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Clauss et al.

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[54] **ROLL-UP AWNING CONSTRUCTION**

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[52] **U.S. Cl.** **160/22,** 160/68

[51] **Int. Cl.** **E04f 10/06**

[58] **Field of Search** ..... 160/11, 22, 23, 26, 160/29, 68, 70, 79; 16/178; 248/224; 220/9 R, 31 R

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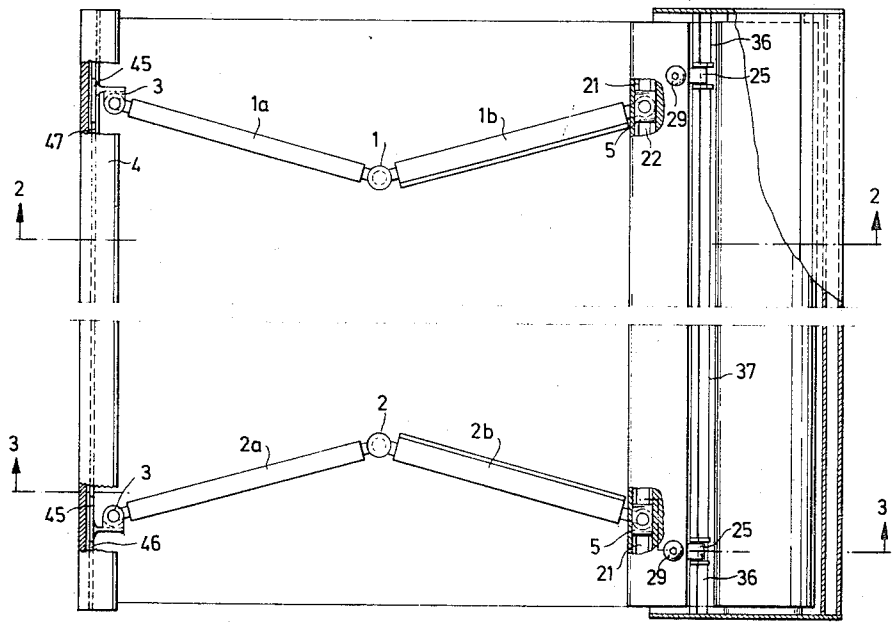
Primary Examiner—Peter M. Caun
Attorney—Robert D. Flynn et al.

[57] **ABSTRACT**

A box-like housing, made of formstable, rigid material such as extruded aluminum has a holder for an awning roll therein, the awning roll terminating in a terminal bar, likewise an extruded aluminum or other lightweight metal member. The terminal bar is connected to the housing by jointed, articulated arms which are secured to the housing itself by bearing members attached to a transverse rail hooked into the housing so that a single box-like structure is provided which can be secured to a support surface, such as a wall, and additional attachments of support arms, and the like, are avoided. Adjustable stops limit the angle of inclination permitted to the bearings for the arms, so that the angle of the projecting awning can be adjusted. The projecting arms are made of interfitting lightweight metal sections, such as a generally U-shaped section into which a trapeze-shaped section fits, the awning housing being formed with a recess against which a brush can bear to clean the awning as it is rolled in or out.

19 Claims, 4 Drawing Figures



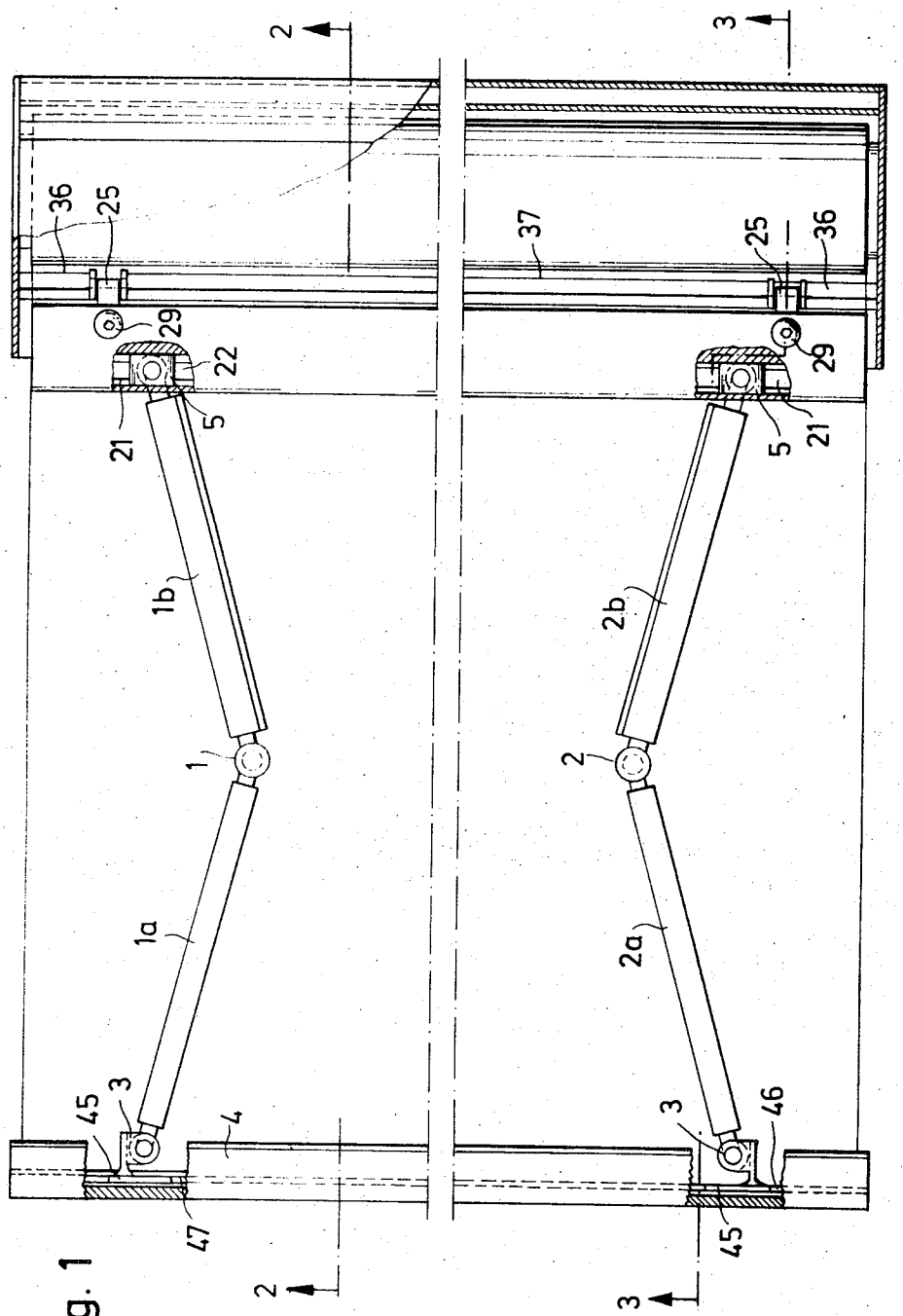


Fig. 1

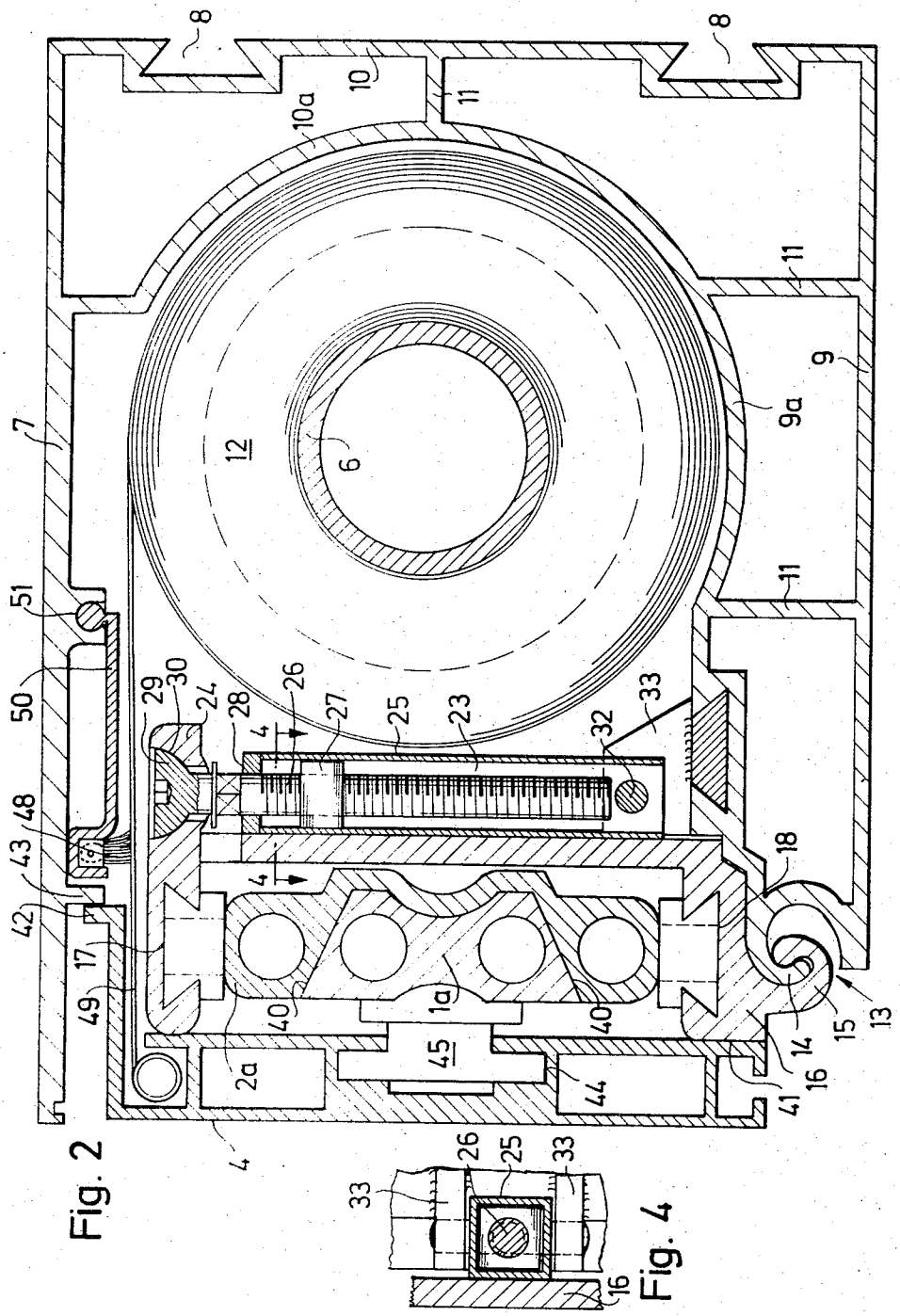

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Fig. 2

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Fig. 4

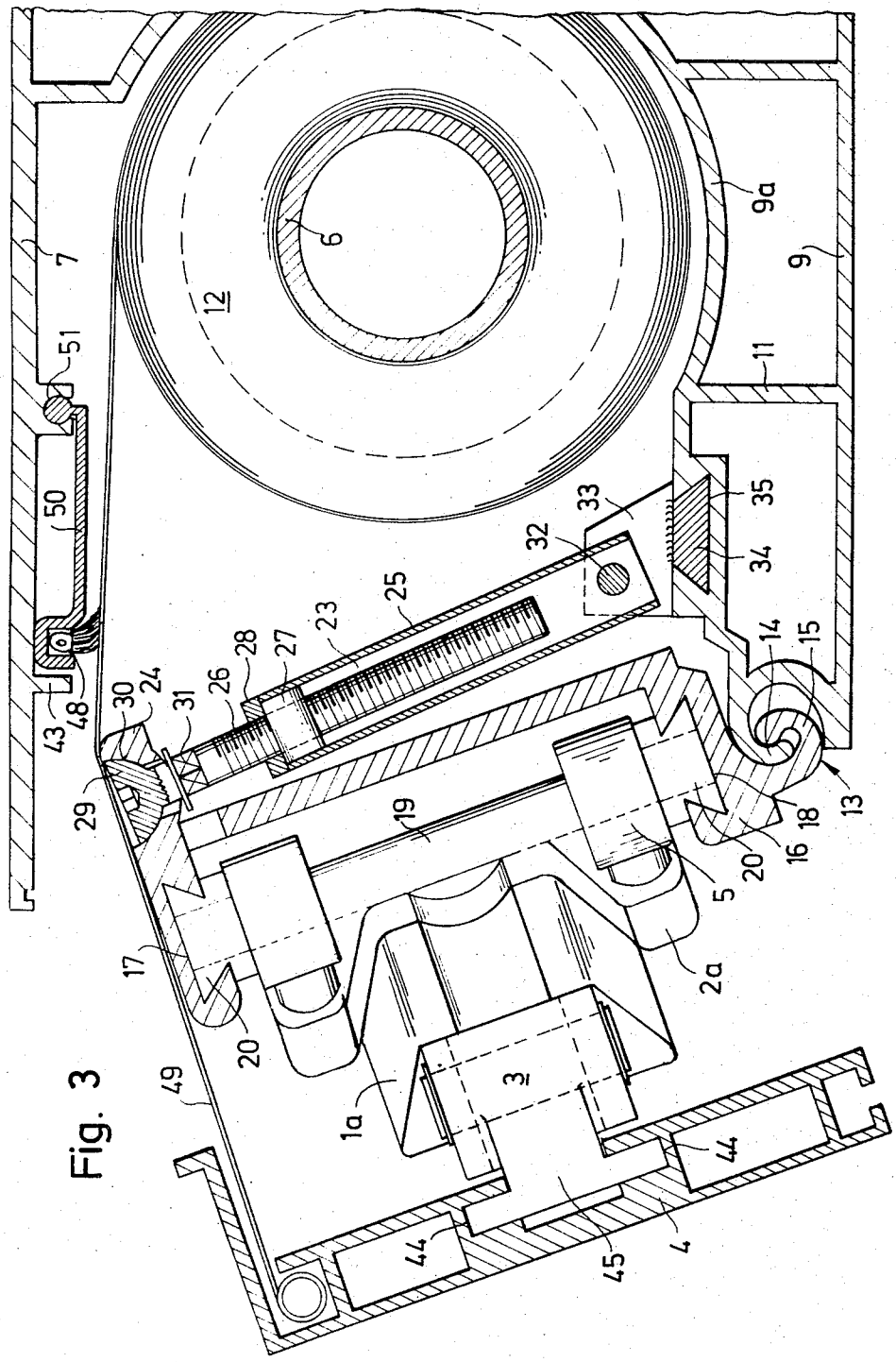
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Fig. 3

ROLL-UP AWNING CONSTRUCTION

The present invention relates to an awning construction, and more particularly to the type of construction in which a rolled cloth, or other material is secured to a terminal bar which, in turn, is connected to articulated, jointed arms which can pivot about a horizontal axis, the awning material itself being located within a box-like housing.

Roll-up awnings of various types are well known. It is customary to form the bearings for the jointed support arms as blocks which are to be secured directly, or indirectly to the wall on which the awning is to be placed. The bearing blocks are occasionally so made that the actual pivot, or joint is pivotable about a horizontal axis, so that the inclination of the awning, when paid out, or rolled out, can be changed. Mounting the bearing blocks on the wall requires considerable skill, and it has been proposed to locate the bearing blocks for the jointed arms on a carrier bar, or carrier bail which, in turn, is secured to the wall in order to compensate for minor inaccuracies of mounting.

The awning material, such as fabric or the like, is usually protected by a longitudinal housing, frequently in the form of a box-like structure, which also improves the appearance of the awning when rolled in. The mechanism for rolling in the awning may likewise be contained within the housing. Mounting of the housing structure for the awning material itself is a separate operational step, separate from the mounting of the bearing blocks. Such a housing as customarily used is made of separate pieces of sheet metal which are interconnected, more or less on a custom-built basis.

It is an object of the present invention to provide an awning construction which utilizes little space when installed, which permits "do-it-yourself" installation and which requires substantially less skill and time in mounting the awning and all associated equipment.

SUBJECT MATTER OF THE PRESENT INVENTION

Briefly, a box-like housing structure is provided made of formstable, rigid material, preferably an aluminum or other light-weight metal extrusion which has a hinge portion at the front end of the bottom wall; a second, matching hinge portion engages the hinge on the bottom wall. The hinge connected to the bottom wall carries the bearings for jointed, articulated arms which are preferably interengaging, matching profiled members of lightweight metal, the bearings being adjustably restrained from swinging over the hinge so that the inclination of the awning can be set. The box-like structure of the awning itself is closed off by a terminal bar to which the housing is attached, which likewise may be a light-weight metal extrusion. The housing is formed with a chamber into which a brush fits which rides against the upper portion of the awning material to clean the awning material as it is paid out or rolled in. The housing structure itself has attachment portions secured therein, preferably in the form of interengaging dovetail-keystone sliding elements, one of which can be secured to a support structure such as a wall of the building, and the housing then slid sideways on the engaging, already secured element, to permit rapid and simple attachment of the housing structure to an existing wall.

In accordance with a preferred embodiment, the bearings for the articulated arms are connected to the hinge portion also by means of dovetailed interconnections to permit sliding the elements laterally together, thus facilitating rapid assembly.

The housing for the awning is a self-supporting, self-contained structural element which contains the bearing portions for the jointed arms, as well as the rolled-up awning itself, and which can likewise contain all necessary bearings and drive arrangements. Such an awning structure is easy to mount since it merely suffices to secure the housing structure at its outer side to the support wall to which it is connected. It is unnecessary to provide separate mounting of bearings blocks for the articulated jointed arms, which mountings have to be coordinated and aligned with each other. When the awning is rolled in, all portions are completely contained within the self-supporting, closed box-like housing structure to permit ready transport, without chance of loss of separate elements, or requiring further packing. If the awning is to be removed as a whole, for example after the summer season, or for cleaning or replacement of awning material, the entire structure can readily be removed from the support wall since it is only necessary to remove the self-contained housing from the wall, the rolled-up awning then being readily removable.

Very long and heavy awnings require housings which are very stable and strong; for such awnings, in accordance with an embodiment of the invention, the bottom and back wall of the box-like structure forming the housing is made as a double-walled structure with stiffening ribs located between the two walls. The inner walls of the housing structure then can be rounded to match, approximately, the outer circumference of the awning when it is rolled up.

The hinge portion itself is preferably formed as a continuous hinge eyelet to which a matching eyelet, secured to a rail extending lengthwise of the housing is secured. The two eyelets are formed as interengaging hooks, one of the hook-like structures being on the housing and the other on the rail which supports the bearings for the articulated arms. Assembly of the rail to the awning is especially simple since it is only necessary to slide the two interengaging hooks formed by the eyelets longitudinally within each other, and variation of the angle of inclination can readily be adjusted up to about 90° deflection.

The jointed, articulated arms preferably include one element which is essentially U-shaped in cross-section, for example having wedge-shaped legs, into which a second jointed arm fits which has a generally trapeze-shaped cross-section, the inclination of the sides of the trapeze matching the inclination of the wedge of the sides of the U-shaped arm. Light-weight, strong and formstable arms are thus provided. One of these arms is connected to the terminal bar of the awning, also preferably an extruded light-weight metal member which may form, at the same time, a closing element for the entire awning structure.

In accordance with another feature of the invention, the housing is formed with a recess into which a brush can fit, which rides above the material of the housing to clean the awning material as it is rolled in and out.

The invention will be described by way of example with reference to the accompanying drawings, wherein:

FIG. 1 is a schematic top view of the awning in rolled-out position, with partly cut-open housing box and parts cut away to show internal construction;

FIG. 2 is a transverse cross-sectional view taken at the position of lines 2—2 of FIG. 1 with the awning however, fully retracted;

FIG. 3 is a transverse cross-sectionsl view taken at the position of lines 3—3 of FIG. 1 with the awning just being extended; and

FIG. 4 is a fragmentary sectional view along lines 4—4 of FIG. 2.

The awning made of material, for example textile fabric **12** (FIGS. **2, 3**) is rolled on a shaft or roller **6,** and secured at its far end to a terminal bar **4** which is connected by means of joints **3** (FIGS. **1, 3**) to a pair of articulated arms **1, 2.** The articulated arms each contain a section **1***a*, **1***b* and **2***a*, **2***b*, respectively, interconnected by a central joint. The arm portions **1***b*, **2***b* are connected by means of bearings **5** to the housing **1,** the arrangement being such that the bearings can pivot about a horizontal azis, as will be explained in detail below.

The shaft **6** for the awning is retained in bearings located in a housing structure **7,** the bearings not being specially shown and well known in the art. Housing structure **7** is made as a single, unitary formstable, self-supporting structural element, preferably a single unit extruded aluminum profile. Other constructions may be used, for example, the housing **7** may be formed of elements which are welded together. The eventual structure of the housing should, however, not be subject to deformation so that a single sefl-supporting, non-deforming unit will result capable of supporting and retaining the awning fabric, and associated parts, and also hold the awning fabric when rolled out. The housing structure is generally box-shaped and has at its outside dovetail grooves **8** which are adapted to receive mounting elements, having matching keystone projections, the mounting elements being adapted to be secured to a wall, or a ceiling of a support structure, such as a building. The dovetail grooves extend longitudinally and thus permit longitudinal sliding of the housing structure **7** so that it is only necessary to secure a sufficient number of dovetailed projections on a wall and then slide the housing structure laterally into the dovetailed projection, lateral adjustment being possible after the box-like structure **7** has been supported on the support wall.

Structure **7** is formed in the region of its bottom and rear walls as a double-wall construction, having an outer bottom wall **9,** an outer rear wall **10,** and inner rear wall **10***a* and bottom wall **9***a*. Stiffening ribs **11** are provided to interconnect the inner and outer wall, the double wall constructions providing for an especially rigid and non-deformable structure. The inner walls **9***a*, **10***a* are curved to match the circumference of the awning material when rolled up.

The forward edge of bottom wall **9** of structure **7** is shaped to form a joint having a horizontal pivoting axis. Structure **7** is formed with an elongated hook-shaped projection **14** forming an eyelet and extending over the length of the structure. A rail **16** having a matching hook-like projection forms the other part of the hinge, the hook projections **14, 15** being hooked within each other, as best seen in FIGS. **2** and **3.** The rail **16,** with the hook-like projections interengaging, can be slid sideways into the housing structure to form a complete unit which cannot be disassembled by pivoting of the rail **16** with respect to the housing. This arrangement thus permits swinging of the rail **16** over an angle of about 90°, that is, into the horizontal position, but without possibility of loss, or removal of the rail **16** from the housing structure **7** itself. Forming the hinge **13** in this manner, provides for particularly simple assembly. Other arrangements may be used, for example standard hinges with a hinge pin.

Rail **16** has a generally U-shaped transverse cross-section; oppositely located legs of the U have facing longitudinal dovetail grooves **17, 18** in which the bearings **5** of jointed arms **1, 2** are secured. The bearings **5** include a bearing bolt **19** which is formed at its end, or has secured thereto keystone-shaped projections **20, 21** matching the dovetail grooves **17, 18.** This construction permits slipping the bearing bolts **5** from the sides into the rail **16** and then correctly aligning the bearing bolts at the desired position with respect to arms **1, 2.** Bearings **5** are located at the desired position of track **16** by means of distance elements **21, 22** (FIG. **1**) slipped into the grooves **17, 18** before the second bearing element is assembled; other attachment means, such as set screws may be used.

The deflection of rail **16** with respect to the box-like housing structure **7,** and thus the angle with which the awning will project from the support wall is determined by a stop arrangement which includes a pair of telescopic assemblies **23,** journalled behind the joint **13** at the bottom wall **9** of the box **7.** The telescopic assembly is secured to the rail **16** at a rearwardly projecting flange **24,** and movable, that is pivotally arranged, with respect thereto. The telescopic assembly **23** includes a threaded bolt **26** located within a sleeve **25.** A nut **27** is screwed on bolt **26,** the nut bearing against an inwardly turned edge **28** of the sleeve **25,** as best seen in FIG. **3.** The head **29** of bolt **26** is formed as a half-ball; the half-ball is seated in a matching depression **30** formed in flange **24,** thus providing for limited pivoting movement. The bolt **26** can be turned by means of an Allen head wrench, or by forming the edge of the bolt with straight sections, for example in form of a hexagon, as seen at **31.** Sleeve **25** is connected by means of a swing bolt **32** with a small block **33** which is anchored over a dovetail groove **35** with the inner wall **9***a* of support structure **7.** The two blocks **33** are located longitudinally within the support housing **7** by distance elements **36, 37** slipped into the dovetail groove **35** (FIG. **1**).

When the awning is rolled out, rail **16** inclines, together with bearings **5** and arms **1, 2.** The axis of inclination is horizontal, formed by the joint **13.** The rail will incline until nut **27** engages the collar **28** on sleeve **25,** to limit the inclination. When the awning is rolled in, the position of the awning will be as indicated in FIG. **2,** with the rail vertical and the terminal bar **4** forming a closing for the box-like structure of the housing. The view of FIG. **3** illustrates the awning partly extended.

The jointed arms **1, 2** should take up as little space as possible when the awning is rolled in. To this end, arms **1, 2** are so constructed that the portions **1***a*, **1***b* and **2***a*, **2***b*, respectively, are interengaging matching profiled elements, which fit within each other when the awning is closed or rolled in. The elements **1***b*, **2***b* contain generally U-shaped members having a pair of legs which are wedge-shaped in cross section, that is,

which open up towards the outside, the wedge-shaped surfaces being seen at **40**. The matching other arm portions *1a*, *2a* have generally trapeze-shaped cross-section, the inclination of the sides of the trapeze fitting against the inclination of the wedge, so that surfaces **40** on the wedge-shaped legs will fit against the inclined sides of the matching surfaces of arm portions *1a*, *2a*. When the awning is rolled in, as seen in FIG. **2**, the terminal bar **4** closes off the entire construction, the bar being formed with a surface **41** fitting against rail **16** and with a flange **42** fitting against an abutment ridge **43** (top of FIG. **2**) of the upper wall of the box-like housing **7**. The terminal bar **4** itself is preferably a hollow aluminum extrusion, formed with a longitudinal groove **44** which is either dovetailed or T-shaped, and in which joint or pivot elements **45** of joints **3** are inserted, fixed in longitudinally aligned position by spacer elements **46, 47** (FIG. **1**), for example, or by set screws or other fastening means.

The inner upper wall of the box-like housing structure **7** including ridge **43**, is shaped to define a chamber in which a brush **48** can be received. Brush **48** is swingably mounted to swing about a horizontal axis, bearing against the upper surface layer **49** of the awning material to sweep the awning material as the swning is rolled in or paid out. Brush **48** is secured to a flange member **50** which has one end pivotally received in a cylindrical bearing groove **51** formed in the housing structure **7**. The brush **48** bears against the material by pivoting about the spherical groove **51**.

The jointed, articulated arms *1a*, *1b*, *2a*, *2b*, respectively, by being constructed of interengaging matching profiled elements permits the awning to be of small dimensions when closed; distortion of one arm portion with respect to the other is avoided by the matching engaging inclined surfaces, permitting complete and accurate closure of the awning housing **7** by the terminal bar **4** at all times, when the awning is rolled in.

Various changes and modifications may be made within the invention concept. Standard elements in the art, such as bevel gears, ratchets, cranks and the like to roll in the awning and paid out, springs and holding elements for the shafts **6** themselves have been omitted, for purposes of clarity, since such elements and components are well known in the art and can be standard. Likewise, support hooks having a keystone-shaped profile to slip into the dovetail grooves **8** have been omitted, the support structure essentially including a plate or rail with holes therethrough to fasten the plate or rail to a housing wall, the side facing the awning being profiled to match the dovetail groove **8**, or having a profile element secured thereto.

We claim:

1. Roll-up awning structure comprising

a box-like housing **7** of formstable rigid light-weight metal material, the housing having a bottom wall **9**,

means to secure the housing to a support wall comprising a dovetail groove **8** means adapted to receive matching keystone rail means to fit into the dovetail groove, the dovetail groove being slidable over the keystone rail means

the housing being of double wall extruded construction at least in the region of its bottom **9** and rear **10** walls

and having stiffening ribs **11** between the double bottom and rear walls **9**, *9a*; **10**, *10a*;

an awning roll support **6** rotatably secured in the housing;

a terminal bar **4** secured to the awning;

and jointed, articulated arms **1, 2** connected to the terminal bar **4**;

first hinge portions **13** formed at the front end of the double walled bottom wall **10** comprising an elongated open hook-shaped hinge eye **14** extending along the length of the housing **7**;

second hinge portions **5** comprising an elongated rail **16** having a matching elongated open hook-shaped hinge eye **15** hooked into the open hinge eye **14** of the first hinge portion;

and bearing means **5** connected to one end *1b*, *2b* of the arms **1, 2** and secured to the rail **16** to interconnect the arms **1,2** and hence the terminal bar **4** with the housing.

2. Awning according to claim **1**, wherein the inner wall of the box-like structure is formed to have approximately the curvature of the awning roll.

3. Awning according to claim **1**, including means **23–35** limiting the relative deflection of the first hinge portion and the elongated rail, to limit the inclination of the awning when the awning is rolled out and the articulated arms are extended.

4. Awning according to claim **3**, wherein the means **23–35** limiting the deflection of the hinge portions comprises a telescoping tension member **23** pivotally connected to the rail **16** and pivoted in the housing **7** behind the hinge portions **13**;

and means limiting the telescoping elongation of the members.

5. Awning according to claim **4**, wherein the telescoping tension member **23** comprises a threaded bolt **26**;

a sleeve **25** within which the threaded bolt is slidable;

and a nut **27** bearing against the end of the sleeve and threaded on the bolt and limiting the extension of the bolt from the sleeve.

6. Awning according to claim **1**, wherein the open hinge eyes **14** of the first hinge portion and of the elongated rail **16** are formed with an insertion slot to permit assembling the hook-shaped open hinge eyes together by sliding the hook-shaped hinge eye of the rail into the first hinge portion, the hook shaped eyes movably and non-removably retaining the first and second hinge portions together.

7. Awning according to claim **1**, wherein the articulated arms comprise paired interengaging profiled members *1a*, *1b*; *2a*, *2b* which are shaped to fit within each other when folded towards each other.

8. Awning according to claim **7**, wherein one of the profiled members has an essentially U-shaped cross-section having, in cross-section, wedge-shaped sides **40**;

and the other profiled member *1a*, *2a* has an essentially trapeze-shaped cross-section, the sides of which match the taper of the U-shaped member.

9. Awning according to claim **1**, wherein the terminal bar is a light-weight metal extrusion having a longitudinal groove **44** open at the edge, the articulated arms being secured within the groove.

10. Awning according to claim **1**, wherein the terminal bar, when the awning is rolled in, forms a closing side for the housing **7**.

11. Awning according to claim **1**, including a brush **48** extending longitudinally over the width of the aw-

ning located within the housing, the bristles of the brush bearing against the awning material;

and a pivotal connection between the brush and the housing permitting the brush to ride on the awning as it is rolled in and out.

12. Awning according to claim **11**, including a pivoting arm securing the brush **48** at one end thereof an pivoted to the housing at its other end;

and a chamber formed in the housing receiving the brush when the awning is rolled in and retained within the housing.

13. In an awning structure, a double walled housing **7** retaining the awning and adapted to be secured to a support;

a terminal bar **4** for the awning material;

and jointed arms **1, 2** secured to the terminal bar **4** and secured to the housing, respectively, said arms **1, 2** comprising

profiled members *1a*, *2a*, *1b*, *2b* hinged together intermediate their ends, the profiled members adjacent the terminal bar and adjacent the housing, respectively having laterally engaging matching profiles to permit folding of the arms against, and within each other;

the profile of one of the arms being generally U-shaped, the open end of the U facing the other arm and forming outwardly opening, inclined tapered surfaces;

and the profile of the other arm having a generally trapeze-shaped transverse cross-section, the sides of the trapeze fitting against the inner sides of the legs of the U, to fit within the opening formed by the spaced legs of the U.

14. Roll-up awning structure comprising

a box-like housing **7** of formstable, light-weight metal material having means **8** to secure the housing to a support wall;

an awning roll support rod **6** rotatably secured in the housing;

a terminal bar **4** secured to the awning;

and jointed, articulated arms **1, 2** interconnecting the terminal bar and the housing;

the housing having a bottom wall **9**, first hinge portions **13** formed at the front end of the bottom wall and second hinge portions **5** engaging the first hinge portions connected to the arms to interconnect the arms and hence the terminal bar with the housing;

wherein the first hinge portion comprises an elongated open hook-shaped hinge eye **14** extending along the length of the housing **7**;

the second hinge portion comprises an elongated rail **16** having a pair of legs and a matching elongated open hook-shaped hinge eye **15** hooked into the open hinge eye **14** of the first hinge portion;

and bearing means **5** connected to one end of the elongated arm secured to the rail **16**, the legs being formed with facing longitudinal grooves **17, 18** to slidably receive the bearing means therein.

15. Awning according to claim **14**, wherein the bearing means **5** comprises a bolt **19** slidable into the grooves **17, 18** of the rail, the grooves and the bolt being formed with interengaging matching profiles.

16. Roll-up awning structure comprising a double-walled box-like housing and having ribs connecting the walls together formed of formstable, non-deformable material adapted to be secured to a support wall, the outer wall of said housing being formed in the region to be placed against the support wall with a reentrant groove **8** to receive matching attachment means adapted to be secured to the support wall;

a first elongated hinge portion formed at the front end of the bottom wall of the housing and including a hook-shaped eye;

an awning roll support rod rotatably secured within the housing;

a second hinge portion comprising an elongated rail having a matching hook-shaped hinge eye hooked into the hinge eye formed on the housing;

a terminal bar secured to the awning;

jointed, articulated arms **1, 2** interconnecting the terminal bar and the housing;

and bearing means interconnecting the hook-shaped eye hinge and one end of the articulated arms, the other end of the articulated arms being connected to the terminal bar.

17. Structure according to claim **16**, including an elongated rail **16** having open hook-shaped hinge eyes formed thereon and secured the bearing means, the open hinge eyes of the housing and of the rail being formed with an insertion slot to permit assembly of the hook-shaped open hinge eyes together by sliding the hook-shaped eyes of the rail into the hinge portion on the housing, the hook-shaped eyes movably but non-removably retaining the first and second hinge portions together.

18. Roll-up awning structure according to claim **16** further comprising

an elongated brush secured within the housing and bearing against the top of the awning material, the elongated brush being movable secured within the interior of the awning housing to bear against the top of the awning material and clean the awning material as it is rolled in and out and moving transversely with respect to the axis of the roll of the awning to move within the housing as the diameter of the awning roll decreases.

19. Awning construction according to claim **18**, including a chamber formed within the housing receiving the brush when the roll is essentially completely rolled up;

and means pivotally securing the brush within the housing to permit pivoting of the brush and riding against the upper surface of the awning material.

* * * * *

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,782,443 Dated January 1, 1974

Inventor(s) Manfred Clauss et al.

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

In the claims:

All reference numerals throughout the claims should have parentheses placed there around.

Signed and sealed this 3rd day of September 1974.

(SEAL)
Attest:

McCOY M. GIBSON, JR.
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents

FORM PO-1050 (10-69)

USCOMM-DC 60376-P69
* U.S. GOVERNMENT PRINTING OFFICE : 1969 O—366-334.