Dec. 25, 1951 S. B. ATWOOD 2,579,780

FOLDABLE AWNING FRAME

Filed May 8, 1947

Fig. 1

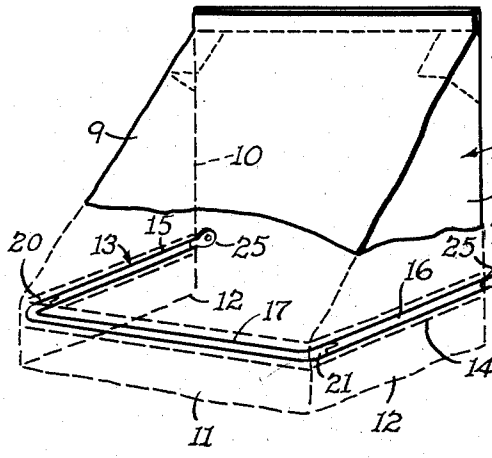


Fig. 3

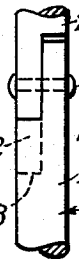


Fig. 2

Fig. 4

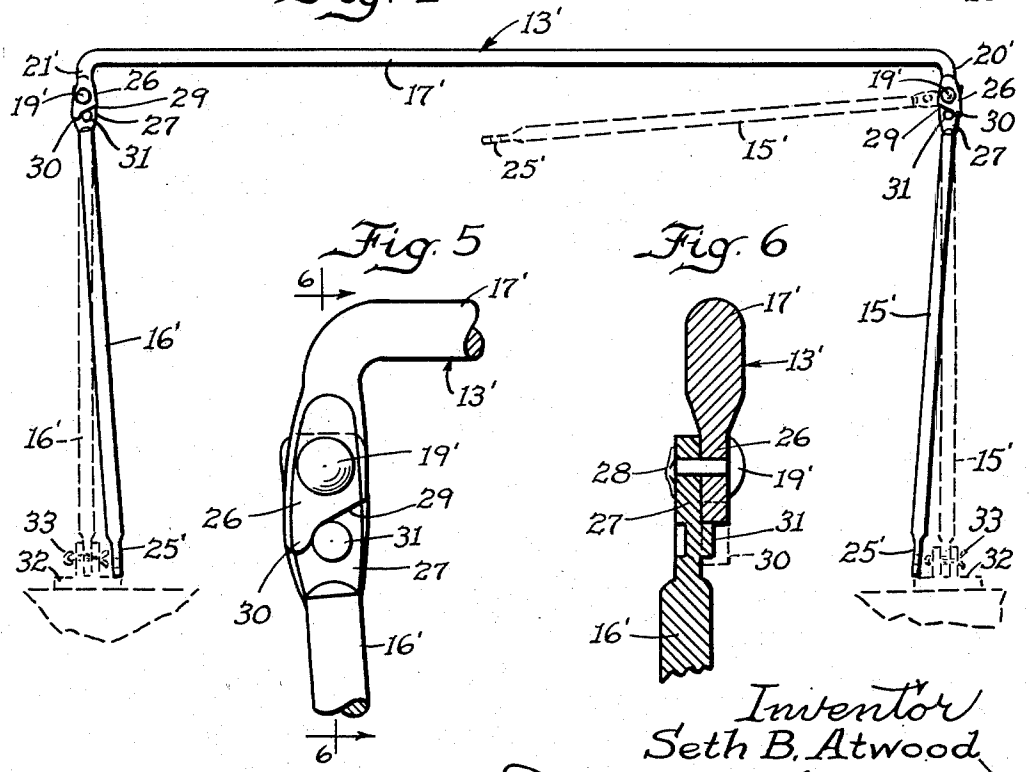


Fig. 5

Fig. 6

Inventor
Seth B. Atwood
Andrew F. Nintercorn
Atty

Patented Dec. 25, 1951

2,579,780

UNITED STATES PATENT OFFICE

2,579,780

FOLDABLE AWNING FRAME

Seth B. Atwood, Rockford, Ill., assignor to The Atwood Vacuum Machine Company, Rockford, Ill., a copartnership composed of Seth B. Atwood and James T. Atwood

Application May 8, 1947, Serial No. 746,754

9 Claims. (Cl. 160—58)

1

This application is a continuation in part of my copending application, Serial No. 631,538, filed November 29, 1945, now abandoned.

This invention relates to a new and improved foldable awning frame.

Awning frames have heretofore usually been of rigid construction, being either bent from rod material to U-form or built up to that form with pipes and elbow fittings. In either case, the shipment of such frames presented quite a problem, the one-piece bent frames being extremely awkward to handle and the knockdown frames made from pipes and pipe fittings being awkward to handle in the knocked-down condition because of the number of loose parts. Furthermore, such frames necessarily had to be shipped in disassembled relation to the awnings, thus present a further problem in the shipment of awnings having frames constructed this old way. The purchaser also had plenty of difficulty with these non-folding frames because they could not be stored away in the basement or attic conveniently, and it was necessary to remove the frames from the awnings at the time the awnings were taken down, because the frames could not be handled conveniently with the awnings left thereon and could not be stored away in such condition handily. As a result, there was considerable wear and tear on the awnings attributable solely to this necessity for removing and later replacing the frames in the hem or tunnel portions provided therefor on the apron portion of the awnings. Awnings subjected to repeated wetting and drying in use are not in a good condition to stand such abuse, and the stitching as well as the canvas is easily torn in inserting or removing the frame.

It is, therefore, the principal object of my invention to provide an awning frame in which the two arms of the U are pivoted on vertical axes on the rearwardly bent ends of the front cross-piece so that these arms may be folded inwardly toward one another and the frame need never be removed from the awning after it has been assembled therein at the factory, and the awning with the frame assembled therein can be assembled and rolled up into a compact bundle for easy shipment as an assembled unit, and the customer is relieved of the necessity of doing any assembling or disassembling when he puts up the awning or takes it down, and he has the same convenience of being able to roll the folded up awning into a compact bundle when he is ready to store the awning in the basement or attic through the winter, an awning having

2

a foldable frame made in this way being much less apt to be torn in putting up or taking down, inasmuch as there is no occasion for removal and replacement of the frame, as heretofore. Wear and tear on the awning is further reduced to a minimum because the hinge joints for the foldable arms are on the ends of the arcuate rearwardly bent ends of the front cross-piece, so that the frame presents nicely rounded corners at the ends of the cross-piece which will not be apt to scuff the canvas and wear holes therein.

The awning frame is preferably provided with stops limiting the pivotal movement of the arms to nearly 90° inwardly toward each other so that when the arms are swung outwardly toward operative positions, they are in rigid relation to the cross-piece, and the frame is accordingly assured of the desired degree of stability, not being free to sway laterally in either direction under wind pressure against the awning.

The frame is furthermore preferably formed from three pieces of round rod material, the ends of which are swedged to flattened form to provide the hinging and attaching portions for a strong, durable and economical construction, and one which also permits of economically providing stop projections on the rear edges of the rearwardly bent and flattened end portions of the crosspiece and cooperating extruded pin-like projections on the flattened front end portions of the foldable arms to limit the pivotal movement of said arms by engagement of said projections, the projections being preferably so located that the arms converge rearwardly upon interengagement of said projections and have to be sprung apart to bring them into substantial parallelism, whereby to insure a certain amount of spring tension between the frame and the attaching brackets on the wall and avoid likelihood of the awning frame rattling under wind pressure.

The invention is illustrated in the accompanying drawing, in which—

Fig. 1 is a perspective view of an awning unfolded for use and equipped with a foldable frame made in accordance with my invention, the lower portion of the awning being shown in dotted lines so as to permit showing the frame in full lines;

Fig. 2 is a plan view of the frame on a larger scale with intermediate portions broken away to conserve space and permit showing the frame on such a large scale;

Fig. 3 is a side view of one portion of Fig. 2, taken on the line 3—3 thereof;

Fig. 4 is a plan view of another frame of generally similar construction in which the parts have swedged hinging and attaching end portions, the hinging portions being formed with stop projections so that the arms of the frame when swung outwardly toward operative position are disposed in rearwardly converging relation, as shown in full lines, and have to be sprung apart toward substantial parallelism as indicated in dotted lines;

Fig. 5 is a plan view of a portion of the frame of Fig. 4 shown on a larger scale, and

Fig. 6 is a cross-section on the line 6—6 of Fig. 5.

Similar reference numerals are applied to corresponding parts throughout these views.

The awning 8 comprises the usual top portion 9 and side portions 10 and the usual apron portions 11 and 12 on the front and sides. The U-shaped awning frame indicated generally by the numeral 13 is entered in a hem or tunnel portion 14 provided in the awning at the top of the apron portion in the usual way. This hem portion is sewed to the rest of the awning, and the frame fits rather loosely in it, but due to the stiffness of the canvas, it is not easy to insert or remove the frame, and when an awning has been out in the weather a whole season and subjected to repeated wetting and drying, the stitches are easily torn, and as a result, it is not at all uncommon to have portions of the hem torn loose from the rest of the awning when the frame is being removed or is being inserted. The canvas also is not as strong after a season's, or two, use of an awning and will become worn at the points where the frame rubs against the canvas, and these worn portions are quite apt to tear in the process of removing or replacing a frame. It is, therefore, obvious that the purchaser will get much better service out of an awning if he can leave the frame assembled in it when he stores it away in the basement or attic. The manufacturer, furthermore, finds it a lot simpler to ship an awning and frame rolled up in a single bundle, the frame being assembled in the awning at the factory instead of being shipped as a separate item. The purchaser when he gets the awning, does not have to figure out the first time how to assemble the frame in the awning, which, to a person not mechanically inclined, might be a problem in itself. The frame 13 of my invention, which is made of formed, substantially round, rod material, has the arms 15 and 16 foldable inwardly toward substantially parallel relation to the cross-piece 17 as indicated in dotted lines in Fig. 2 so that the awning with the frame in it may be folded and then rolled into a fairly compact bundle, which can be shipped conveniently, in contrast to the awkward matter of shipping rigid U-shaped frames separately, or shipping the disassembled parts of a knock-down frame or frames separately. It goes without saying that there is a considerable saving in time and labor all around in the handling of such a single item for shipment as compared with two or more in the completion of a single sale, and the opportunities for parts to be lost or go astray in shipment are, of course, greatly reduced.

The arms 15 and 16 are pivoted as indicated at 18 and 19 to the rearwardly arcuately bent end portions 20 and 21 of the cross-piece 17, the pivot pins 18 and 19 being inserted through registering holes in the overlapping portions of the parts mentioned, which form rabbet joints, as clearly indicated in Fig. 3. The bent portions 20 and 21 are cut off on a 45° angle as indicated at 22 in

Fig. 2 for abutment with 45° shoulders 23 provided on the ends of the arms 15 and 16 whereby to prevent swinging movement of either of these arms 15 and 16 outwardly, but allow inward swinging movement toward one another as indicated by the arcs 24 in Fig. 2. The pivots 18 and 19 are substantially vertical and substantially at right angles to the horizontal pivotal axes *a*—*b* of the rear end portions 25 of the arms 15 and 16 so that the frame is rigid in a horizontal plane despite the pivoting of the arms 15 and 16 relative to the cross-piece 17. The stops 22—23 give the frame lateral stability to prevent side swaying of the awning under wind pressure.

The frame 13' illustrated in Figs. 4 to 6 is of generally similar construction, comprising arms 15' and 16' foldable inwardly toward substantially parallel relation to the front cross-piece 17', as indicated by the dotted position of one of the arms 15' in Fig. 4, that arm, incidentally, being shown only in an intermediate position, inasmuch as both arms 15' and 16' are actually foldable into abutment with the cross-piece 17'. Greater strength is obtained in the frame 13' by swedging the ends of the pieces 15'—17' to provide the flattened hinging end portions 26 on the rearwardly bent end portions 20' and 21' of the cross-piece 17', the flattened hinging portions 27 on the front ends of the arms 15' and 16' being likewise formed by swedging. The swedged portions 26 and 27 are fastened together by pivot pins 19', the projecting ends of which are upset as indicated at 28 in Fig. 6. In swedging the pivotal portions 26, the rear edges 29 which are in rearwardly diverging relation are formed to provide stop projections 30 to cooperate with extruded cylindrical pin-like projections 31 struck from the flattened end portions 27 of the arms 15' and 16'. This swedged and extruded construction permits close accuracy in the location of the interengaging projects 30 and 31 relative to the pivot pins 19' with a low manufacturing cost, and the construction is moreover much stronger and more durable than others. With the close accuracy in location of the stop projections, it is practical and feasible to provide for predetermined angularity of the arms 15' and 16', as shown in full lines in Fig. 4 when the arms are swung outwardly toward operative position. In this figure, it is clear to what extent the arms converge rearwardly and that they have to be sprung outwardly toward substantial parallelism as indicated in dotted lines, in order to enter the flattened rear end portions 25' in the brackets 32 on which the awning frame is pivotally mounted in the usual way as by cotter pins 33. The flattened rear end portions 25', incidentally, are also swedged like the flattened hinging portion 27, but in a plane at right angles thereto. As a result of the springing outwardly of the arms 15' and 16', there is secured the desired spring tension between the frame and the supporting brackets 32 so that there will be no likelihood of the awning frame rattling under wind pressure.

It is believed the foregoing description conveys a good understanding of the objects and advantages of my invention. The appended claims have been drawn to cover all legitimate modifications and adaptations.

I claim:

1. A U-shaped awning frame adapted to be pivotally mounted on a pair of supporting brackets disposed in a predetermined fixed spaced relationship, said frame comprising a front cross-member having rearwardly bent substantially

parallel end portions, and side members adapted to be attached at one end to said supporting brackets and being pivotally connected at the other end to said rearwardly bent end portions on axes substantially at right angles to the plane of the frame, whereby to facilitate folding of said side members into approximate parallelism to the cross-member, and stop means limiting the outward swinging movement of said side members relative to said cross-member when said side members are almost in right angle relation to said cross-member, said frame being resilient and said side members being flexible into substantially parallel relationship to one another for attachment to said supporting brackets, whereby said side members are under spring tension when attached to said brackets.

2. In combination, an awning comprising top and side portions and having a hem portion on the front and side portions adapted to receive a U-frame, a foldable U-frame permanently assembled in said hem portion and comprising a front cross-member formed by a rod having arcuately rearwardly bent end portions, and substantially parallel side members pivotally connected to said end portions on axes substantially at right angles to the plane of the frame, whereby to facilitate folding of said side members into approximate parallelism to the cross-member, said awing and frame assembled therein being rollable into a compact bundle when the frame is folded in the manner stated, a pair of supporting brackets disposed in a fixed spaced relation on which the rear ends of said side members are adapted to be pivoted, and stop means limiting the outward swinging movement of said side members relative to said cross-member when said side members are almost in right angle relation to said cross-member, said frame being resilient and said side members being flexible into substantially parallel relationship to one another for attachment to said supporting brackets, whereby said side members are under spring tension when attached to said brackets.

3. In an awning frame construction, a front cross-member having a rearwardly bent integral end portion, the extremity of said end portion being rabbetted to define a shoulder thereon at an acute angle relative to the cross-member, and a side member foldable relative to the cross-member having an end portion pivoted to said rabbetted end portion on a pivot substantially at right angles to the plane of the frame, whereby to facilitate folding of said side member into approximate parallelism to the cross-member, said side member having a stop projection thereon in radially spaced relation to said pivot and engageable with said shoulder thereby limiting outward pivotal movement of said side member when the same is approximately in right angle relationship to said cross-member.

4. A U-shaped awning frame adapted to be pivotally mounted on a pair of supporting brackets disposed in a predetermined fixed spaced relationship, said frame comprising a front cross-member formed by a rod of substantially round cross-section having arcuately rearwardly bent elongated end portions the extremities of which are rabbetted and define next to the rabbets rearwardly diverging shoulders, the round surfaces on all portions of said cross-member including the bent end portions thereof reducing wear on those portions of the awning coming in contact therewith, and foldable side members having end

portions pivotally connected to the rabbetted end portions of said cross-member by pivots disposed on axes substantially at right angles to the plane of the frame, whereby to facilitate folding of said side members into approximate parallelism to the cross-member, said side members having stop projections thereon in radially spaced relation to said pivots and engageable with said shoulders thereby limiting outward pivotal movement of said side members when said side members are approximately in right angle relationship to said cross-member and substantially parallel to one another.

5. In combination, an awning comprising top and side portions and having a hem portion on the front and side portions adapted to receive a U-frame, and a foldable U-frame permanently assembled in said hem portion and comprising a front cross-member formed by a rod having arcuately rearwardly bent end portions which are rabbetted so as to define rearwardly diverging shoulders, and foldable side members having end portions pivotally connected to the rabbetted end portions of said cross-member by pivots disposed on axes substantially at right angles to the plane of the frame, whereby to facilitate folding of said side members into approximate parallelism to the cross-member, said awning and frame being rollable into a compact bundle when the frame is folded in the manner stated, a pair of supporting brackets disposed in a fixed spaced relation on which the rear ends of said side members are adapted to be pivoted, and stop projections on said side members in radially spaced relation to the pivots pivotally connecting the side members and the rabbetted end portions of said cross-member for limiting the outward swinging movement of said side members relative to said cross-member when said side members are almost parallel and almost in right angle relation to said cross-member, said frame being resilient and said side members being flexible into substantially parallel relationship to one another for attachment to said supporting brackets, whereby said side members are under spring tension when attached to said brackets.

6. An an article of manufacture, a three-piece awning frame made entirely of three pieces of formed rod material, namely, a front cross-piece of round rod material the ends of which are bent rearwardly in arcs of appreciable radius so as to define smooth non-scuffing round corners on the frame as integral portions of and flush with the rest of the cross-piece, the extremities of said rearwardly bent end portions being flattened in a horizontal plane to form hinging portions integral with said cross-piece, and two side pieces of rod material having the front end portions flattened in a horizontal plane to form hinging portions integral with said side pieces pivotally connected on vertical axes to the aforesaid hinging portions of said cross-piece, the rear end portions of said side pieces being flattened in vertical planes to form attaching portions, the flattened extremities of said rearwardly bent end portions of said cross-piece having stop shoulders on their extremities, and the flattened front end portions of said side pieces having stop projections thereon in radially spaced relation to said pivots and engageable with said stop shoulders to limit pivotal movement of said side pieces to approximately 90°.

7. As an article of manufacture, a three-piece awning frame made entirely of three pieces of formed rod material, namely, a front cross-piece

of round rod material the ends of which are bent rearwardly in arcs of appreciable radius so as to define smooth non-scuffing round corners on the frame as integral portions of and flush with the rest of the cross-piece, the extremities of said rearwardly bent end portions being flattened in a horizontal plane to form hinging portions, and two side pieces of rod material having the front end portions flattened in a horizontal plane to form hinging portions pivotally connected on vertical axes to the aforesaid hinging portions of said cross-piece, the rear end portions of said side pieces being flattened in vertical planes to form attaching portions, the extremities of said rearwardly bent end portions being diagonal and in rearwardly diverging relation and having rearwardly extending stop projections on their outer sides, and said side pieces having stop projections thereon in radially spaced relation to said pivots and engageable with the aforesaid stop projections thereby limiting pivotal movement of said side pieces to approximately 90°.

8. As an article of manufacture, a three-piece awning frame made entirely of three pieces of formed rod material, namely, a front cross-piece of round rod material the ends of which are bent rearwardly in arcs of appreciable radius so as to define smooth non-scuffing round corners on the frame as integral portions of and flush with the rest of the cross-piece, the extremities of said rearwardly bent end portions being flattened in a horizontal plane to form hinging portions, and two side pieces of rod material having the front end portions flattened in a horizontal plane to form hinging portions pivotally connected on vertical axes to the aforesaid hinging portions of said cross-piece, the rear end portions of said side pieces being flattened in vertical planes to form attaching portions, the rearwardly bent end portions of said cross-piece being provided with stop shoulders in radially spaced relation to said pivots, and said side pieces having stop projections thereon in radially spaced relation to said pivots to engage said stop shoulders to limit pivotal movement of said side pieces to approximately 90°, the side pieces when swung outwardly to their limit positions being disposed nearly parallel and nearly at right angles to the cross-piece in rearwardly converging relation, said rod material of the three pieces being resilient and flexible to facilitate flexing said side pieces into substantial parallelism.

9. As an article of manufacture, a three-piece awning frame made entirely of three pieces of formed rod material, namely, a front cross-piece of round rod material the ends of which are bent rearwardly in arcs of appreciable radius so as to define smooth non-scuffing round corners on the frame as integral portions of and flush with the rest of the cross-piece, the extremities of said rearwardly bent end portions being flattened in a horizontal plane to form hinging portions, and two side pieces of rod material having the front end portions flattened in a horizontal plane to form hinging portions pivotally connected on vertical axes to the aforesaid hinging portions of said cross-piece, the rear end portions of said side pieces being flattened in vertical planes to form attaching portions, the extremities of said rearwardly bent end portions having rearwardly extending stop projections on their outer sides, and said side pieces having stop projections thereon in radially spaced relation to said pivots arranged to engage the aforesaid stop projections to limit pivotal movement of said side pieces to approximately 90°, the side pieces when swung outwardly to their limit positions being disposed nearly parallel and nearly at right angles to the cross-piece in rearwardly converging relation, said rod material of the three pieces being resilient and flexible to facilitate flexing said side pieces into substantial parallelism.

SETH B. ATWOOD.

REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
109,758	Rice	Nov. 29, 1870
268,968	Willie	Dec. 12, 1882
289,532	Hastings	Dec. 4, 1883
855,579	Knabeschuh	June 4, 1907
1,788,102	Gilbert	Jan. 6, 1931
1,932,945	Wilson	Oct. 31, 1933
2,132,988	Leibo	Oct. 11, 1938
2,301,077	Payton	Nov. 3, 1942