—3a in Fig. 2;

Fig. 4 is a side elevation showing the lower portion of a series of said panels assembled together with means for attaching the same to a floor deck;

Fig. 5 is an enlarged, sectional plan on the line 5a—5a in Fig. 4, showing the connection of adjacent panels;

Fig. 6 is a perspective view, partly in vertical section, showing the completed bulkhead and means for attaching the same to ceiling and floor decks;

Fig. 7 is an enlarged vertical section of the parts shown in Fig. 6, partly broken away;

Fig. 8 is an enlarged perspective of a filler clip shown in Figs. 6 and 7;

Fig. 9 is a perspective view, partly in vertical section, of the upper portion of a panel showing a modified attachment to a ceiling deck;

Fig. 10 is a perspective view of a filler clip shown in Fig. 9;

Fig. 11 is a fragmentary, enlarged, vertical section showing the clip of Fig. 10 assembled in place;

Fig. 12 is a perspective view, partly in vertical section, of the upper portion of a panel and showing its adaptation in still a different way to a ceiling deck;

Fig. 13 is a perspective view of a filler clip employed in the modification of Fig. 12, and

Fig. 14 is an enlarged, fragmentary, vertical section showing the clip of Fig. 13 assembled in place.

The invention is disclosed in the present instance, by way of illustration, as embodied in a joiner bulkhead comprising a series of sheet metal panels formed with vertical reinforcing flutes or corrugations and securely anchored to floor and ceiling decks, so as to afford a high degree of strength and rigidity and thus provide for the use of sheet metal of minimum weight

consistent with the necessary strength. Referring more particularly to the drawings, Fig. 1 shows the lower portion of a flat blank cut to shape from light sheet metal stock of, say, No. 18 or No. 20 gauge, ready for forming up into one of the panels. The upper portion of the blank which is broken away is a continuation of the same shape to the extent necessary to afford the desired height. The opposite or lower edge of the blank is notched or cut, as shown, for a purpose hereafter described.

A blank so shaped is formed or bent symmetrically about spaced parallel lines, as 20 and 21, to produce a fluted or corrugated formation comprising on each side of the panel, the alternately projecting and recessed portions 22 and 23, respectively. The intermediate connecting portions 24 extend transversely, preferably at slightly more than a right angle to the portions 22 and 23, as shown in Figs. 2 and 3. The panels may be made in any suitable width, the one shown being about 24 inches wide, with the portions 22 and 23 about 6 inches wide and offset about $1\frac{1}{4}$ inches from each other. Such corrugated formation disposes a maximum amount of the material at a maximum distance from an intermediate plane, within a desired depth of offset or thickness of panel, and so produces a panel of maximum strength and rigidity for the weight of metal employed. Its rigidity is preferably further increased by additional shallow vertical flutes or corrugations formed in the face portions 22 and 23, as at 25, in the arrangement shown, which serves also to increase the ornamental appearance of the panel.

While the employment of a corrugated construction, as described, is highly advantageous for obtaining the desired combination of strength and lightness, it entails certain problems in protecting the light and thin material from serious injury by corrosion; in providing a bottom construction free of moisture and dirt-collecting pockets and in connecting the bulkhead to the floor and ceiling decks in such a way as to maintain a tightly closed structure. I have found that this problem may be satisfactorily solved in part by a special formation of the lower portion of the panels, as shown in Figs. 2 and 3. For this purpose, the lower edge of each panel is notched or cut with indentations 26, preferably having the irregular shape shown in Fig. 1. Such indentations lie below the transverse portions 24, each of which is thereby formed at its lower end with the projecting V shape shown at 27. Notches 26 separate the bottom extensions of the face portions 22 and 23 and such extensions are preferably bent oppositely about a line 28 to incline them inwardly and downwardly toward a common plane intermediate the planes of the projecting corrugation portions 22 and 23. The portion 23 is thus formed with a downwardly and rearwardly inclined section 29, while the portion 22 is formed with a similar section 30, inclined downwardly and forwardly, these sections 29 and 30 having edges thus brought to abut the edges of the V shaped projection 27 of the transverse portion 24. The oppositely inclined sections 29 and 30 are thus brought to intersect each other at the point of the projection 27, as shown, below which the sections 29 and 30 are bent vertically downwardly about line 31 so as to form the vertical bottom extensions 32 and 33, respectively.

The lower ends of notches 26 are somewhat

narrowed with the result that as the panel corrugations are formed, the ends of adjoining extensions 32 and 33 are brought into overlapping relation as shown at 34 and the overlapping ends are secured together, preferably by spot welding, as at 35. It will be understood that the bottoms of the portions 22 and 23 are preferably first bent about the lines 28 and 31, as described, and the corrugations subsequently formed to overlap the extensions 32 and 33, the extension 32 preferably crossing and being located on the rear side of extension 33, to interlock and more strongly form the parts.

The panels are thus provided with a common, vertical, substantially plane and continuous bottom flange, which is preferably located intermediate the planes of the oppositely projecting corrugation portions 22 and 23 and also preferably in a median plane symmetrically located between the two sets of projections. This bottom flange provides an advantageous means for supporting the bulkhead at its bottom, as hereafter described.

The bottom construction of the panel described above produces a substantially tight partition closure and to increase its tightness the downwardly inclined portions 29 and 30 are sealed to the downwardly projecting lower end 27 of the transverse corrugation portion 24, preferably by gas welding, so as to join the meeting edges of such parts together to preserve a continuously tight closure.

For the purpose of connecting the adjacent panels together, each panel is preferably terminated at each side edge with a transverse corrugation portion 36, the outer edge 37 of which is bent back reversely upon itself about a line 38. The portion 36 is preferably cut away, as at 39, to reduce the width of its lower end by nearly half, as at 40. This edge portion 36 of one panel is arranged to overlap and embrace the oppositely projecting edge portion of the next panel, as shown in Fig. 5, with the edges of the reduced lower ends 40 slightly overlapping each other midway of the combined transverse portion, as at 41, Fig. 4, so as to provide a closed joint between adjacent panels. The overlapping portions 36 are secured together, as by riveting, as indicated at 42, Fig. 5, and the extensions 32 and 33 of adjacent panels are also arranged to overlap each other, as at 43, Fig. 4, to additionally connect the panels and maintain the continuity of the bottom flange of the bulkhead.

As a further part of the means for rigidly supporting and tightly closing and protecting the bottom of the bulkhead, it is provided with a combing for receiving the bottom flange and attaching it to a floor deck. Such combing is preferably in the form of a deep, narrow, U-shaped shoe or channel 45, Figs. 4, 6 and 7, made of metal of substantial thickness and rigidity. The combing 45 is welded to the deck, as at 46, with its flanges projecting upwardly and embracing the bottom flange of the bulkhead with a small clearance therebetween, as shown, and it has a depth which is greater than the depth of the bulkhead flange, so that while the combing follows the contour of the sheer and camber of the deck, it embraces the bottom flange of the bulkhead with a variable amount of overlap, thus facilitating the adjustment of the spacing of the bottom flange relative to the deck. To fix and seal the bulkhead flange in the combing and close the latter against the entrance of moisture, the

restricted space within the combing channel about the flange is filled with a moldable, water-proof material 47, such as mastic.

In the event that it becomes necessary to remove one of the panels, the rivets 42 connecting it with adjacent panels are removed, its top fastenings (hereafter described) are loosened, its bottom flanges freed from the mastic filling of the combing and the panel may then be easily lifted, as permitted by the cut-away portions 40, so as to free the bottom flange from the combing and permit the panel to be swung laterally and removed from the bulkhead.

As is well known, the bottom portion of a ship bulkhead adjacent the deck is frequently wet from swabbing down, spray, leakage, and the like, with the result that it is particularly subjected to corrosive attack. It will be seen that the above described construction serves to protect the thin metal parts of the bulkhead by elevating them substantially above the moisture region of the deck surface and by providing them with a conformation, of downwardly inclined, smooth surfaces, which are free from moisture and dirt-collecting pockets. This principle of construction is further carried out by the enclosure and sealing of the bottom flange in the combing 45, so that the structure as a whole is well protected from injury by corrosion and is adapted to be easily cleaned and refinished from time to time in the course of ordinary upkeep.

To further maintain the tightness of the closure, notwithstanding the corrugated formation of the panels, the invention provides also a simple, adaptable and practical means for effectively closing the bulkhead at its top support. One adaptation of such means, in connection with a simple form of attachment to a ceiling deck, is shown in Figs. 6 and 7, in which the ceiling deck supports a pair of continuous, horizontal members 48, of generally angular shape, each having a depending flange 49 extending into engagement with the projecting portions of the opposite sides of the bulkhead, so as to firmly support the same in position, the flanges 49 being sufficiently deep to compensate for variation in the spacing between the bulkhead and the deck, as the dimensions and angles of the space may vary. The angle flanges are preferably indented, inwardly of their edges, to form inwardly extending ridges 50 and are formed with inturned margins 51, thus affording spaced lines of contact with the bulkhead, so as to maintain a slight separation of the body of the flanges 49 from the corrugations. In this arrangement, however, the recessed corrugation portions, as 33, on each side of the bulkhead, leave open spaces which interrupt the tightness of the bulkhead and are also unsightly. It has been found that this difficulty may be overcome by providing metal filler clips for closing such openings and that such clips may be so constructed as to be readily inserted and supported in place by the horizontal members.

In connection with a ceiling deck attachment such as shown in Figs. 6 and 7, the clip, as 52, Fig. 8, preferably comprises a horizontal plate or body portion 53, with upturned flanges 54 and 55 on opposite sides thereof. Flange 54 is a narrow one for engagement with the recessed portion of the panel, while flange 55 is of greater width and provided with projecting, vertical end wings 56 adapted to be inserted at opposite sides of the panel recess between the corrugation pro-

jections 22 and the body of the supporting flange 49, as shown in Fig. 7. By means of such wings and the inwardly bent bottom edge 51 of the angle flange 49, the clips are accurately and securely held in position to effectively close the openings otherwise produced by the corrugations of the bulkhead.

A somewhat different type of ceiling deck attachment is shown in Figs. 9 to 11, inclusive, where the deck carries an angle member 40, such as previously described, for engagement with one side of the bulkhead. The latter is supported on its opposite side, however, by a flush panel 57, of marine sheathing or the like, fixed at its top, as by means of angle strips 58 to the deck and extending downwardly some distance over the corrugated structure. Panel 57 carries at its lower outer edge an angle member 59 secured thereto and to the panel as by means of sheet metal screws 60 and having its lower horizontal flange 61 slightly spaced from the bottom edge of panel 57. A somewhat modified filler clip 62, Fig. 10, has struck from its flange 63, a pair of wings 64 lying in the horizontal plane of the body of the clip. These horizontal wings are inserted between the bottom of the panel 57 and its angle flange 61, while vertical wings 65 of the clip, such as previously described, are inserted between the panel 57 and the projecting portions of the corrugated bulkhead, thereby securely anchoring the clip in position and closing the corrugation recess in the bulkhead, as previously described.

Figs. 12 to 14, inclusive, show the adaptation to a further type of top support comprising a ceiling deck 66 above a structural angle member 67 having a horizontal flange 68. Secured below the flange is a channel 69 for supporting the bulkhead. In this construction, a false ceiling panel 70, of marine sheathing or the like, is attached by means of "shake-proof" screws 71 to the channel 69 in slightly spaced relation as shown. The bulkhead is attached by screws or other suitable means to the vertical flange of the angle 67 in slightly spaced relation and a filler clip 72 is retained as before by wing extensions inserted between the bulkhead and the supporting parts. The clip 72 is constructed as described above in connection with the other modifications, except that its horizontal wings 73, Fig. 13, are spaced above its horizontal body portion, and inserted between the channel 69 and the ceiling panel 70, as shown. Its vertical wings 74 are inserted between channel 69 and the projecting corrugations and the clip is thus securely anchored in position so as to close the openings created by the corrugations. The opposite side of the bulkhead has attached thereto an angle member 75 carrying a false ceiling panel 76, as shown. Finishing strips 77 and 78, of a type commonly employed to cover the joints of sheathing panels, may be applied to the panels 70 and 76 to more tightly close the joint with the bulkhead and improve the appearance. The filler clips are readily secured in position by merely loosening the bulkhead screws, as 69 and 71, inserting the clip wings between the parts and tightening the screws to clamp the clip wings in place. The edge of the clip which abuts the panel surface 23 is preferably notched, as shown, to accommodate the reinforcing ridges 25 of the panel and maintain a tight joint.

The described construction comprises an exceptionally rigid panel formation which permits of the use of panels of minimum weight. The

portions adjacent the deck are so constructed and arranged as to elevate the thin panel material well above the moist and corrosive conditions commonly prevailing adjacent the deck surface. Still further protection is afforded by the inclination of the lower ends of the panel corrugations downwardly and inwardly to form the vertical bottom flange sealed into the deck combing, to thereby eliminate depressions capable of collecting moisture and dirt. The bulkhead is supported at top and bottom by means which are readily adaptable to the variations in structural dimensions and angles commonly encountered in ship joiner work, while maintaining a tight closure between the corrugated formation of the panels and the supporting elements. The various parts are so designed as to be readily and economically manufactured and installed and easily cleaned and refinished, in normal upkeep, and the design embodies symmetrical and harmonious lines and proportions which present an ornamental and attractive appearance.

While the panels of the bulkhead have been described in connection with a preferred embodiment as composed of sheet metal, it is contemplated that they may be formed of known or suitable non-metallic materials, or combinations of metallic and non-metallic materials, capable of being formed as described, and while the present embodiment comprises features particularly adapted for bulkheads of the relatively light type of construction commonly classed as ship joiner work, the invention is applicable also to bulkheads of the heavier or structural type.

It will thus be seen that the invention accomplishes its purposes and while it has been herein disclosed in preferred embodiments, it is to be understood that such disclosure is intended as illustrative, rather than by way of limitation, as it is contemplated that various other modifications in the construction and arrangement of parts will occur to those skilled in the art within the spirit of the invention and the scope of the appended claims.

I claim:

1. A ship bulkhead construction comprising a series of panels of sheet material each formed with vertical, reinforcing corrugations, the projecting corrugation portions on opposite sides of each panel being formed to extend into a common, vertical bottom flange, a substantially channel-shaped combing arranged for attachment to a deck with the spaced flanges thereof embracing said panel flange, and a sealing material filling said combing about said panel flange to exclude moisture therefrom.

2. A ship bulkhead construction comprising a series of panels of sheet material each formed with vertical, reinforcing corrugations including face portions offset alternately in opposite directions substantially symmetrically with reference to a median, longitudinal plane and forming the opposite side faces of the panel, said offset face portions being formed to extend into a substantially common and continuous, vertical bottom flange, a substantially channel-shaped combing arranged for attachment to a deck with the spaced flanges thereof embracing said panel flange to a substantial distance above said deck, and a sealing material filling said combing about said panel flange to exclude moisture therefrom.

3. A ship bulkhead construction comprising a series of panels of sheet material each formed with vertical, reinforcing corrugations including face portions offset alternately in opposite direc-

tions substantially symmetrically with reference to a median, longitudinal plane to form the opposite side faces of the panel and connecting portions extending transversely of said longitudinal plane between said face portions with the major portion of the panel material disposed in said face portions to afford maximum reinforcement of said panel, said face portions being formed to extend into a substantially common, continuous, vertical bottom flange, a substantially channel-shaped combing arranged for attachment to a deck with the spaced flanges thereof embracing said panel flange to a substantial distance above said deck and a sealing material filling said combing about said panel flange to exclude moisture therefrom.

4. A ship bulkhead construction comprising a series of panels of sheet material formed with vertical, reinforcing corrugations, the oppositely projecting corrugation portions adjacent the bottom of each panel being formed downwardly and inwardly into a common, vertical, self-draining bottom flange, free from moisture collecting pockets, a substantially channel-shaped combing adapted for attachment to a floor deck with the spaced flanges thereof embracing said panel flange, and a sealing material filling said combing about said panel flange to exclude moisture therefrom.

5. A ship bulkhead construction comprising a series of panels of sheet material each formed with vertical, reinforcing corrugations, the projecting corrugation portions adjacent the bottom of each side of said panel being inclined inwardly and downwardly into a common, intermediate plane, with extensions in said plane forming therein a substantially continuous, vertical bottom flange, a substantially channel-shaped combing arranged for attachment to a floor deck with the spaced flanges thereof embracing and supporting said panel flange to a substantial distance above said deck, and a moldable, water-proof material filling said combing about said panel flange to exclude moisture therefrom.

6. A ship bulkhead construction comprising a series of panels of sheet material each formed with vertical, reinforcing corrugations, each of said panels having its transversely extending corrugation portions cut away adjacent its bottom and its oppositely projecting corrugation portions formed inwardly and downwardly into a common, intermediate, vertical plane, with extensions lying in said plane and overlapped and secured together to form a substantially continuous bottom flange, a substantially channel-shaped combing for attachment to a floor deck to follow the sheer and camber thereof and embracing said panel flange with a variable amount of overlap, and a moldable, water-proof material filling said combing about said panel flange to exclude moisture therefrom.

7. A ship bulkhead construction comprising a series of panels of sheet material each formed with vertical, reinforcing corrugations including face portions offset alternately in opposite directions substantially symmetrically with reference to a median, longitudinal plane to form the opposite side faces of said panel and connection portions extending transversely of said plane between said face portions with the major portion of said material disposed in said panel faces to afford maximum reinforcement of said panel, said transverse portions being cut away adjacent the panel bottom and said face portions being

formed inwardly and downwardly into a common, continuous, vertical bottom flange, a channel-shaped combing for attachment to a floor deck to follow the sheer and camber thereof with the spaced flanges of said combing embracing said panel flange with a variable amount of overlap, and a moldable, water-proof material filling said combing about said panel flange to exclude moisture therefrom.

8. A ship bulkhead comprising a series of sheet metal panels formed with vertical, reinforcing corrugations, each of said panels being cut and formed adjacent its bottom to incline the projecting corrugation portions thereof downwardly and inwardly from the opposite sides of the panel into a common, median, vertical plane, with extensions lying in said plane and overlapped and welded together to form a substantially continuous bottom flange, said cut and formed portions being welded together at the joints thereof to maintain a tight closure, a substantially channel-shaped combing for attachment to a floor deck to follow the sheer and camber of the same and embracing said panel flange with a variable amount of overlap, and mastic material filling said combing about said panel flange to exclude moisture therefrom.

9. A ship bulkhead panel made of sheet material formed with vertical, reinforcing corrugations including face portions offset alternately in opposite directions substantially symmetrically with reference to a median, longitudinal plane to form the opposite side faces of said panel and connecting portions extending transversely of said plane between said face portions so as to dispose the bulk of said material in said panel faces to afford maximum reinforcement of said panel, said offset portions being formed to extend into a common, continuous, vertical bottom flange for connection with a supporting combing fastened to a deck.

10. A ship bulkhead panel made of sheet material formed with vertical, reinforcing corrugations including face portions offset alternately in opposite directions substantially symmetrically with reference to a median, longitudinal plane to form the opposite side faces of the panel and connecting portions extending transversely of said plane between said offset portions to dispose the major portion of said material in said panel faces to afford maximum reinforcement of said panel, said transverse portions being cut away adjacent the panel bottom and said offset portions being formed inwardly and downwardly into a common, intermediate vertical plane with extensions lying in said plane and overlapped to form a continuous bottom flange for connection with a combing fastened to a deck.

11. A ship bulkhead panel made of sheet material formed with vertical, reinforcing corrugations, the projecting corrugation portions having substantially the same width as the recessed corrugation portions on each side face of said panel and said projecting corrugation portions adjacent the bottom of both said faces of the panel being inclined downwardly and inwardly to a common vertical plane and having extensions lying in said plane and providing a substantially continuous, vertical bottom flange for connection with a supporting means for said channel.

12. A ship bulkhead comprising a series of panels of sheet material, each formed with vertical, reinforcing corrugations, means for securing the bottom of said panel to a deck, continuous, horizontal means engaging and supporting the

projecting corrugation portions of said panel at its top, and a plurality of filler clips secured between said means and the recessed corrugation portions of said panel to close said recessed portions and form a tight joint.

13. A ship bulkhead comprising a series of panels of sheet material formed with vertical, reinforcing corrugations, means for securing said panels adjacent the bottom thereof to a floor deck, continuous, horizontal means for engaging and supporting said panels adjacent the top thereof, and a plurality of clips formed with wing extensions for engagement with said horizontal means to support said clips in the recessed corrugation portions of said panels to close the same and form a tight joint between said panels and members.

14. A ship bulkhead comprising a series of panels of sheet material formed with vertical, reinforcing corrugations, means for anchoring each panel adjacent its bottom to a floor deck, continuous horizontal members engaging and supporting the projecting corrugation portions on opposite sides of said panel adjacent the top thereof, and a plurality of clips fitting into and closing the recessed corrugation portions to provide a tight joint at the top of said panel, said clips having opposite wing extensions for engagement between said projecting corrugation portions and said horizontal members for supporting said clip in place.

15. A ship bulkhead comprising a series of sheet metal panels formed with vertical, reinforcing corrugations, means for securing each panel adjacent its bottom to a floor deck, continuous horizontal members for engaging and supporting the projecting corrugation portions on opposite sides of said panel adjacent the top thereof, and a plurality of sheet metal clips fitting into and closing the recessed corrugation portions adjacent said horizontal members, said clips comprising vertical and horizontal wing extensions for engaging said horizontal members and supporting said clips in place.

16. A ship bulkhead comprising a series of sheet metal panels formed with vertical reinforcing corrugations, the projecting corrugation portions on opposite sides of each panel being formed to extend into a common, substantially plane, vertical, bottom flange, a substantially channel-shaped combing for attachment to a floor deck and embracing said panel flange, sealing material filling said combing about said panel flange to exclude moisture therefrom, continuous horizontal members engaging and supporting the projecting corrugation portions on opposite sides of said panels adjacent the top thereof, and a plurality of sheet metal clips fitting into and closing the recessed corrugation portions adjacent said horizontal members to form a tight joint, and means for supporting said clips in place.

17. A ship bulkhead comprising a series of sheet metal panels formed with vertical reinforcing corrugations, the projecting corrugation portions on opposite sides of each panel being formed to extend into a common, substantially plane, vertical, bottom flange, a substantially channel-shaped combing arranged for attachment to a floor deck and embracing said panel flange, sealing material filling said combing about said panel flange to exclude moisture therefrom, continuous horizontal members engaging and supporting the projecting corrugation portions on opposite sides of said panels adjacent

the top thereof, and a plurality of sheet metal clips fitting into and closing the recessed corrugation portions adjacent said horizontal members to form a tight joint, said clips being provided with wing extensions for engagement with said horizontal members for supporting said clips in place.

18. A ship bulkhead comprising a series of sheet metal panels formed with vertical, reinforcing corrugations, each of said panels being cut and bent adjacent its bottom to form portions of said corrugations on both sides of said panel downwardly into a common, substantially plane, bottom flange, said cut and formed corrugation portions being welded together at the

5 joints thereof to maintain a tight closure, a substantially channel-shaped combing arranged for attachment to a floor deck to follow the sheer and camber thereof and embracing said panel flange with a variable amount of overlap, mastic material filling said combing about said panel flange to exclude moisture therefrom, members engaging and supporting the projecting corrugation portions on opposite sides of said panels adjacent the tops thereof, a plurality of sheet metal clips fitting into and closing the recessed corrugation portions adjacent said members to maintain a tight joint, and means for supporting said clips in place.

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