June 22, 1965 J. H. ROTHWELL 3,190,345

SUN BLINDS OR SHUTTERS

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FIG. 1

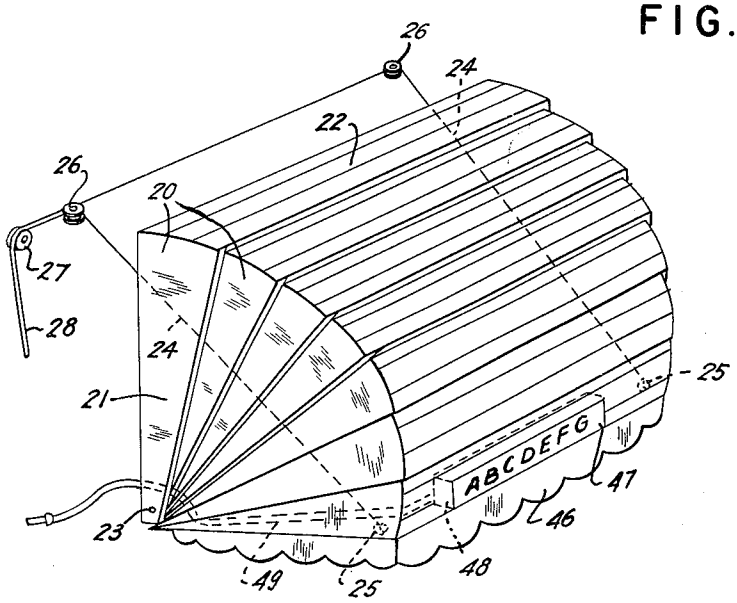
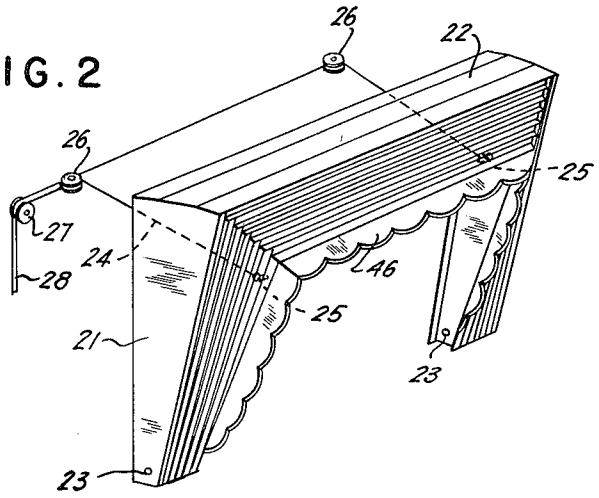


FIG. 2



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FIG. 3

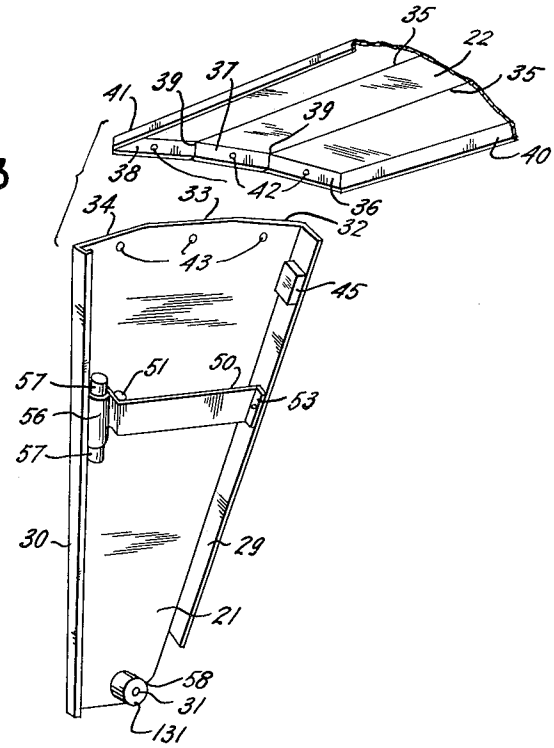
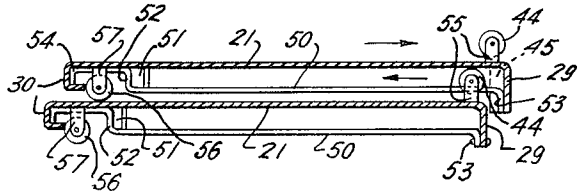


FIG. 4



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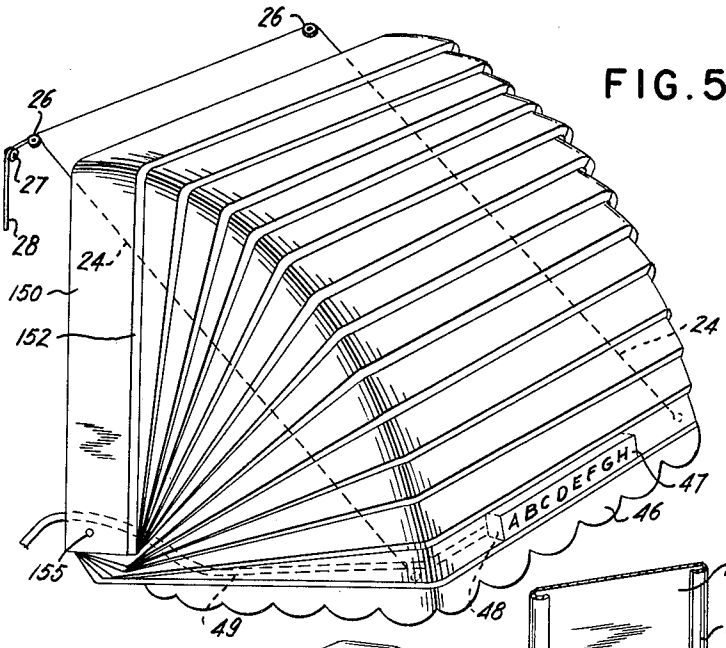


FIG. 5

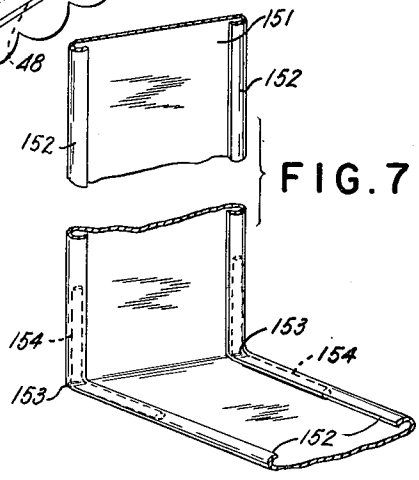


FIG. 7

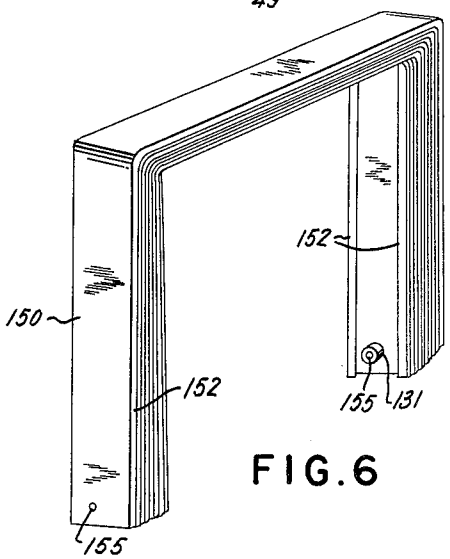


FIG. 6

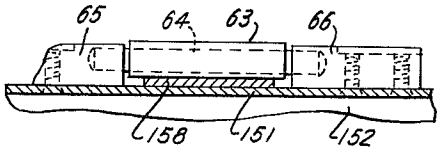


FIG. 11

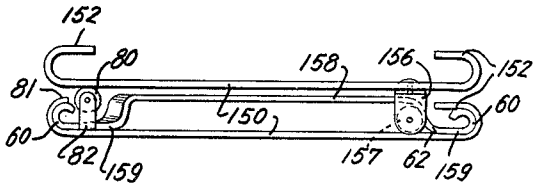


FIG. 12

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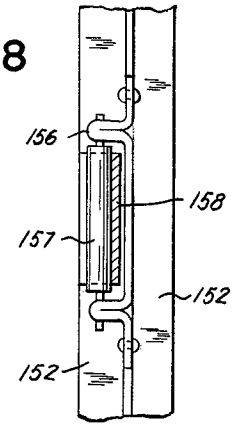
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FIG. 8



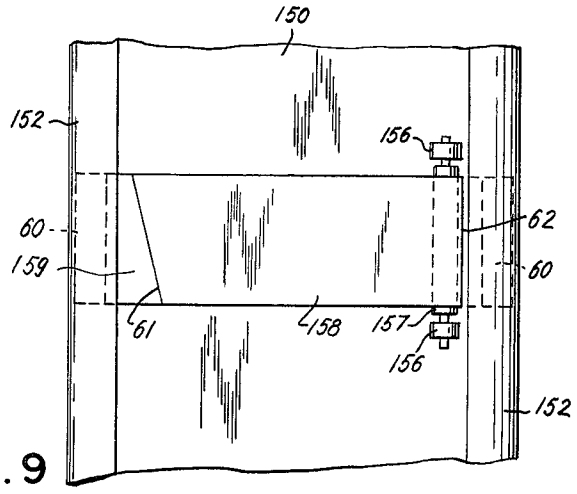


FIG. 9

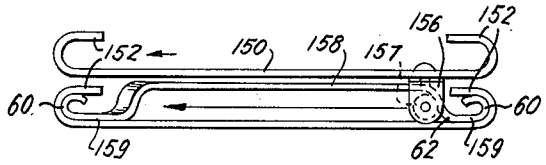


FIG. 10

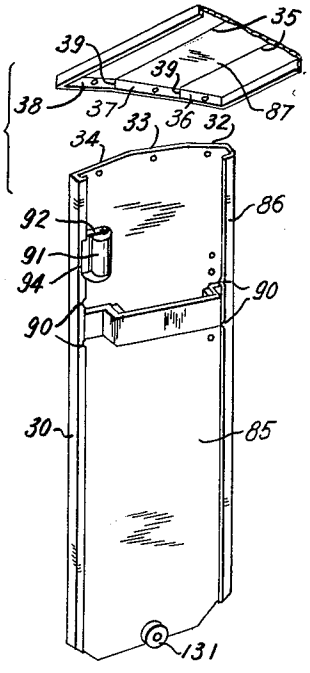


FIG. 13

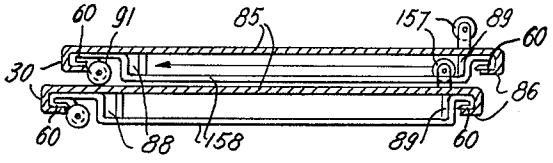


FIG. 14

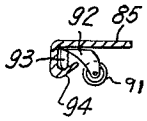


FIG. 15

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United States Patent Office 3,190,345 Patented June 22, 1965

3,190,345

SUN BLINDS OR SHUTTERS

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Filed June 7, 1962, Ser. No. 200,857
3 Claims. (Cl. 160—132)

This invention is for improvements in or relating to sun blinds or shutters and is a continuation in part of my co-pending application Serial No. 859,208 filed December 14, 1959, and now abandoned. One of the objects of the invention is to provide a form of construction which is effective in use and capable of withstanding long exposure to weather conditions without deterioration. A further object is to provide a particularly robust form of construction capable of functioning effectively over a long life without requiring a substantial amount of maintenance attention.

In accordance with the invention there is provided a sun blind or shutter in the form of an extensible and collapsible hood or canopy comprising a plurality of interfitting hood sections of sheet material pivoted to swing into and out of one another, said hood sections having sides which are pivoted at their lower parts about a common transverse axis, and having means constraining the hood sections against relative lateral displacement comprising sets of rollers and track plates mounted sequentially on the hood sections so that each roller and its co-operating track plate are on adjacent hood sections. This form of construction is relatively simple and effective and enables a sun blind to be provided of a long lasting character which will retain a neat appearance despite exposure to varying weather conditions. Conveniently the sets of rollers are so mounted that each track plate whilst secured to one hood section extends between its co-operating roller and the adjoining hood section on which such roller is mounted. This ensures lateral stability between the hood sections and can be arranged to ensure that the hood sections once assembled are prevented from falling apart from one another.

The rollers and track plates may co-operate to provide stops for limiting relative movement between adjoining hood sections in at least one direction. To this end the track plates may be shaped to provide end stops to limit movement of the rollers so as to define limits of relative movement between the hood sections.

It is advantageous to have the hood sections also provided with guiding rollers which are mounted on the hood sections carrying the track plates to engage with the sides of the hood sections carrying the rollers which co-operate with such track plates, thus providing additional guiding means during relative movement between the hood sections.

The hood sections may be provided with side portions which may be downwardly tapering or of parallel sided form and in the latter case each hood section is conveniently constructed from a continuous length of material having substantially the same width throughout, bent to the required form of the hood section. Such a hood section may be formed with curled in flanges at its forward and rearward edges. In this case corners of the hood sections may be formed by notching the flanges to permit bending the strips and reinforcing the corners by angle pieces fitted within the flanges.

In the case of hood sections formed with inturned flanges the track plates aforementioned may be contained within the depth of the flanges end if desired anchored by engagement under lips of the flanges.

Further provisions of the invention relates to the manner of construction of the hood sections with front and rear flanges and the construction of the hood sections

from separate sides and top portions in a manner to cause them to present approximately an arcuate top shape in side view.

Certain preferred forms of construction in accordance with the invention are shown by way of example in the accompanying drawings and will now be described with reference to the drawings in which

FIGURE 1 is a perspective view of one form of sun blind or shutter shown in the extended setting;

FIGURE 2 is a corresponding view of the part shown in the closed up setting;

FIGURE 3 is an enlarged exploded perspective view of parts of one hood section used in the blind or shutter;

FIGURE 4 is an enlarged cross sectional plan view taken through two hood sections at one side of the blind or shutter showing the rollers and track plates;

FIGURE 5 is a perspective view of an alternative form of sun blind or shutter shown in the extended or lowered setting;

FIGURE 6 is a view corresponding to FIG. 5 with the parts shown in the closed up setting;

FIGURE 7 is an inside inverted view partly broken away of a portion of one of the hood sections of FIG. 5;

FIGURE 8 is a detailed sectional front elevation view showing one form of locating means at the sides of the hood sections of FIGS. 5 to 7;

FIGURES 9 and 10 are respectively an inside elevation and a sectional plan view of the parts in FIG. 8;

FIGURE 11 is a detailed sectional view illustrating a modification of the arrangement of FIG. 8;

FIGURE 12 is a view corresponding to FIG. 10 showing a further modification;

FIGURE 13 is a view similar to FIG. 3 but showing a further modification;

FIGURE 14 corresponds to FIG. 12 and shows on an enlarged scale the track plate arrangement of FIG. 13, and

FIGURE 15 is an enlarged detail view in cross sectional plan of a portion of FIG. 13.

Referring to FIGS. 1 to 4 of the drawings, the sun blind or shutter comprises a plurality of interfitting hood sections **20**, each formed from sheet metal and comprising downwardly tapering sides **21** joined by a substantially rectangular top **22**. The hood section which is lowermost in the extended setting is of slightly smaller width and height dimensions than the adjacent section which in turn is of slightly smaller width and height dimensions than the next preceding section, and so on, so as to permit the sections to move into and out of one another. To operate the sun blind or shutter there are two cords or flexible wires **24** shown diagrammatically in FIGS. 1 and 2 as extending from anchorages **25** on the inside of the innermost hood section **20** near the top thereof to pass over rollers **26** and thereafter together over a roller **27** and depend therefrom as at **28**. The outermost hood section **20** is adapted to be fixed in position either directly or by means of a bracket or frame to a wall around the upper part of a window or doorway, and the pivoting of the hood sections is such that when collapsed as in FIG. 2 their centres of gravity lie outwardly from the pivot **23** so that when free they will move by gravity from the closed or collapsed setting of FIG. 2 towards the extended setting of FIG. 1. Thus by releasing the cords or wires at **28** the sunblind or shutter may be extended, while a pull on the cords at **28** will cause the sections to be collapsed from the position of FIG. 1 to that of FIG. 2, the cords being then anchored in tension to hold the hood sections collapsed.

FIG. 3 illustrates a convenient construction for each hood section showing one of the side portions **21**, which may be formed of sheet metal of the tapered form shown having a wide flat flange **29** along its rearward edge

and a shallower turned over flange 30 at its forward edge. A pivot hole 31 for the pivot 23 is formed partly in the lower part of the side nearer to the rear flange 29 and partly in a spacing bush 131 attached to the inner face of the side portion 21. The upper edge is preferably formed with three flats 32, 33 and 34 to cause it to approach an arcuate form roughly concentric with the pivot hole 31. The top 22 of each hood section which may also be formed from sheet metal is slightly bent along lines 35 to conform to the edge formation at 32, 33 and 34 and has turned over end flanges 36, 37 and 38 abutting at the edges of the cutouts at 39, a deep rearward flange 40 and a shallow forward flange 41 corresponding to flange 30. The two sides 21 and the top 22 are assembled with the flanges 36 and 38 against the top parts of the sides 21 and may be riveted thereto by flush rivets passing through rivet holes 42 in the flanges 36 to 38 and rivet holes 43 in the upper edge portions of the sides 21.

As above described each hood section differs slightly in height and width dimensions from its adjacent sections so that the sections can be interfitted. On the outer rearward part of each side 21 on each inner hood section there is fitted a roller 44, FIG. 4, to co-operate with a strip-like track plate 50 fitted internally to the next outward hood section and at the upper part of the rear flange 29 there is fitted internally thin resilient pad 45. When the parts are assembled to form the sun blind or shutter the sides 21 interfit as shown in FIG. 4, which illustrates in cross section the closed up setting of two hood sections, and it will be seen that as each inner section moves forwardly and downwardly its roller 44 will run along the co-operating track plate and engage ultimately with a cushioning pad 51 fitted against a shoulder 52 of track plate 50 on the next outer hood section to limit the outward movement of the section carrying the roller 44. On the return movement to the collapsed setting the flanges 29 overlap one another and engage to determine the closed up setting, the pads 45 serving as buffers.

The hood section 20 which is lowermost in the extended setting is shown in FIGS. 1 and 2 as being fitted with an ornamented strip 46 to simulate an orthodox sun blind frill. The hood sections 20 may be provided with any desired exterior finish to suit a desired colour scheme, and alternate sets of sections can be finished, if desired, in contrasting colours. The front and/or sides of any of the hood sections 20 and particularly the one which is lowermost when extended may be formed as indicated at 47 in FIG. 1 with a cut out design or inscription which may be backed by a transparent or translucent sheet in any colour. Such a cutout may be illuminated from within by illuminating means such as a strip fluorescent light or lights as indicated generally at 48, and energised by flexible leads 49 running along the inside of the innermost hood section 20 to near the pivot axis 23 and thence to a connection to a supply.

More particularly the arrangement of the rollers 44 and track plates 50 in each set is as follows. The track plate 50 has one end bent over to form a shallow flange 53 at its rear which is fixed, e.g., by rivetting to the rear flange 29 of the appropriate hood section side. Towards its forward end the track plate is cranked outwardly to form the shoulder 52 and an end piece 54 which is curled into the front flange 30 the latter being of overturned form. The roller 44 has end pintles which turn in bearing blocks 55 fixed externally to each inner hood side portion 21 above and below the track plate 50.

Thus the operative part of each track plate 50 on a given hood section is interposed between the side of the next inward hood section and the roller 44 thereon. This inter-engagement between the parts of the hood sections at each side provides for their relative lateral location at all times and also positively prevents the hood sections, once assembled, from becoming separated from one another. To assist in smooth operation of the sun blind there is provided at the front of each outer hood section on each side a further roller 56 positioned between the flanges 30 and the shoulder 52 of the track plate 50. The roller 56 serves as a guide roller and runs on the outer face of the side 21 of the next inward hood section, having end pintles running in bearing blocks 57 fixed to the outer hood section above and below the forward end 54 of the track plate 50.

A particularly attractive characteristic of the sun blind described is that the arrangement and interconnection of the hood sections provides a very robust construction which is free from objectionable rattle. The cushioning pads 45 and 51 moreover serve further to reduce rattling and jarring of the parts during their operation. The shoulders 52 are conveniently slanted somewhat in relation to the length of the track plates 50 to allow for the canting movement of the rollers 44 during their outward swing about the pivot 31, so that the rollers 44 will engage squarely with the pads 51 on said shoulders. Further it is advantageous to cut away to arcuate form the lower rear edges of the sides 21 as indicated at 58 in FIG. 3 to afford adequate clearance for pivoting movement.

In an alternative form of construction illustrated in FIGS. 5 to 12, the hood sections are shown at 150 and are each constructed with their side portions and top portion of the same width throughout, that is to say their side portions as well as the top have parallel side edges. The hood sections 150 may be constructed each from a length of lightweight metal of a standard section having a flat base 151 and curled in flanges 152 at the sides, see FIG. 7. The hood sections 150 are pivoted at the lower parts of their sides at 155 to aligned stub pivots being fitted with spacing bushes 131 as in the first construction. Thus they can swing telescopically into and out of one another to move into the collapsed position of FIG. 6 and the extended position of FIG. 5. The width and height dimensions of the several hood sections are relatively similar to those of FIGS. 1 to 4. The arrangement is such that the centres of gravity of the hood sections 150 lie outwardly from the pivot 155 to permit them, when free, to move by gravity from the closed to the extended setting.

As shown more particularly in FIG. 7 the standard section of material from which the hood sections 150 are made has a flat base 151 and curled in side edges 152 which besides giving rigidity to the material form convenient recesses for mounting of locating means as will later appear. To bend the material to the three sided rectangular form as required for the hood sections of FIGS. 5 and 6 the flanges are notched as at 153 where the corners are required and the material bent until the edges of the notches abut and angle rods 154 are fitted within the flanges to give the requisite corner strength and held in place by clinching the flanges round them. The hood sections 150 can readily be made of contrasting appearance by having a set of alternate ones differing in colour from the remainder or by having other contrasting colour schemes, since light metal section suitable for use in forming them is readily obtainable and finished in various colours.

To locate the hood sections 150 in relation to one another in the closed and open settings locating means as illustrated in FIGS. 8 to 10 may be used. To this end each hood section 150 after the initial fixed one has fitted externally on each side at an appropriate distance from the pivot 155 and adjacent to its rear edge a roller bracket 156 conveniently formed of pressed sheet metal and carrying a freely rotatable roller 157. The roller 157 co-operates with a strip like metal bracket 158 forming a track plate mounted at an appropriate position on the inside of the next adjacent larger hood section, the bracket 158 having depressed end portions 159 and curled over ends 60 to engage with a tight fit in the recesses of the outer hood section provided by its side flanges 152. The central part of the bracket 158 forms a track way for the roller and is assembled to engage between the

roller **157** and the base of its bracket **156** on the adjacent inner hood section. The depressed ends **159** provide shoulders **61** and **62** forming end stops for the roller **157**, the shoulder **61** serving to limit the outward movement of the roller and being slanted in relation to the length of the side of the hood section so as to engage squarely with the roller when it is canted about the pivot **155** of the hood section, whilst the shoulder **62** forms a stop limiting the collapsing movement of the hood sections in the position of FIG. 10. Provision may be made for adjusting the roller brackets **156** longitudinally of the side arms of the hood sections **150** to permit adjustment of the required amount of projection of each hood section in the extended position, the brackets **158** being adjustable similarly by sliding in the recesses provided by the flanges **152**.

In the roller mounting of FIG. 8 the roller **157** needs to be kept of relatively small diameter because of the need for accommodating the base of bracket **156** as well as the thickness of bracket **158** and the roller diameter within the available shallow space between the two adjoining hood sections. An alternative form of roller mounting is shown in FIG. 11 in which a roller **63** on a spindle **64** has its spindle ends bearing in separate end brackets **65** and **66** and runs on the bracket **158** which is received directly between the side of the inner hood section **150** and the roller **63** without the intervention of any part of the roller bracket. This modified arrangement enables a slightly larger roller to be used. In each case the roller **157** or **63** may be of metal or if desired of rubber or other resilient material.

In the modified construction shown in FIG. 12 there is accommodated between the shoulder **61** of the trackway plate or bracket **158** and the adjacent curled-over flange **152** of each outer hood section, on each side thereof, a further roller **80** which serves as a steadying roller. To accommodate this roller, the flanges **152** may be cut away as indicated at **81** and the roller may be supported by end brackets **82** secured to the inner face of the outer hood section above and below the end of the bracket **58**. This steadying roller **80** by tracking on the outer face of the next inward hood section will (like the roller **56**) serve to maintain the sides of the hood section in proper parallelism at positions removed from their pivots during the extending and collapsing movements of the hood sections.

The construction of FIGS. 1 to 4 may be modified by having the side portions **21** of the hood sections made parallel sided instead of tapered, with the track plates **50** modified to provide stops to limit the extent of the closing as well as the opening movements of the hood sections. Such a modification is illustrated in FIGS. 13 to 15 in which a side portion **85** of a hood section has its front edge formed as a turned in flange **86** parallel and similar to the rear turned in flange **30**. The side portions **85** have their upper ends formed with flats **32**, **33** and **34** in arcuate arrangements as in FIGS. 1 to 4 and each pair of side portions is joined by a substantially rectangular top **87** which is slightly bent along lines **35** to conform to the edge formation at **32**, **33** and **34** and has turned over end flanges **36**, **37** and **38** as in the first construction illustrated. In FIGS. 13 to 15 the sides **85** of the hood sections are fitted with track plate brackets **158** constructed as shown in FIG. 10 and having their bent over ends **60** engaged in the turned over flanges **30** and **86**. As before the tracks **158** co-operate with rollers **157** and may be fitted with buffer pads **88** and **89** to cushion the limiting stops for the rollers **157** at the opposite ends of their travel. The track plate brackets **158** are assembled by sliding their ends **60** along the flanges **30** and **86** and may be secured in the desired position by indenting the inturned edges of the flanges **30** and **86** as at **90**. The sides **85** of the hood sections are fitted each with a steadying roller **91** corresponding to the rollers **56** and **80** of the earlier constructions except that they are positioned nearer to the top ends of the sides **85**. The rollers **91** have pintles which turn in bearing holes in the ends of a bracket **92** which as shown more clearly in FIG. 15 has a central cross bar **93** running within the side of the flanges **30** the latter being locally indented as at **94** over the cross bar **93** to retain the bracket **92** in the required position.

It will be evident that the forms of construction illustrated may be modified by shaping the interfitting hood sections to curved arch like form as viewed from the front, and also that the hood sections may be formed from plastic or other non-metallic material if preferred.

What I claim is:

1. A sun blind formed by an extensible and collapsible hood comprising a plurality of inter-fitting hood sections each having two sides and a top portion, means for pivoting the lower ends of the sides of the hood sections to one another to permit the hood sections to swing about a common axis into and out of one another, sets of rollers and cooperating track plates interconnecting adjacent hood sections at each of their sides, means for mounting said rollers respectively externally on the sides of inner hood sections so as to extend substantially radially of the pivotal axis of the hood sections when the hood sections are in their extended position, means for mounting said track plates each internally on a side of a hood section next outermost to that carrying the related roller so that the track plate extends transversely of the axis of its roller and between such roller and the hood section carrying the roller, buffer stop means to cooperate with said rollers to limit pivoting movement of the hood sections, sets of guiding rollers and means for mounting said guiding rollers internally on the sides of the hood sections with their axes substantially radially of the pivotal axis of the hood section so that the guiding roller on each side of each hood section bears against the outer face of the next adjoining inward hood section.

2. A sun blind according to claim 1 wherein the track plates are angled to form abutments supporting the buffer stop means.

3. A sun blind formed by an extensible and collapsible hood comprising a plurality of interfitting hood sections each having two sides and a top portion, the sides of said hood sections being of the same top to bottom width, means for pivoting the lower ends of the sides of the hood sections to one another to permit the hood sections to swing about a common axis into and out of one another, track plates fitted one to each side of each hood section other than the most inward hood section, said track plates being fitted on the inside of the hood sections and having inwardly offset guide tracks extending across the width of the sides of the hood sections, sets of rollers to cooperate with the track plates, means for mounting said rollers externally on the sides of the hood sections other than the most outermost hood section so as to cooperate with the track plates and engage the latter between the track plates and the sides of the hood sections on which the track plates are mounted, buffer stops provided on the track plates to cooperate with the rollers in limiting the extended setting of the hood sections of the sun blind, sets of guiding rollers and means for mounting said guiding rollers internally on the sides of the hood sections with their axes substantially radially of the pivotal axis of the hood section so that each guiding roller bears against the outer face of the next adjoining inward hood section.

References Cited by the Examiner

UNITED STATES PATENTS

1,344,093	6/20	Shogren	160—381
1,771,554	7/30	Bollheimer	160—132
2,891,616	6/59	Nelson.	
3,047,059	7/62	Trinchero	160—132

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LAWRENCE CHARLES, *Examiner.*