ENCLOSABLE RETRACTABLE AWNING

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References Cited
UNITED STATES PATENTS
3,364,973 1/1968 Railson ........................... 160/22
3,782,443 1/1974 Clauss et al...................... 160/68
3,833,011 9/1974 Duffy ................................ 135/7.1 A
3,834,400 9/1974 Sattler .......................... 135/5 AT
3,847,171 11/1974 Akers et al. .................. 135/5 AT

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ABSTRACT

A retractable awning assembly includes a closable housing adapted to be mounted upon a recreational vehicle, building structure or the like and a flexible sheet of awning material having an inner edge mounted within the housing and an outer edge secured to a roll bar adapted to be moved from a storage position within the housing to an extended use position wherein the sheet of awning material is extended between the roll bar and the housing. The roll bar is maintained in its use position by a pair of main brace members each having one end pivotally connected to the housing and the opposite end releasably connected to one end of the roll bar, and a pair of secondary brace members, each having one end pivotally connected to an end of the roll bar and the opposite end releasably connected to a side wall of the recreational vehicle, building structure or the like. The main brace members and secondary brace members are foldable into the housing along with the sheet of awning material which is rolled about the roll bar.

14 Claims, 14 Drawing Figures
ENCLOSABLE RETRACTABLE AWNING

BACKGROUND OF THE INVENTION

The present invention relates generally to retractable awnings and more particularly to a retractable awning in which all the working parts of the awning can be folded into a housing to be protected from environmental elements.

Retractable awnings have been desirable items both for building structures and recreational vehicles to provide shade and protection from sun, rain and the like. Typically, the awnings are mounted upon a vertical surface and include supporting bracket members on the vertical surface, braces and a bar upon which the fabric awning sheet can be wrapped to store the awning in its retracted position adjacent the vertical surface. In the early developmental stages of this type of retractable awning, it was found that the innermost portion of the fabric awning material, which was exposed to the ambient environment when the awning was rolled up, would fade and define an undesired stripe across the awning in contrast against the portions of the fabric material which were wrapped inside the exposed portion.

To alleviate this problem, flexible metallic sheets or other fade resistant materials were secured along the inner edge of the fabric material so as to encompass the fabric material when it was rolled up in its storage condition. More recently, awnings have been designed so as to fold into a closable housing mounted on the recreational vehicle, building structure or the like, so that the working components of the awning can be completely enclosed within the housing for protection when not in use. An awning of this type is disclosed in U.S. Pat. No. 3,833,011 of Donald D. Duffy.

OBJECTS OF THE INVENTION

It is an object of the present invention to provide a new and improved retractable awning of the type adapted to be enclosed in a housing member when retracted.

It is another object of the present invention to provide a retractable awning which is quickly and easily moved between conditions wherein it is extended for use and retracted into a protectable housing enclosure.

It is another object of the present invention to provide a retractable awning adapted to be moved between an extended use position and a folded retracted storage position within a housing and wherein the awning includes brace members which are pivotally connected to the housing and to the roll bar so as to be conveniently foldable into the housing.

It is another object of the present invention to provide a retractable awning of the type which is movable between an extended use position and a retracted storage position within an outer housing wherein the bracing means for retaining the awning in the extended position can be used to facilitate movement by one person of a roll bar anchoring the outer edge of a fabric awning sheet between the folded and extended positions.

SUMMARY OF THE INVENTION

The retractable awning of the present invention is of the type wherein the component working parts of the awning can be folded into a box type enclosure mountable upon a recreational vehicle, building structure or the like to conceal the working components of the awning and protect them from the ambient environment.

Further, the awning has been designed so that it is quickly and easily moved between its retracted storage position within the housing and an extended use position wherein it is firmly and securely retained by a uniquely designed bracing system.

More particularly, the retractable awning of the present invention includes a box type housing having an outer face which is movable between closed and open positions to allow the working components of the awning to be quickly and easily removed from or positioned within the housing. The awning includes a flexible sheet of awning material having an inner edge secured within the housing and an outer edge anchored to a spring biased roll bar around which the fabric material is wrapped when the awning is stored in the housing. When the roll bar is positioned in its use position, wherein it is spaced from the housing so that the fabric material is extended between the housing and the roll bar, it is firmly retained by a pair of main brace members having their inner ends pivotally mounted within the housing and their outer ends releasably connected to one end of the roll bar and a pair of secondary brace members having their outer ends pivotally connected to the outer ends of the roll bar and their inner ends releasably connected to a generally vertical surface on the recreational vehicle, building structure or the like. The main brace members as well as the secondary brace members are longitudinally extensible so that the awning can be extended and positively retained in different positions. Due to the unique design of the awning structure, the secondary brace members can remain attached while the awning is rolled into its storage position to facilitate manipulation of the awning by a single person.

Other objects, advantages and capabilities of the present invention will become more apparent as the description proceeds taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a fragmentary perspective view of a portion of a recreational vehicle showing the awning of the present invention secured thereto in a retracted storage position.

FIG. 2 is a fragmentary perspective view of the vehicle of FIG. 1 with the awning of the present invention shown in an extended use position.

FIG. 3 is a section taken along line 3—3 of FIG. 2.

FIG. 4 is a section taken along line 4—4 of FIG. 2.

FIG. 5 is a section taken along line 5—5 of FIG. 2.

FIG. 6 is a section taken along line 6—6 of FIG. 2.

FIG. 7 is a section taken along line 7—7 of FIG. 6.

FIG. 8 is a section taken along line 8—8 of FIG. 4.

FIG. 9 is a section taken along line 9—9 of FIG. 2.

FIG. 10 is a section taken along line 10—10 of FIG. 2.

FIG. 11 is a fragmentary perspective view illustrating the torsion bar biasing means for the closure plate of the housing of the awning.

FIG. 12 is a vertical section with parts removed of the awning structure in its retracted position within the housing.

FIG. 13 is a section taken along line 13—13 of FIG. 12.

FIG. 14 is a section taken along line 14—14 of FIG. 12.
DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring first to FIG. 2, the awning assembly 20 of the present invention is shown mounted upon the side wall 22 of a recreational vehicle 24 and includes a housing 26, an awning sheet 20 of generally rectangular configuration, a roll bar 30 secured to the outer edge of the awning sheet, a pair of main brace members 32 and a pair of secondary brace members 34. As will be appreciated from the following description, the awning sheet 28, roll bar 30 and brace members 32 and 34, which will be referred to as operating components of the awning assembly, cooperate in providing a sturdy extended awning as shown in FIG. 2 which can be retracted and folded into the housing as shown in FIG. 1.

The housing 26 as best seen in FIGS. 1, 2 and 12-14, includes a body portion 36 of generally L-shaped cross-section having a back wall 38 securable to side wall 22 of the vehicle and a bottom wall 40 which could be securable to a horizontal surface if it were desirable to mount the awning assembly 20 upon a horizontal surface such as the top wall of a recreational vehicle. End walls 42 are anchored to opposite ends of the back wall 38 and bottom wall 40. A closure panel 44 having a top plate 46 and a front plate 48 is hingedly attached to the back wall 38 along the top edge of the back wall so as to be swingable between an open position, as shown in FIG. 2, and a closed position, as shown in FIG. 1. As is best seen in FIGS. 13 and 14, the front plate 48 of the closure panel has longitudinally extending channels therein so that the panel conforms generally to the operating component parts of the assembly when they are folded into the housing. The closure panel is biased to its open position by a torsion rod 50 which is shown in FIGS. 11 and 12. The torsion rod is of circular transverse cross section and extends along the length of the housing. Each end of the rod has an attachment portion 52a and 52b extending perpendicularly to the length of the rod. The attachment portion 52a at one end of the rod is anchored to a bracket 54 mounted on one end wall 42 of the housing 26 and the attachment portion 52b of the rod at the opposite end is mounted in a bracket 56 attached to the top plate 46 of the closure panel. As mentioned above, the closure panel is biased into its open position so that the attachment portions 52a and 52b at the ends of the rod do not normally extend in parallel relationship even though both are perpendicular to the length of the rod. The attachment portion 52a which is connected to the end plate extends in a generally horizontal direction while the attachment portion 52b at the end connected to the top plate forms approximately a 45° angle with horizontal when the rod is not under a torsional strain. However, when the closure panel is moved to its closed position, the attachment portion 52b which is connected to the closure panel is moved through an angle so that it lies substantially parallel to the attachment portion 52a at the opposite end thereby placing the bar under a torsional strain which biases the panel to its open position.

The awning sheet 28, which may be made of any suitable material, such as vinyl, has a closed loop 58 formed along its inner edge. The closed loop is received in an elongated notch 60 formed in a bracket 62 integrally connected to the back plate 38 of the housing 26 and an elongated rod 64 is inserted into the closed loop within the notch 60 to positively secure the inner edge of the awning sheet to the housing. The outer edge of the awning sheet is similarly provided with a closed loop 66 and is anchored to the roll bar 30 in a similar manner as will be described later.

The roll bar 30, as best seen in FIGS. 2, 3 and 4, includes a hollow generally cylindrical body portion 68 and a pair of circular end caps 70 having circumferential flanges 72 adapted to slide over the respective ends of the body portion and be secured thereon in any suitable manner. The body portion 68 has four parallel, equally spaced open notches 74 provided therein which extend along the length of the bar. Each notch is of generally circular transverse cross-section and opens through the outer surface of the body through a passage 76 which is smaller than the diameter of the notch. The closed loop 66 along the outer edge of the awning sheet 28 is inserted into one of the elongated notches and a retention rod 78 is inserted through the closed loop within the notch in the roll bar to secure the outer edge of the awning sheet to the roll bar In the disclosed awning, a decorative valance 80 or the like, also made of a sheet of fabric material has an edge with a closed loop 82 that is anchored in another of the elongated notches 74 by a retention rod 84. It will be appreciated, that with the plurality of open elongated notches in the roll bar, decorative valances or the like could be suspended from each notch if desired.

Referring to FIG. 4, a plate member 86 conforming to the interior configuration of the roll bar 30 is positioned in a perpendicular relationship to the longitudinal axis of the roll bar near each end of the roll bar at a slight spacing therefrom. Each of these plates has a collar 88 secured thereto so as to be concentric with the longitudinal axis of the roll bar and protrude toward the adjacent end of the roll bar. This collar rotatably supports the inner end of a connector rod 90 which is used at each end of the roll bar to pivotally support a secondary brace member 34. The connector rods 90 are generally L-shaped in configuration and of circular cross-section with one leg 92a of the connector rod extending along the longitudinal axis of the roll bar so that its inner end is supported in a circular centrally located opening 94 in an end cap 70. This leg 92a of the connector rod 90 extends axially away from the end of the roll bar 30 for a short distance and has a rubber grommet 96 tightly mounted thereon and retained adjacent to the outer surface of the end cap by a washer 98 and a plurality of circumferentially spaced crimped ears 100 in the connector rod 90. The rubber grommet 96 is adapted to releasably receive the outer end of the main brace member 32 as will be described later. A second collar 102 is concentrically mounted upon the leg of the connector rod 92a at a location immediately inside of the end cap 70 and is connected to the connector bar by a radially extending roll pin 104 for unitary movement with the connector bar. The collar 88 has a body portion 102a through which the roll pin extends and a reduced diameter portion 102b protruding toward the plate member 86.

A coil spring 105 having an inner diameter slightly less than the diameter of the collar 88 and the reduced diameter portion 102b of the collar 102 is stretched onto and tightly received in a concentric manner at opposite ends upon each collar. It will be appreciated that since the connector rod 90 is rotatably received within the end of the roll bar 30, the roll bar can be rotated about the connector rod as the awning is being ex-
tended or retracted and the coil spring 104 is mounted so that upon extension of the roll bar away from the housing the coil spring is torsioned thereby causing it to grip the collars more and more tightly, so that it does not slip. When the roll bar is in the fully extended position of FIG. 2, the coil spring at each end of the roll bar is fully torsioned biasing the roll bar in a counter-clockwise direction as viewed in FIGS. 2 or 3 so as to urge the roll bar toward the housing as it wraps the awning sheet 28 therearound.

The main brace members 32 include an extension or support portion 106 pivotedly mounted within the housing for movement about a vertical axis and a pair of telescoping sections 108a and 108b the innermost one 108a of which is pivotally mounted to the distal end of the extension portion 106 for pivotal movement about a horizontal axis. The telescoping sections 108a and 108b are seen best in FIGS. 2 and 5 to be of square transverse cross section with the innermost section 108a having larger side dimensions than the outermost section 108b. A set screw 110 is threadably received in a nut 112 anchored in the side wall of the larger innermost section 108a so that the inner end of the screw can be advanced against the smaller section 108b to press the smaller section against the inner wall of the larger section to positively fix the longitudinal relationship of the telescoping sections.

The outer end of the outermost section 108a has a connector head 114 inserted therein which is anchored in place by crimping the outermost section into the surface of the connector head. The connector head 114 has a generally U-shaped notch 116 formed in its outer end at an angle to the longitudinal axis of the telescoping sections 108a and 108b and adapted to receive the rubber grommet 96 which is mounted upon the connector rod 90 when the main brace is in the extended position.

The secondary brace members 34 also consist of telescoping sections 118a and 118b of square transverse crosssection with the innermost section 118a being releasably connected to a bracket 120 mounted on the side wall 24 of the recreational vehicle and the outermost section pivotally connected to the connector rod 90. The telescoping sections of the secondary brace members can be positively positioned in any longitudinal relationship with a set screw 122 of the type described in connection with the main brace members. Looking first at the outer end of the outermost section 118b of the secondary brace members, it will be appreciated, FIG. 9, that a plug 124 is inserted therein with the plug having two legs 125 extending along opposite sides of the outermost section along the inner surfaces of those sides. The second or outer leg 92b of the connector rod extends perpendicularly to first leg 92a since the connector rod 90 is of generally L-shaped configuration and the second leg extends into the side of the outermost section 118b so as to be rotatably received within a slot 127a provided in one side wall of the outermost section 118b and openings 127b and 127c respectively in opposing legs of the plug. A threaded opening 128 is preferably provided in the end of the second leg to receive a bolt member 129 which anchors the end of the second leg to the outermost section. A roll pin 130 may also be inserted radially through the connector bar within the interior of the outermost section as a precautionary measure to prevent the second leg of the connector rod from being pulled out of the outermost section 118b. As will be appreciated, the secondary brace members 118a and 118b are thereby swingable about the connector rods 90 between a position in which they extend parallel to the roll bar 30, as when the assembly is in the retracted storage condition, and a position wherein they extend generally perpendicularly to the roll bar when the awning 20 is in the extended condition of FIG. 2. The inner end of the innermost section 118b of the secondary brace members, as best seen in FIGS. 6 and 7 has a pin member 132 protruding therethrough to positively secure the end of the innermost section to the bracket 120 on the recreational vehicle. The bracket has a pair of mounting flanges 134 adapted to be secured to the recreational vehicle by screws 136 or the like, and an outwardly projecting head 138 having a transversely extending notch 140 therein which is of generally circular configuration and opens through a passage 142 in the head that is smaller than the diameter of the notch.

Referring to FIG. 6, the pin member 132 has a shaft 144 including an enlarged head 146 on one end adapted to abut the outer surface of the innermost section 118a, an intermediate body portion 148 of reduced diameter relative to the head and a small diameter portion 150 connected to the intermediate portion by a beveled flange 152. The intermediate portion 148 of the pin is received in an opening 154 in one side of the innermost section of the telescoping member and the small diameter portion 150 is received in an opening 156 on the opposite side of the innermost section. A cap 158 is threaded onto the outer end of the small diameter section and serves as an abutment for a compression spring 160 which is concentrically mounted upon the small diameter portion of the pin between the outer wall of the innermost section and the cap. The intermediate portion of the pin has a diameter which is approximately equal to but slightly smaller than the diameter of the notch 140 in the bracket 120 so as to be aldible axially thereinto while the small diameter portion of the pin is of a diameter which will slide laterally through the passage 142 in the head portion of the bracket. The pin 132 of course is adapted to secure the innermost end of the secondary brace member to the bracket 120. To operate the pin, the cap 158 is depressed against the bias of the coil spring 160 so that the small diameter portion of the pin can be aligned with the passage 142 in the bracket and the small diameter portion of the pin is then pushed laterally through the passage into the notch 140 within the bracket. The cap is then released so that the spring pushes the pin in an axial direction pulling the intermediate portion of the pin into the notch and since the intermediate portion of the pin is larger than the passage of the bracket it cannot be removed therefrom without again depressing the cap against the bias of the spring. In this manner, the innermost ends of the secondary brace members are positively but releasably connected to the recreational vehicle at a position below the housing member so that the roll bar is positively positioned at a vertical location which is intermediate the housing and the bracket 120 where the secondary members are mounted.

A pair of brackets 162 are mounted within the housing 26 at opposite ends thereof to support the working components of the awning when in the retracted storage position. The brackets 162 are shown in FIG. 13 to
include upper and lower horizontal legs 164 and 166
respectively each having a flange 168 at its rearward-
most end adapted to be anchored to the rear wall 38 of
the housing as by attachment bolts 170 and a vertical
leg 172 connecting an intermediate portion of the
lower horizontal leg to the outer end of the upper hori-
zontal leg. At the juncture of the vertical leg to the upper horizontal leg, an upwardly and forwardly pro-
jecting ear 176 therein which opens upwardly and
forwardly and is adapted to releasably receive and seat
the rubber grommet 96 mounted upon the connector rod 90. Accordingly, as seen in FIG. 13, when the rub-
er grommets are seated within the U-shaped notches
176, the roll bar is retained in an elevated position
within the housing at an intermediate location be-
 tween the top and bottom walls of the housing. As was men-
tioned previously, the inner end of the extension por-
tion 166 of the main brace members 32 is pivotally con-
ected within the housing and as seen in FIGS. 12 and
13, this pivotal connection is a bolt 178 which passes
ter vertically through the extension member and the lower
horizontal leg 166 of the bracket with the extension
member being disposed beneath the lower leg of the
brace. Also, as can be appreciated from FIG. 13, the
extension bar on one side of the assembly is mounted
closer to the back wall 38 of the housing than is the ex-
tension bar on the opposite side of the assembly so that
when the main brace members 32 are folded into the
housing, as shown in FIG. 13, they extend in parallel
relationship with each other, one being disposed rear-
wardly of the other. Of course, the extension bar which is
mounted closer to the front of the housing is shorter
than the extension bar which is nearer the back of the
housing so that the outer ends of the extension bars
when in the extended position of FIG. 2, will be identi-
cally spaced from the housing. The forward end of the
lower horizontal leg 166 of the bracket passes through a
downwardly opening V-shaped curve 180 and has a
This lock fastener 182 mounted on the forward face
thereof adapted to be received in an associated opening
within the frame 48 of the closure panel 44 of the hous-
ing. Accordingly, to secure the closure panel in the
closed position of FIG. 13, the twist lock fastener 182
is inserted into the opening into the front wall of the
closure panel 44 and twisted to releasably lock the clo-
sure panel to the bracket 162.

To fold the awning from the extended position of
FIG. 2 to the retracted position of FIGS. 1, 12 and 13,
the main brace members 32 are first released from their
connection to the roll bar 30 by releasing the set screws
110 and telescopically sliding the outermost section 108b into the innermost section 108a and subsequently
swinging the main brace members about their pivotal
collection to the bracket 162 in to the housing so that
they lie in parallel relationship to each other and adja-
cent to the bottom wall of the housing as shown in FIG.
13. Next, the roll bar is moved inwardly while pivoting
about the connections of the secondary brace members
34 to the brackets 120. When the roll bar reaches the
housing the rubber grommets 96 on the opposite ends thereof are seated in the U-shaped notches 176 in the
bracket 162 and the secondary brace members are re-
leased from the brackets 120, then shortened by sliding
the smallest telescoping member into the larger role
swinging the telescoping members about their pivotal
collection to the connecting bar 90 until they lie in
parallel relationship with the roll bar. One of the sec-

The retractable awning assembly adapted to extend
outwardly from a generally vertical surface comprising
in combination:

- a housing adapted to be mounted adjacent to said
generally vertical surface,
- a flexible awning sheet having an inner edge mounted
in said housing,
- a roll bar movable from a position within the housing
to a position spaced from the generally vertical sur-
face, means securing an outer edge of said awning
sheet to the roll bar so that the sheet can be wrapped
around the roll bar when the bar is positioned
within the housing and extended between the
housing and the roll bar when the roll bar is posi-
tioned at the position spaced from the generally
vertical surface,
- a pair of main brace members each having an inner
end anchored to said housing and an outer end relea-
sibly connectable to an end of said roll bar to
selectively retain the roll bar in a position spaced
from the generally vertical surface, said main brace
members being swingable into the housing for stor-
age purposes, and
- a pair of secondary brace members each having an
outer end operably connected to one end of the
roll bar and an inner end releasably connectable to said
generally vertical surface at a location below said
housing, said secondary brace members being
swingable into said housing when the roll bar is posi-
tioned therein.

2. The retractable awning of claim 1 wherein each of
said main brace members and said secondary brace
members are longitudinally extensible.

3. The retractable awning of claim 1 wherein said
secondary brace members are pivotally connected to
connection means protruding outwardly from opposite
ends of said roll bar.

4. The retractable awning of claim 3 wherein said
connection means have a portion extending perpen-
dicularly to the length of said roll bar and said secondary
brace members are pivotal about said perpendicular
portion.

5. The retractable awning of claim 1 wherein said
main brace members include a support portion and an
extensible portion with the support portion being pivot-
ally connected to the housing for movement in a hori-
9 horizontal plane and the main body portion being pivotally connected to the support portion for movement in a vertical plane.

6. The retractable awning of claim 1 further including a pair of bracket members mounted in said housing, said bracket members being adapted to retain and support said roll bar within the housing.

7. The retractable awning of claim 6 wherein said brackets further include means for pivotally mounting the inner ends of said main brace members.

8. The retractable awning of claim 1 wherein said housing has a closure panel pivotally connected to a body portion so as to be movable in an upward direction to open a side of the housing to allow the component parts of the awning to be moved into and out of the housing.

9. The retractable awning of claim 8 further including biasing means for biasing said closure panel into its upper open condition and securement means for holding said closure panel in its lower closed position.

10. The retractable awning of claim 1 further including torsion spring means operably mounted in said roll bar so as to be tensioned as the roll bar is rotated about its longitudinal axis when moved from the housing to its position spaced from the generally vertical surface.

11. The retractable awning of claim 10 wherein said torsion spring means includes two coil springs, one being mounted at each end of the roll bar.

12. The retractable awning of claim 11 wherein said secondary brace members are pivotally mounted at opposite ends of the roll bar to connecting rods which extend from a location interiorly of the roll bar to a location exteriorly of the roll bar and wherein said coil springs are mounted upon and concentric with the connecting rods.

13. The retractable awning of claim 12 further including collar means on the interior portion of said connecting rods, said collar means annularly seating opposite ends of said coil springs whereby torsioning of said coil springs will cause the springs to grip the collars and rotatably bias the roll bar as the roll bar is rolled away from the generally vertical surface.

14. A retractable awning assembly adapted to extend outwardly from a generally vertical surface comprising in combination:

a housing adapted to be mounted adjacent to said generally vertical surface,
a flexible awning sheet having an inner edge mounted in said housing,
a roll bar movably from a position within the housing to a position spaced from the generally vertical surface, means securing an outer edge of the awning sheet to the roll bar so that the sheet can be wrapped around the roll bar when the bar is positioned within the housing and extended between the housing and the roll bar when the roll bar is positioned at a spaced location from the generally vertical surface, and

a first pair of brace members, means interconnecting said housing and said roll bar and swingably mounting said first pair of brace members for pivotal movement into said housing regardless of the position of said roll bar, and,
a second pair of brace members adapted to interconnect said roll bar and said generally vertical surface at a location which is spaced beneath said housing and means swingably mounting said second pair of brace members with said roll bar for pivotal movement into parallel relationship with said roll bar while said roll bar is positioned at a location spaced from the generally vertical surface so that both said second pair of brace members and roll bar can be moved as a unit into said housing.

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