April 25, 1950 C. H. BILLS 2,505,520

BOAT CANOPY

Filed April 28, 1949 3 Sheets-Sheet 1

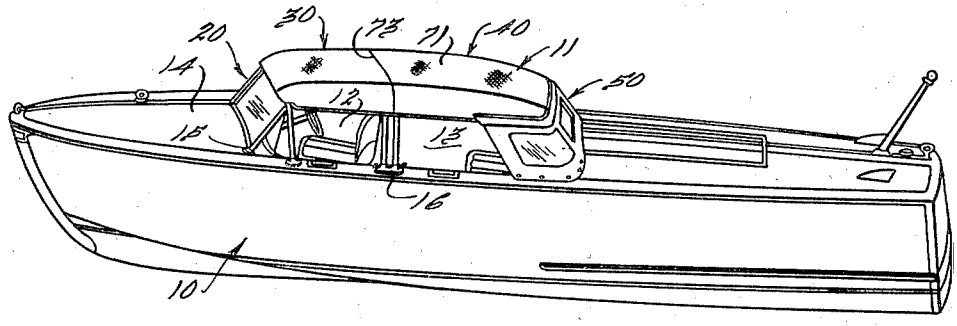



Fig. 1.

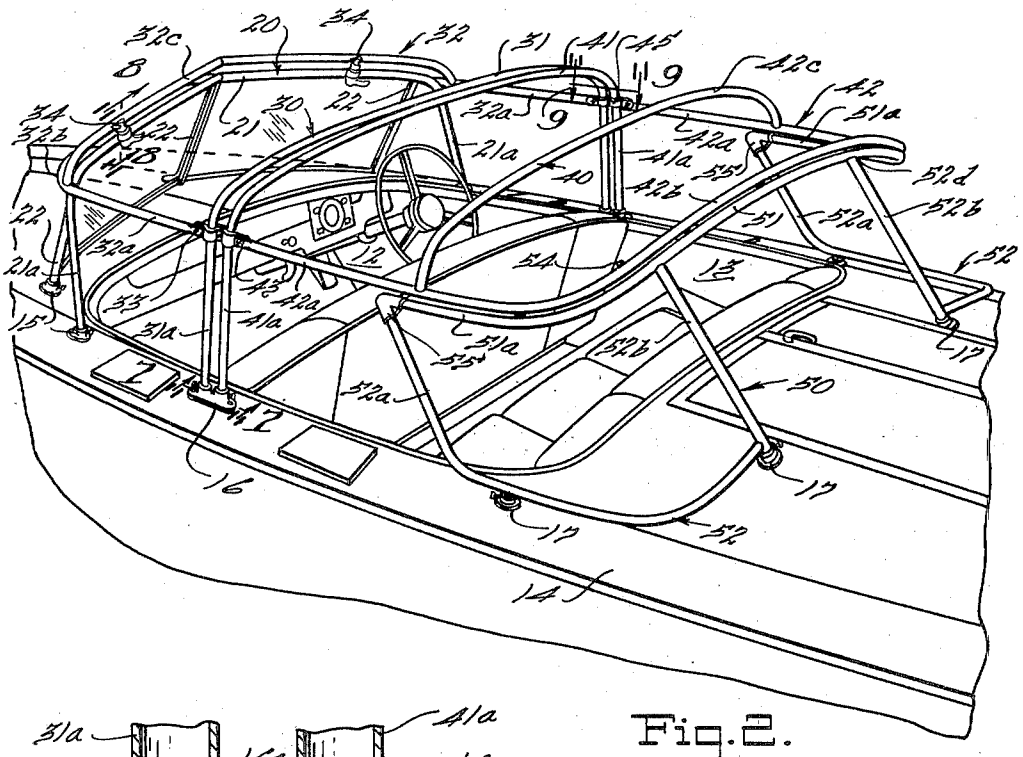



Fig. 2.

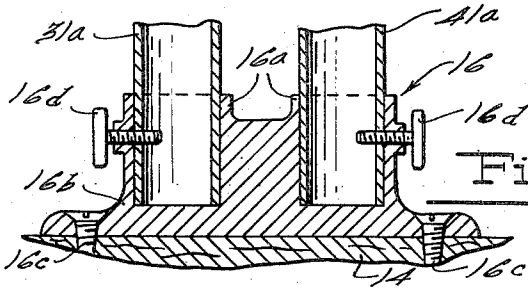



Fig. 7.

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BOAT CANOPY

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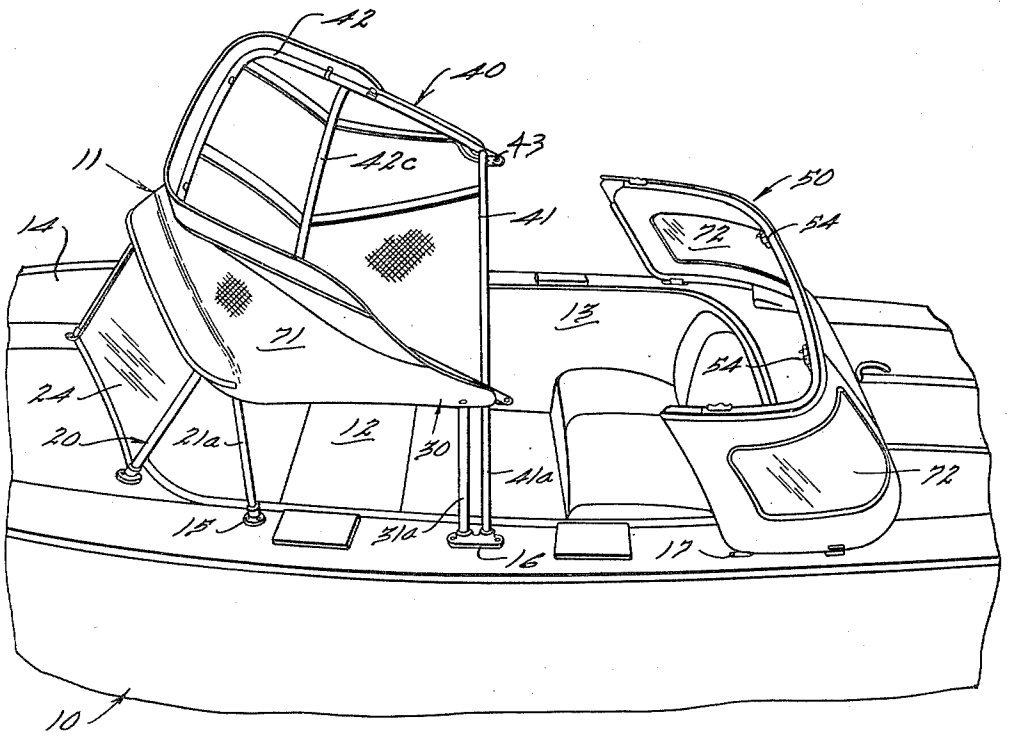



Fig. 3.

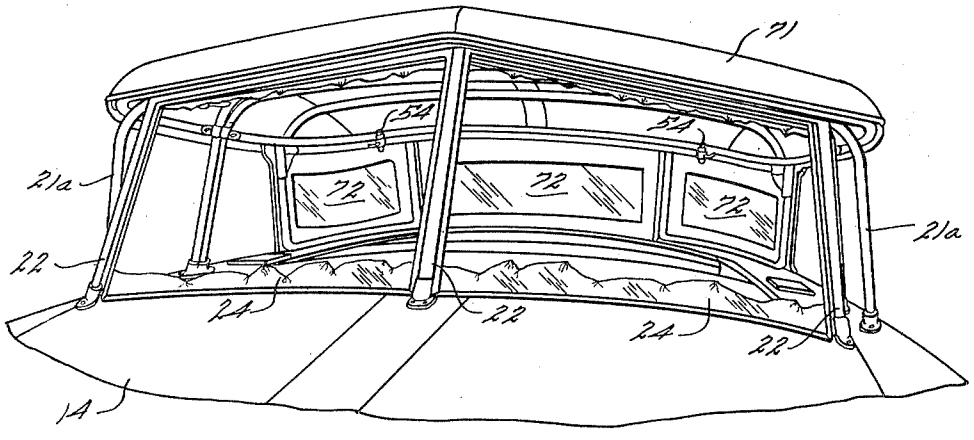



Fig. 4.

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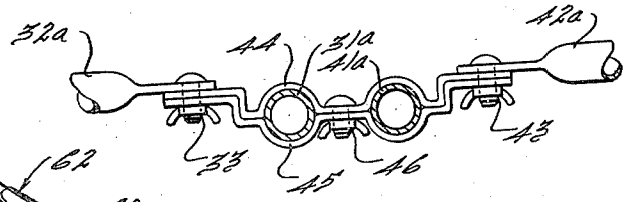



Fig. 9.




Fig. 5.

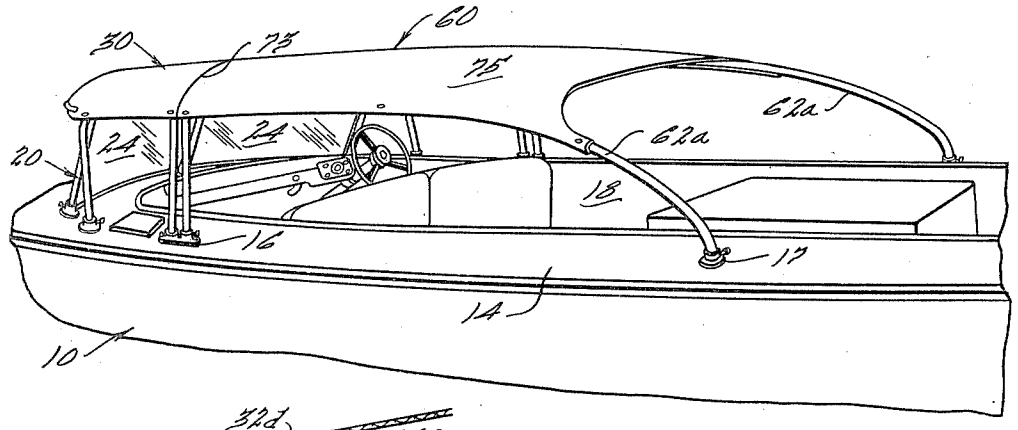



Fig. 6.

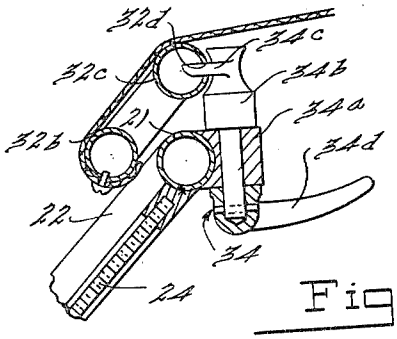



Fig. 8.

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# UNITED STATES PATENT OFFICE

2,505,520

## BOAT CANOPY

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Application April 28, 1949, Serial No. 90,131

16 Claims. (Cl. 9—1)

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This invention relates to foldable vehicle tops and particularly tops adapted for use on motor boats of the open cockpit type.

Various attempts have been made in the past to provide a trim, efficient top structure for the passenger carrying compartments of boats of the open cockpit type but such attempts have proven unsatisfactory due to the fact that such tops interfered with the quick, easy entrance into and exit from the passenger carrying compartments of such boats. The tops that have been provided for boats of this type, which did not interfere with a person boarding and leaving the boat, have usually been large, unga'nly constructions that constituted a more or less permanent part of the hull structure. Such tops destroyed the trim appearance of the boat, interfered with the visibility from within the cockpit, were relatively expensive to manufacture and install, and, because of their permanent nature, prevented ready collapsing of the top to permit the passengers to completely enjoy the out-of-doors if such should be their desire.

It is a primary object of this invention to provide a trim, inexpensive, fo'dable top or canopy for a boat of the open cockpit type, which top may have portions thereof folded to temporary positions so as to permit easy entrance to and exit from all portions of the cockpit.

It is an additional object of this invention to provide a trim top structure for an open cockpit type of boat which top appears to be a permanent part of the hull yet is adapted to be quickly and easily demounted in whole or in part.

It is a further object of this invention to provide a foldable top for a motor boat or the like which will completely cover the open cockpit and provide a satisfactory weather shield for the occupants thereof, the arrangement being such that the top in no way obstructs the visibility from within the cockpit.

It is a still further object of this invention to provide a sectional folding top for a motor boat or the like which top may be erected in whole or in part, the top construction being such that certain sections of the passenger carrying compartment of the boat may be covered while other sections are uncovered. This sectional top is such that whenever any section is erected it presents a complete, trim appearance which makes it appear to be an integral part of the hull.

Additional objects and advantages of this top construction will become apparent from a reading of the following description when taken in conjunction with the related drawings, wherein:

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Fig. 1 is a perspective view of a double compartment, open cockpit, runabout type of motor boat having a top constructed in accordance with this invention;

Fig. 2 is a fragmentary perspective view of the passenger carrying section of the boat shown in Fig. 1, the top covering being removed from the top frame to more clearly disclose the foldable sectional frame construction;

Fig. 3 is a fragmentary perspective view of the passenger carrying section of the boat and top construct'on shown in Figs. 1 and 2 with one of the intermediate top supporting frame sections shown in opened position;

Fig. 4 is a fragmentary perspective view of the top structure shown in Fig. 1, the view being taken from the bow of the boat looking through the windshield towards the stern of the boat so as to disclose the underside of the top structure;

Fig. 5 is a perspective view of a boat having a top construction which is a modified form of the invention shown in Figs. 1–4, the modified form being adapted for installation on open cockpit boats having a single passenger carrying compartment, this view showing the aft top section folded forwardly to open position;

Fig. 6 is a fragmentary side elevation of the boat shown in Fig. 5 with the several top sections in closed position;

Fig. 7 is an enlarged sect'onal elevational view of a frame supporting deck fitting;

Fig. 8 is an enlarged sectional elevation of one of the locking bolts carried by the end top sections and used to fasten the pivotally mounted intermediate top sections in closed posit'on; and

Fig. 9 is an enlarged view of one of the strap-type pivotal connections between the top runner frames and the bow supporting members of the intermediate frame sections.

In the drawings 10 represents a motor boat of the open cockpit runabout type having a demountable top structure 11 covering the passenger carrying compartments 12 and 13 of the cockpit. The top structure 11 comprises a forward windshield section 20, intermediate or amidship sections 30 and 40, and an aft section 50. Each of the frame sections 20, 30, 40 and 50 is preferably formed from a light weight, relatively strong, metallic tubing such as aluminum, a magnesium alloy, or the like. The several frame sections are removably mounted on the boat deck structure 14 by means of suitable cleats or deck fittings 15, 16, 17 which permit quick, easy installation and removal of the entire top framework 11. One preferred form of deck fitting is shown

in Fig. 7 and will be subsequently described in detail.

The windshield section 20 constitutes an end frame and comprises a transversely extending, vertically disposed, substantially U-shaped bow member 21 which has its leg portions 21*a* removably connected to the boat deck 14 by means of fitting 15. A plurality of forwardly extending, vertically disposed strut members 22 are connected between the bight portion of bow member 21 and the deck 14. Mounted between the deck 14, the struts 22, and the bow member 21 are the transparent windshield sections 24 which are formed from some shatter-proof material such as Lucite or shatter-proof glass. The windshield section 20 may be mounted on the boat deck 14 by means of the fittings 15 so that it becomes a more or less permanent part of the hull structure. It is obvious that the windshield section 20 can be used at all times regardless of whether the other sections of the top structure are erected or stowed aboard in a collapsed condition.

The intermediate or amidships frame section 30 comprises a transversely extending, vertically disposed, U-shaped, supporting bow member 31 having its leg portions 31*a* detachably connected to the deck 14 by means of the deck fittings 16. Fittings 16 (see Fig. 7) each comprise a pair of female pipe receiving sleeves 16*a* supported on a base section 16*b* that is connected to the deck 14 by means of screws 16*c*. Sleeve portions 16*a* each have a transversely extending threaded bore that receives a wing nut member 16*d* that is adapted to be turned up against the end portions of the bow member legs 31*a* mounted therein. Pivotally mounted on the upper portion of legs 31*a* of bow member 31 is a normally longitudinally extending U-shaped runner frame 32. Runner frame 32 comprises the side legs 32*a*, the bight portion 32*b* and the cross tie 32*c* that extends between the legs 32*a* adjacent the bight portion 32*b* of the runner frame. Runner frame 32 is adapted to extend between the top of windshield section 20 and the top of bow member 31 when in erected closed position. The pivotal connections 33 between the free ends of the U-shaped runner frame legs 32*a* and the bow member legs 31*a* permit the runner frame 32 to be pivoted upwardly and rearwardly so as to completely uncover the forward compartment 12 of the open cockpit and thus permit ready entrance into and exit from this portion of the cockpit. Suitable locking means 34 are provided to detachably fasten the cross tie member 32*c* of the runner frame 32 to the bow member 21 of the windshield section 20 when the runner frame 32 is in its lowered or closed position. Locking means 34 (see Fig. 8) each comprise a journal block 34*a* fixed to the bow member 21 of windshield section 20 which block rotatably supports the locking bolt 34*b*. Locking bolt 34*b* has a finger 34*c* adapted to be seated in a slot 32*d* in cross tie 32*c* when the runner frame 32 is in lowered or closed position. Locking bolt 34*b* is provided with a handle 34*d* to facilitate rotation thereof.

Amidships frame section 40 includes a transversely extending, vertically disposed, supporting bow member 41 having its leg portions 41*a* removably mounted in the deck fittings 16 in the same manner as described with regard to the legs 31*a* of bow 31. Pivotally connected at 43 to the upper portion of the legs 41*a* of bow member 41 is a normally longitudinally extending, U-shaped, runner frame 42. The free ends of the



legs 42*a* of runner frame 42 are pivotally connected at 43 to the bow member 41 in such a manner that runner frame 42 may be swung upwardly and forwardly to uncover the rear passenger carrying compartment 13 of the open cockpit. Runner frame 42 includes the bight portion 42*b* and an auxiliary bow strut or cross tie 42*c* which provides additional support for the aft portion of top covering 71 carried by the runner frame 42. The runner frame 42 is adapted to extend between bow member 41 and the aft frame section 50 when it is in its lowered or closed position. The pivotal connections 33 and 43 of the runner frames 32 and 42 to the bow members 31 and 41 respectively are clearly disclosed in Fig. 9. A pair of flat straps 44 and 45 are connected to the spaced bow member legs 31*a* and 41*a* by the winged bolt 46. Straps 44 and 45 receive the pivot pins 33 and 43 on which are pivotally mounted the flattened ends of the runner frame legs 32*a* and 42*a* respectively. The straps 44 and 45 not only provide the pivot mountings for the runner frames 32 and 42 but in addition these straps tie the bow members 31 and 41 together and rigidify the top structure.

The aft frame section 50 comprises an elevated, normally horizontally disposed, transversely extending, U-shaped bow member 51 supported at each of its ends by the normally vertically disposed U-shaped frame sections 52. The frame sections 52 are detachably mounted on the deck structure 14 by means of deck fittings 17 which are similar to the fittings 16 shown in Fig. 7 of the drawings but include only a single sleeve member instead of the pair of pipe receiving sleeves 16*a* carried by the fittings 16. The ends 51*a* of bow member 51 are connected to the legs or struts 52*a* of the supporting frames 52 by the triangular shaped brace plates 55. The other struts or legs 52*b* of the U-shaped supporting frames 52 are permanently connected at 52*d* to the bight portion of bow member 51 by welding, brazing, or the like.

Aft frame section 50 includes suitable fastening means 54, similar to the locking means 34 shown in Fig. 8, which fasteners are adapted to detachably lock the rearwardly extending runner frame 42 to the bow member 51 of aft frame section 52 when runner frame 42 is in its lowered or closed position.

It will be noted from Figs. 2 and 3 that either or both of the amidships runner frames 32 and 42 may be pivoted upwardly to uncover the passenger carrying compartments 12 and 13 of the open cockpit. This arrangement permits quick, easy entrance into and exit from the compartments 12 and 13 of the cockpit when boarding or leaving the boat.

The several top sections 30, 40 and 50 are each covered with a waterproof material 71 such as canvas, nylon, or some similar material. The covering material 71 for frame section 50 has a plurality of windows 72 formed therein and these windows are covered with a transparent material which may be similar to the material used in the windshield sections 24. It is apparent from Fig. 4 that the major portion of the covering for frame section 50 is transparent so as to provide perfect visibility in all directions from within the boat cockpit. The covering 71 for the runner frames 32 and 42 is preferably made in two sections with detachable fastening means 73 such as zippers or snap fasteners connecting these two sections in such a way that a watertight joint is provided. The detachable connection between

these sections is such that it does not interfere with the smooth outer contour of the top covering at the point where the sections of the top 71 are jointed together.

In the event it is desired to operate the boat with one portion of the open cockpit covered and another portion uncovered it is a simple matter to release the appropriate detachable fastening means 34 or 54 associated with the runner frame section that is to be removed, to then disconnect the detachable fasteners 73, after which the appropriate bow member 31 or 41 is disconnected from the fittings 16 and the straps 44 and 45. To remove any or all of the sections of the top frame is a relatively simple matter due to the easily operable, detachable connections between the boat hull and the various frame sections. The demounted frame sections may be stowed aboard the boat or on shore in a minimum of space. Due to the light weight construction of this top frame it may be easily and quickly installed, removed or operated to suit the convenience of the boat occupants. The forward windshield section 20 is usually left in erected position whether the other top sections are erected or demounted. Windshield section 20 has a minimum of framework and it provides a sturdy windshield with maximum visibility as well as a trim appearance that blends into the hull design.

The modified form of the invention shown in Figs. 5 and 6 differs from that shown in Figs. 1–4 in that the aft frame section 50 has been eliminated. This modified form of the invention is primarily designed for open cockpit boats having a single passenger carrying compartment 18 as contrasted with the multiple compartment type of boat shown in Figs. 1–4. The windshield section 20 and the amidships section 30 of the top construction shown in Figs. 5 and 6 are identical to those used in the construction shown in Figs. 1 to 4. The aft frame section 60, shown in Figs. 5 and 6, comprises a transversely extending U-shaped bow member 61 having legs 61*a* detachably connected to the amidships bow section 31 by straps 44, 45 and releasably fastened to the boat deck 14 by the deck fittings 16. Pivotally connected at 63 to the upper portions of the legs 61*a* of bow member 61 is the H-shaped, runner frame 62. Strap type pivot members 44, 45 connect the ends of runner frame legs 62*a* to the bow member 61 in a manner identical to that described for the runner frames 32 and 42. The tie portion 62*b* of the H-shaped runner frame 62 provides a support for the rear portion of the top covering 75 mounted on the top frame section 60. Deck fittings 17 are provided to anchor the free ends of runner frame legs 62*a* to the deck 14. Fittings 17 are provided with winged bolts similar to those shown at 16*d* of Fig. 7. With the construction shown in Figs. 5 and 6 the top cover 75 is terminated at the tie strut 62*b* but, if necessary, an additional section of top covering could be provided to extend from the tie strut 62*b* to the deck 14 at the rear of the open cockpit. Any sort of detachable fasteners could be used to connect this additional piece of covering to the top and boat deck.

With the constructions shown in Figs. 5 and 6 the aft runner frame 62 may be quickly and easily pivoted upwardly and forwardly to permit entrance and exit of the boat occupants into and out of the open cockpit. If it is desired to have the forward portion of the cockpit covered and the rear portion of the cockpit open it is a simple matter to remove the runner frame 62 to uncover



the rear portion of the cockpit. The runner frame 62 may be knocked down and stowed aboard the boat so that it is readily available for installation in the event this portion of the top is needed to shelter the occupants from the weather.

I claim:

1. A boat top comprising a pair of end frame sections and a pair of intermediate frame sections, said end frame sections each comprising a plurality of supporting struts having transparent panels mounted therebetween, and said intermediate frame sections each comprising a supporting frame member and a runner frame pivotally connected to said supporting frame member, each of said runner frames being adapted to extend between the supporting frame pivotally connected thereto and an end frame section, and means for detachably fastening each runner frame to the end frame section associated therewith.

2. A boat top comprising a pair of end frame sections and a pair of intermediate frame sections, said end frame sections each comprising a plurality of supporting struts having transparent panels mounted therebetween, and said intermediate frame sections each comprising a supporting frame member and a runner frame pivotally connected to said supporting frame member, each of said runner frames being adapted to extend between the supporting frame pivotally connected thereto and an end frame section, means for detachably fastening each runner frame to the end frame section associated therewith, and a flexible top covering mounted on each of said runner frames.

3. A boat top comprising a pair of end frame sections and a pair of intermediate frame sections, said end frame sections each comprising a plurality of supporting struts having transparent panels mounted therebetween, and said intermediate frame sections each comprising a supporting frame member and a runner frame pivotally connected to said supporting frame member, each of said runner frames being adapted to extend between the supporting frame pivotally connected thereto and an end frame section, means for detachably fastening each runner frame to the end frame section associated therewith, and a flexible top covering mounted on each of said runner frames, said top coverings including detachable fastening means to connect the covering sections mounted on the several runner frames.

4. The combination with an open cockpit type of boat including a deck and forward and aft passenger carrying compartments, of a windshield section mounted on the deck in front of said forward compartment, a first intermediate top section detachably connected to said deck between said compartments and including a pivotally mounted top portion adapted to extend between said windshield and said aft compartment, a second intermediate top section detachably connected to said deck between said compartments and including a pivotally mounted top portion adapted to extend over said aft compartment, and an end frame section detachably mounted on the deck rearwardly of the aft compartment and adapted to provide a support for said last-mentioned pivotally mounted top portion.

5. The combination with an open cockpit type of boat including a deck and forward and aft passenger carrying compartments, of a windshield

section mounted on the deck in front of said forward compartment, a first intermediate top section detachably connected to said deck between said compartments and including a pivotally mounted top portion adapted to extend between said windshield and said aft compartment, a second intermediate top section detachably connected to said deck between said compartments and including a pivotally mounted top portion adapted to extend over said aft compartment, and means adapted to detachably anchor said pivotally mounted top portions in positions covering said passenger carrying compartments.

6. A boat top comprising a windshield section, an end section, and a pair of top supporting sections, each of said top supporting sections comprising a U-shaped supporting member and a U-shaped runner frame, means pivotally connecting the legs of each U-shaped runner frame to a supporting member and means adapted to detachably connect one of said runner frames to each of said windshield and end sections respectively, said runner frames each mounting a flexible top covering.

7. A boat top comprising a windshield section and a pair of top sections, said top sections each comprising a U-shaped supporting member and a runner frame pivotally connected thereto, means to detachably anchor one of said runner frames to said windshield section and means to detachably anchor said other runner frame in a position in alignment with the first mentioned runner frame, said runner frames each supporting a flexible top covering.

8. A boat top comprising a windshield section and a pair of top sections, said top sections each comprising a U-shaped supporting member and a runner frame pivotally connected thereto, means to detachably anchor one of said runner frames to said windshield section and means to detachably anchor said other runner frame in a position in alignment with the first mentioned runner frame, said runner frames each supporting a flexible top covering, and detachable clamping means to connect said supporting members.

9. A top structure for the open cockpit of a boat provided with a deck and a windshield section comprising a first top section having a first bowed supporting member, means to detachably erect said first supporting member on said deck, a first bowed runner frame having the leg portions thereof pivotally connected to said first supporting member, and means to detachably connect said first runner frame to said windshield section, a second top section comprising a second bowed supporting member, means to detachably erect said second supporting member on said deck, a second bowed runner frame having the leg portions thereof pivotally connected to said second supporting member, means to detachably connect said second supporting member to said deck, rigid means adjacent the runner frame pivot connections to the supporting members to detachably connect said first and second supporting frames together, and an end frame comprising spaced struts and connecting members having portions to be detachably mounted on said deck and other portions to be detachably connected to said second runner frame.

10. A top structure for the open cockpit of a boat provided with a deck and a windshield section comprising a first top section having a first bowed supporting member, means to detachably erect said first supporting member on said deck, a first bowed runner frame having the leg portions thereof pivotally connected to said first supporting member, and means to detachably connect said first runner frame to said windshield section, a second top section comprising a second bowed supporting member, means to detachably erect said second supporting member on said deck, a second bowed runner frame having the leg portions thereof pivotally connected to said second supporting member, means to detachably connect said second supporting member to said deck, and an end frame comprising spaced struts and connecting members having portions to be detachably mounted on said deck and other portions to be detachably connected to said second runner frame.



11. In combination with a boat having a normally open cockpit, a deck surrounding said cockpit and a windshield section mounted on said deck forward of and transversely to said cockpit, a top for said open cockpit comprising a forward top section, and an aft top section and means for detachably connecting said top sections to the deck, said forward and aft top sections each comprising a vertically extending, bow member disposed transversely of the cockpit and a runner frame having portions thereof pivotally connected to a bow member so as to permit each runner frame to normally extend in a horizontal direction lengthwise of the cockpit but allowing each runner frame to be pivoted to a substantially vertical position with respect to said cockpit, means detachably connecting the bow members of the forward and aft top sections, and means to detachably connect the forward runner frame to the windshield section and the aft runner frame to the deck when said runner frames are substantially horizontally disposed.

12. In combination with a boat having a normally open cockpit, a deck surrounding said cockpit and a windshield section mounted on said deck forward of and transversely to said cockpit, a top for said open cockpit comprising a forward top section, an aft top section and an end section, and means for detachably connecting said top and end sections to the deck, said forward and aft top sections each comprising a U-shaped, vertically extending, bow member disposed transversely of the cockpit and a U-shaped runner frame having the leg portions thereof pivotally connected to a bow member so as to normally extend in a horizontal direction lengthwise of the cockpit but arranged to be pivoted to a substantially vertical position with relation to said cockpit, each of said runner frames including a cross tie between the frame legs adjacent the bight portion of the frame, strap plates adapted to detachably connect the bow members of the forward and aft top sections, and means to detachably connect the forward runner frame to the windshield section and the aft runner frame to the end section when said runner frames are substantially horizontally disposed.

13. In combination with a boat having a normally open cockpit, a deck surrounding said cockpit and a windshield section mounted on said deck forward of and transversely to said cockpit, a top for said open cockpit comprising a forward top section and an aft top section and means for detachably connecting said top sections to the deck, said forward top section comprising a U-shaped, vertically extending, forward bow member disposed transversely of the cockpit and a U-shaped forward runner frame having the leg portions thereof pivotally connected to said forward bow member so as to normally extend in

a horizontal direction lengthwise of the cockpit but arranged to be pivoted to a substantially vertical position with relation to said cockpit, said aft top section comprising a U-shaped, vertically extending aft bow member disposed parallel to and adjacent said forward bow member, an H-shaped aft runner frame having the leg portions thereof pivotally connected to said aft bow member so as to normally extend in a horizontal direction lengthwise of the cockpit but arranged to be pivoted to a substantially vertical position with relation to said cockpit, strap plates adapted to detachably connect the bow members of the forward and aft top sections, and means to detachably connect the forward runner frame to the windshield section and the aft runner frame to the deck when said runner frames are substantially horizontally disposed.

14. In a boat having a hull provided with decking, an open cockpit extending longitudinally of the boat, a vertically extending windshield section mounted on the decking and positioned transversely of the boat forward of the cockpit, a top structure including a first top section comprising a first vertically extending support detachably mounted on the decking so as to extend transversely of the cockpit intermediate the ends thereof, a first runner frame pivotally connected to said first support so as to normally extend horizontally above said cockpit between said windshield section and said first support, said pivotal connection permitting movement of said first runner frame to a vertical position, means to detachably connect said first runner frame to said windshield section, a second top section comprising a second vertically extending support detachably mounted on the decking so as to extend transversely of the cockpit adjacent said first support, a second runner frame pivotally connected to said second support and having portions thereof arranged so as to normally extend horizontally above said cockpit between the aft end of the cockpit and said second support, said pivotal connection permitting movement of said second runner frame to a vertical position, and means to detachably connect portions of said second runner frame to the decking aft of the cockpit.

15. In a boat having a hull provided with decking, an open cockpit extending longitudinally of the boat, a vertically extending windshield section mounted on the decking and positioned transversely of the boat forward of the cockpit, a vertically extending end section detachably mounted on the decking aft of the cockpit and transversely thereof, a top structure including a first top section comprising a first vertically



extending U-shaped support detachably mounted on the decking so as to extend transversely of the cockpit intermediate the ends thereof, a first U-shaped runner frame pivotally connected to said first support so as to normally extend horizontally above said cockpit between said windshield section and said first support, said pivotal connection permitting movement of said first runner frame to a vertical position, means to detachably connect said first runner frame to said windshield section, a second top section comprising a second vertically extending U-shaped support detachably mounted on the decking so as to extend transversely of the cockpit adjacent said first support, a second U-shaped runner frame pivotally connected to said second support so as to normally extend horizontally above said cockpit between said end section and said second support, said pivotal connection permitting movement of said second runner frame to a vertical position, and means to detachably connect said second runner frame to said end section.

16. In a boat having a hull provided with decking, an open cockpit extending longitudinally of the boat, a vertically extending windshield section mounted on the decking and positioned transversely of the boat forward of the cockpit, a top structure including a first top section comprising a first vertically extending U-shaped support detachably mounted on the decking so as to extend transversely of the cockpit intermediate the ends thereof, a first U-shaped runner frame pivotally connected to said first support so as to normally extend horizontally above said cockpit between said windshield section and said first support, said pivotal connection permitting movement of said first runner frame to a vertical position, means to detachably connect said first runner frame to said windshield section, a second top section comprising a second vertically extending U-shaped support detachably mounted on the decking so as to extend transversely of the cockpit adjacent said first support, a second H-shaped runner frame pivotally connected to said second support and having portions thereof arranged so as to normally extend horizontally above said cockpit between the aft end of the cockpit and said second support, said pivotal connection permitting movement of said second runner frame to a substantially vertical position, and means to detachably connect said second runner frame to the decking aft of the cockpit.

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No references cited.