Feb. 18, 1958 O. F. SARTORI 2,823,684

CANOPY FOR BOATS

Filed Jan. 20, 1956 2 Sheets-Sheet 1

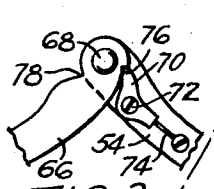


FIG. 3

FIG. 1

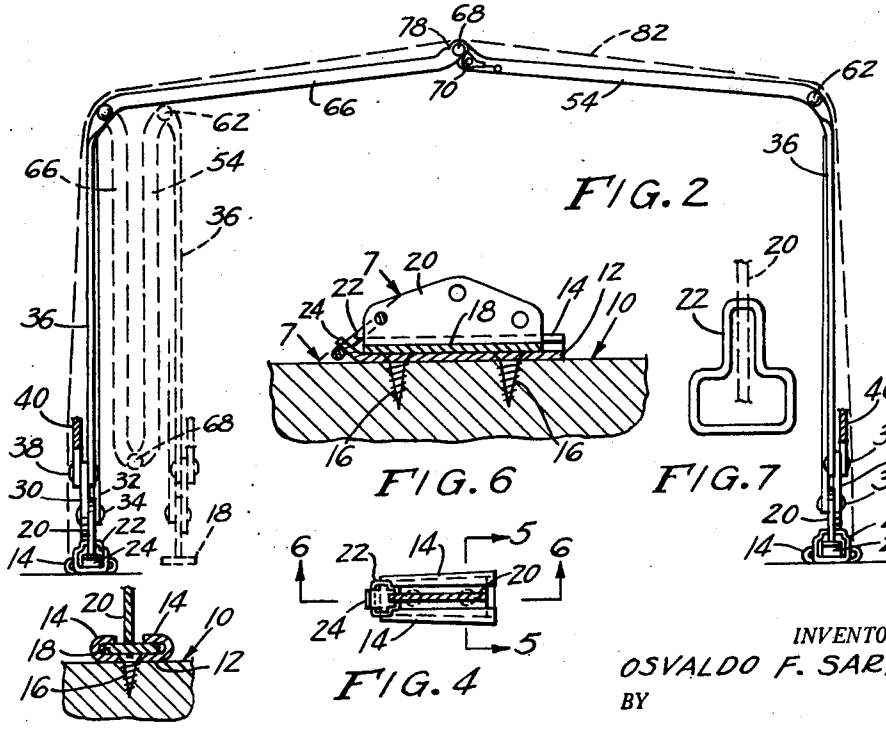


FIG. 2

FIG. 5

FIG. 6

FIG. 4

FIG. 7

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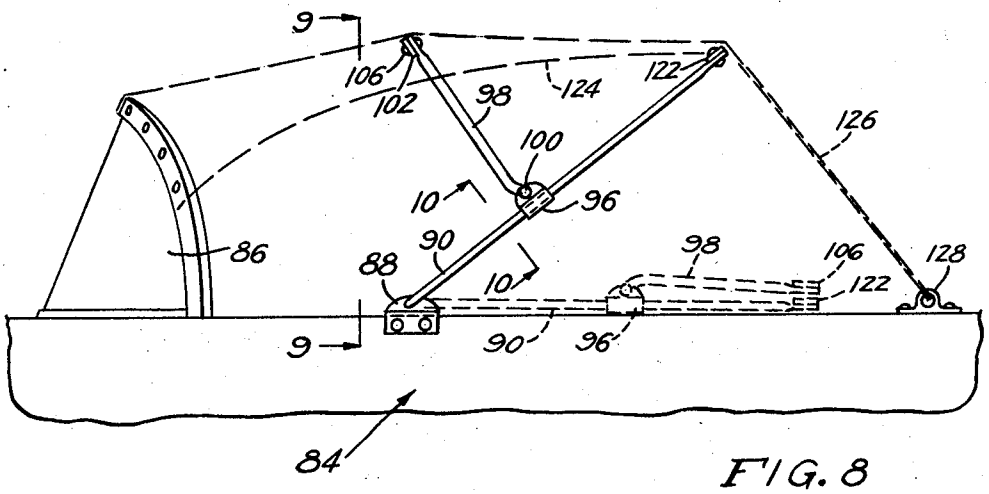


FIG. 8

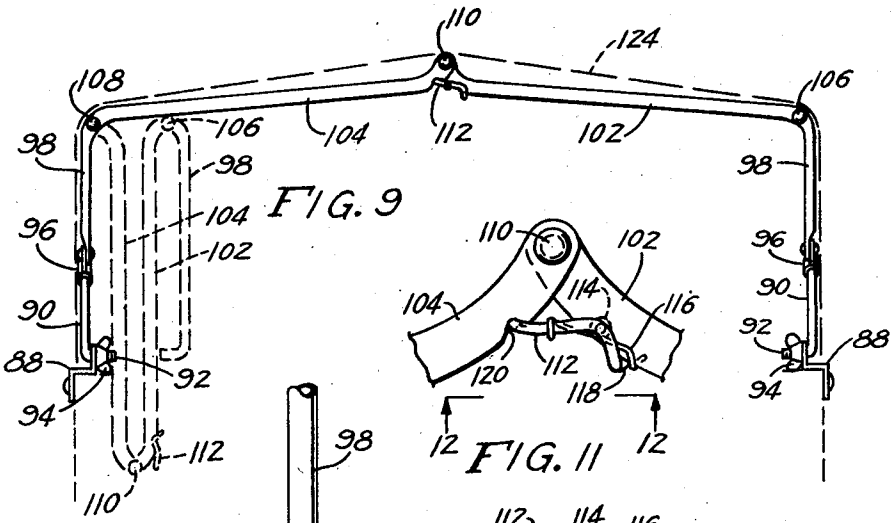


FIG. 9

FIG. 11

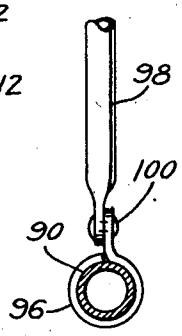


FIG. 10

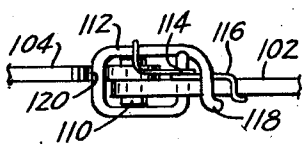


FIG. 12

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CANOPY FOR BOATS

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Application January 20, 1956, Serial No. 560,320

3 Claims. (Cl. 135—6)

This invention relates to boat canopies, and more particularly has reference to a canopy adapted to be folded into a highly compact article, so as to occupy a minimum of space when not in use, with the canopy being extendable over a substantial area when in use for the purpose of providing protection for the boat occupants.

One important object of the present invention is to provide a canopy which will be swiftly removable from position after being collapsed, so as to be adapted to be packed into a relatively small bag, or other container, and stored away in a suitable space.

A further object is to provide a canopy which will be particularly designed to be foldable in two directions, that is both transversely and longitudinally of the boat, with the canopy when folded longitudinally being so disposed as to be capable of being swiftly erected in extended position, this being desirable in the event of a sudden squall, etc. The canopy, when folded transversely, is adapted to be disposed against the side of the boat, in an out-of-the-way position, and in this stage of collapse of the canopy, can be removed bodily from brackets provided upon the boat, for storage.

A further object of importance is too provide an improved means for detachably connecting the canopy to said brackets.

A further object of importance is to provide an improved assembly of connected supports or braces, which assembly will be especially adapted for facilitating the adjustment of the component parts thereof between fully collapsed and extended positions.

A further object is to design the canopy in such a manner as to provide a strong bracing of the covering thereof whenever the canopy is extended.

Still another object of importance is to form a canopy of the type described which can be mounted on any of various small or large boats, such as row boats, sea skiffs, cabin cruisers, etc.

Still another object is to provide a canopy of the type referred to which will be capable of manufacture at low cost, can be mounted upon the boat without the requirement of specially skilled workers, and will be designed to facilitate replacement of the covering thereof whenever desired.

Other objects will appear from the following description, the claims appended thereto, and from the annexed drawing, in which like reference characters designate like parts throughout the several views, and wherein:

Figure 1 is a side elevational view of a canopy frame formed according to the present invention, mounted upon a boat only a fragmentary portion of which is shown, the dotted lines showing the frame in collapsed position;

Figure 2 is a transverse sectional view substantially on line 2—2 of Figure 1;

Figure 3 is an enlarged, detail sectional view showing the connection between the transverse brace members;

Figure 4 is a horizontal sectional view of the support bracket, substantially on line 4—4 of Figure 1;

Figure 5 is an enlarged transverse sectional view through the bracket on line 5—5 of Figure 4;

Figure 6 is an enlarged longitudinal sectional view through the bracket on line 6—6 of Figure 4;

Figure 7 is a front elevational view, on an enlarged scale, of the keeper of the bracket;

Figure 8 is a view similar to Figure 1 showing a modified construction;

Figure 9 is a transverse sectional view on line 9—9 of Figure 8;

Figure 10 is an enlarged, detail sectional view on line 10—10 of Figure 8;

Figure 11 is an enlarged, fragmentary front elevational view of the connection between the transverse brace members, in the form of the invention shown in Figure 8; and

Figure 12 is a fragmentary bottom plan view of the transverse brace members as seen from the line 12—12 of Figure 11.

Referring to the drawings in detail, the reference numeral **10** generally designates a boat on which the canopy may be mounted. The boat can be of any of various types, and the canopy is particularly designed to be removably mounted upon the boat, so that the canopy can be dismounted in its entirety, or alternatively, collapsed against one side of the boat where it will be ready to be erected swiftly in the event of an emergency making desirable the protection of the boat occupants.

The canopy includes a pair of support plates **12** secured by screws **16** to the opposite sides of the boat, in transverse alignment. The plates **12** extend longitudinally of the boat, each plate being formed with inwardly turned side flanges **14**.

Removably engageable in the respective plates **12** are brackets of inverted T-shape in cross section, said brackets including bottom plates **18** slidably engageable in the flanged plates **12**, and upstanding plate members **20**. Pivotally connected to the forward edges of the plate members **20** are keepers **22**, the particular shape of which is shown in Figure 7. Each keeper, as will be seen, includes a reduced inner end portion and a wider outer end portion, the inner end portion having a bight extending through an opening formed in the upstanding plate member **20**. The keepers swing upwardly and downwardly upon their associated plate members **20**, and integrally formed on the front ends of the plates **12** are upwardly inclined tongues or extensions **24**, over which the keepers **22** are adapted to engage. It will be seen that whenever the keepers are engaged with the tongues, the plate members **20** are held against movement in either direction longitudinally of their associated support plates **12**. The inclined tongues **24** prevent movement of the plate members **20** to the left in Figure 6, by engaging the forward edges of the bottom plates **18** of the brackets, while the keepers, engaging the tongues **24**, prevent movement of the brackets in an opposite direction.

It will be understood that brackets of the type described are attached to both sides of the boat, and that the side rib assemblies, to be discussed immediately hereinafter, are duplicated at the opposite sides. Accordingly, the description of the ribs on one side will suffice for those on the other.

Each side rib assembly includes a main rib **26** having at its inner end a curving extension, said extension being curved through approximately 90 degrees and being extended in contact with the upstanding plate member **20** of the bracket. The main rib **26** is a stationary rib, being fixedly connected to the bracket in a position in which the elongated, straight main portion of the main rib extends in closely spaced, parallel relation to the top edge of the associated side wall of the boat.

The extension of the main rib **26** is connected to the plate member **20** by a bolt or pin **28**, at the inner end of said extension. The outer end of the extension projects upwardly from the plate member **20**, as at **30**. A second side rib **32** is pivotally connected by a pin **34** to the plate member **20**, the pin **34** passing through the curved extension **30** of the side rib **26** to cooperate with the pin **28** in fixedly connecting the main rib to the bracket. The rib **32** is spaced from a third rib **36** pivotally connected to the upper end of extension **30** by a pin **38**, at one side of extension **30**. At the other side of the extension **30**, a fourth rib **40** is connected to the extension by said pin **38**.

Extending between the ribs **40**, **26** is a jointed locking brace comprising brace elements **42**, **44** pivotally connected at their outer ends to the ribs **40**, **26** and pivotally connected at their inner ends to each other by means of a pin **46**. The member **44** has a locking extension **48** extending beyond the pin **46**, said extension **48** having a flange adapted to engage with the brace member **42** when the members **42**, **44** are extended in longitudinal alignment, so as to constitute said members as a rigid brace when the canopy is raised.

Transverse brace members **50**, **52**, **54**, **56** are pivotally connected at **58**, **60**, **62**, **64** respectively to the outer ends of the ribs **26**, **32**, **36**, **40** respectively. Referring now to Figure 2, the transverse brace members connected to the side ribs at one side of the boat are pivotally connected, at their inner ends, to the inner ends of corresponding brace members connected to the side ribs of the other side of the boat. Thus, as shown in Figure 2, brace member **54** is connected to a brace member **66**, the connection being effected by pivot pin **68** passing through the overlapping inner ends of the brace members **54**, **66**. The other transverse brace members are similarly connected to associated transverse brace members extending from the other side of the boat.

A locking hinge connection is employed between the brace members. This is shown to particular advantages in Figure 3, wherein it is seen that the member **54** is provided with a pawl **70**, adjacent the pivot pin **68**. The pawl **70** is pivotally mounted upon a pin **72**, and is normally urged in a counterlockwise direction about said pin, viewing the same as in Figure 3, by means of a spring **74** connected between the pawl and a screw attached to the member **54**.

The member **66**, adjacent the pivot pin **68**, has a small locking notch **76**, and spaced approximately 180 degrees about the pivot axis **68**, is a wide, flaring notch **78** formed upon the member **66**.

When the transverse brace members or cross ribs are extended across the boat, as shown in full lines in Figure 2, the pawl will ride upon the rounded end edge of the cross rib **66**, until it engages in the notch **76**, the pawl being biased in said notch by the spring **74**. This locks the ribs **54**, **66** against collapse. At such time as it is desired to collapse the ribs, the pawl is pressed downwardly, to the right of the pivot **72**, to disengage the same from the notch **76**. Then, the ribs **54**, **66** are swung downwardly, to the dotted line positions shown in Figure 2, and when they are fully collapsed, they extend in substantially parallel relation, in approximately vertical paths. The pawl by this time will have moved about the rounded edge of the member **66** once again, and in the fully collapsed positions of the ribs **54**, **66** will engage in the wide, flaring notch **78**.

Designated at **80** is a windshield of the boat, and at **82** there has been shown in dotted lines a covering of the canopy assembly. The covering is connected at its forward edge to the windshield, and at its rear edge is connected to the outer ends of the main ribs **26**. The covering, as will be understood, is tensioned over the sides and top of the canopy frame as shown in Figure 2, and when the canopy frame is fully collapsed, the covering is collapsed in folds between the several pairs of cross ribs.

When the canopy frame is collapsed, as a first step the covering is removed, after which the canopy frame is swung to the dotted line position of Figure 1, the several side ribs swinging upon the pins **34**, **38**. Then, the hinge lock of the cross ribs is disengaged in the manner previously described herein, and the cross ribs are folded, with the bracket plate **18**, **20** at one side of the boat removed from its associated support plate **12**. This permits the canopy to be folded transversely of the boat as shown in Figure 2. Thus, the canopy is fully collapsed by first swinging the side ribs about horizontal axes extending transversely of the canopy and defined by the pins **34**, **38**, and then by collapsing the transverse bracing means by relative pivotal movement of the cross ribs about horizontal axes extending normally to the first named axes, that is longitudinally of the boat. The longitudinal axes are defined by the pivot pins **62**, **68** in Figure 2.

As previously noted, the side rib assembly at one side of the boat is removed from its associated support plate **12** during the collapse of the canopy frame. Then, the canopy frame is disengaged from the support plate **12** at the other side of the boat, and this permits the entire canopy frame to be removed and packed away in a relatively small area. A suitable bag or container can be provided for the collapsed frame capable of being packed in a storage locker or the like.

In Figures 8–12 there is shown a modified construction, mounted upon a boat generally designated at **84** having a windshield **86**. In this form of the invention, there are provided stationary support brackets **88** of zig-zag or Z-shape as shown in Figure 11, these being integrally formed with upstanding plate members having openings receiving the inwardly turned extensions **92** of main side ribs **90**.

The extensions **92** are threaded to receive wing nuts **94**, which are turned home against the brackets to hold the side ribs assembled with the brackets.

Receiving the intermediate portions of the side ribs **90** are sleeves **96**, having upwardly projecting ears. Auxiliary side ribs **98** are pivotally connected at **100** to the ears, and at their outer ends the auxiliary ribs are respectively connected to cross ribs **102**, **104** by means of pivot pins **106**, **108**. The cross ribs are pivotally connected to each other at their inner ends as at **110**, and pawl means **112** is employed to hold the cross ribs in their extended position.

The pawl means has been shown in detail in Figures 11 and 12, and comprises a stout piece of wire or rod material bent to a rectangular shape, one end **114** of the pawl extending through an opening formed in the inner end portion of the cross rib **102**. A spring **116** has an intermediate coil passing about the end **114**, one end of the spring being engaged under the cross rib **102** and the other end bearing against the underside of the pawl **112** to normally urge the same upwardly. Limiting downward swinging movement of the pawl against the restraint of the spring is a lateral extension **118** formed upon one end of the pawl and bearing against the underside of the cross rib **102**.

At its outer end, the pawl has a transverse portion removably engaging in a downwardly opening notch **120** of the cross rib **104**.

In this arrangement, to open or collapse the hingedly connected cross ribs one pulls downwardly upon the pawl or lock element **112**, to swing the same out of engagement with the notch. This frees the cross ribs for downward swinging movement.

Whenever the canopy frame is to be collapsed and removed, the wing nut **94** at one side is removed, and the main side rib at this side is disengaged from the associated support bracket **88**. This permits the canopy frame to be collapsed in a transverse direction to the dotted line position shown in Figure 9, and of course, the canopy frame may now also be collapsed in a longitudinal direction, that is, about the horizontal transverse axis defined by the extensions **92**, with the side rib **98** being swing-

able about the pin **100** into closely spaced relation to the main rib **90** as shown in dotted lines in Figure 8.

When the frame is open, a covering **124** is connected between the windshield **86** and the cross ribs **122** extending between the outer ends of the main ribs **90**. Tie straps **126** are then tensioned between the outer ends of the side ribs **90** and brackets **128** that are secured to the sides of the boat.

In both forms of the invention, there is the characteristic wherein the canopy frame can be swiftly adjusted to collapsed or extended positions, with said frame being adapted to be left partially collapsed following folding of the several ribs about the horizontal, transverse axes, the canopy frame being alternatively capable of being fully collapsed and removed by transverse folding and detachment from the associated stationary brackets carried by the sides of the boat.

It may be noted that the canopy frame shown in Figure 1 is adapted to be used at locations other than on boats. For example, the canopy frame of Figure 1 might be used in providing a pup tent, so that one could remove the frame, and erect the same on the ground to provide shelter overnight. In this event, the covering would have an extension portion extending from the rib **40** at an incline to the ground surface and connected to the main covering portion designated at **82** in Figure 1.

It is believed apparent that the invention is not necessarily confined to the specific use or uses thereof described above, since it may be utilized for any purpose to which it may be suited. Nor is the invention to be necessarily limited to the specific construction illustrated and described, since such construction is only intended to be illustrative of the principles of operation and the means presently devised to carry out said principles, it being considered that the invention comprehends any minor change in construction that may be permitted within the scope of the appended claims.

What is claimed is:

1. A canopy frame comprising a pair of channel-shaped support plates adapted to be fixed axially on the upper edges of the opposing sides of a boat, a bracket member slidably and removably engageable in each support plate and having upstanding mounting portions, means for locking the bracket members in place in the support plates, a main side rib having an end disposed alongside the mounting portion, said main side rib being adapted to extend axially from the bracket member substantially in a horizontal plane, said end of the main side rib being upwardly curved and pivoted to the mounting portion, at least one other side rib pivoted at its lower end to the mounting portion and to the end of the main side rib and at least two additional side ribs pivoted at their lower ends, to the curved end of the main rib, brace means connected between the main side rib and one of said additional side ribs, said side ribs constituting a side rib assembly and being movable about their respective pivots from a collapsed position to a raised position in which they are spaced apart and held in such spaced relationship by the brace means, and a plurality of cross ribs pivotally connected between the side ribs of the side rib assemblies at each side of the boat and adapted to extend across the boat, said cross ribs having outer ends pivoted to the side ribs and having inner ends pivoted together and automatically operable locking means carried by the inner ends for locking the cross ribs in extended positions.

2. A canopy frame comprising a pair of mounting means adapted to be fixed on a supporting means and disposed in transversely spaced, longitudinally aligned relation, a main side rib adapted to extend longitudinally from each mounting means and having an upwardly curved end pivoted to the mounting means, at least one other side rib pivoted at its lower end to each mounting means and to the curved end, at least two additional side ribs pivoted at their lower ends to the curved end above the pivot point for the curved end, said side ribs on each mounting means constituting a side rib assembly and said ribs of each assembly being movable from collapsed substantially horizontal positions to raised spread apart positions and cross ribs extending between the side ribs of each side assembly and having outer ends pivoted to the side ribs and inner ends pivoted together, automatically operable locking means carried by the inner ends to lock them in substantially horizontal positions and brace means connected to the side ribs for locking them in extended positions.

3. In a canopy frame assembly, a pair of spaced apart side rib assemblies each including a plurality of side ribs, cross ribs extending between the side rib assemblies and each cross rib including a section pivoted at its outer end to one of the side ribs, said sections having inner adjoining ends pivoted together, the inner end of one section being formed on its underside and on its upperside and adjacent the pivot point with a notch, an angular pawl pivoted intermediate its ends to the inner end of the other section, said pawl having a free end adapted to enter the notches and selectively lock the sections in substantially aligned relation and in collapsed parallel relation and spring means connected between the other section and the pawl for urging the free end of the pawl into the notches when the sections are moved into substantial alignment, and when they are collapsed into side by side parallel relation.

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