Oct. 5, 1965 R. T. MEREDITH ETAL 3,209,373

SWIMMING POOL COVER

Filed Jan. 16, 1963 3 Sheets-Sheet 1

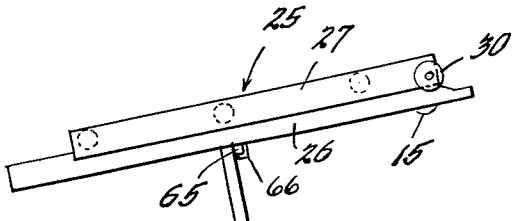


FIG. 2.

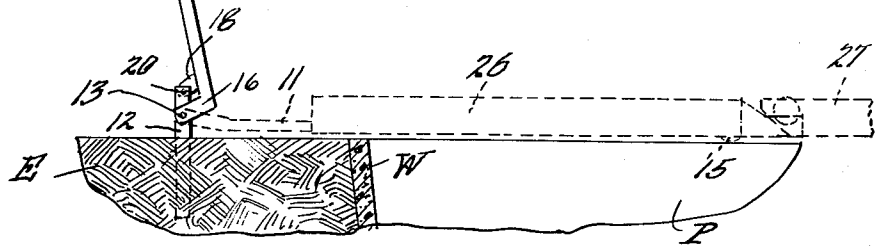
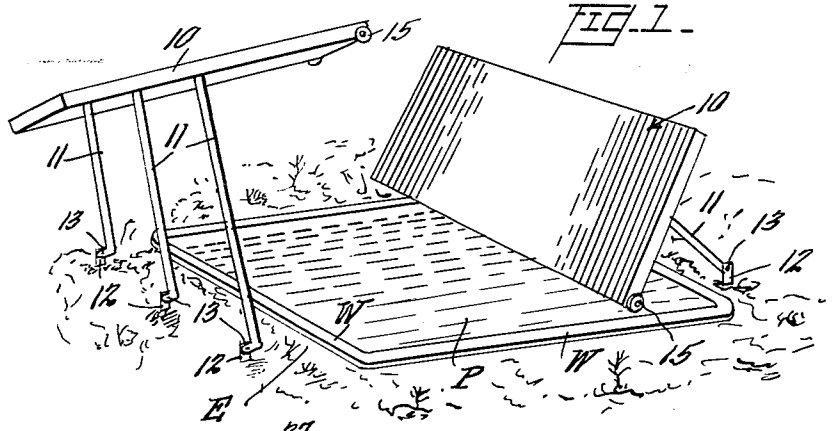


FIG. 1.



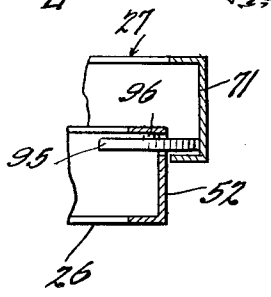


FIG. 7.

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SWIMMING POOL COVER

Filed Jan. 16, 1963 3 Sheets-Sheet 2

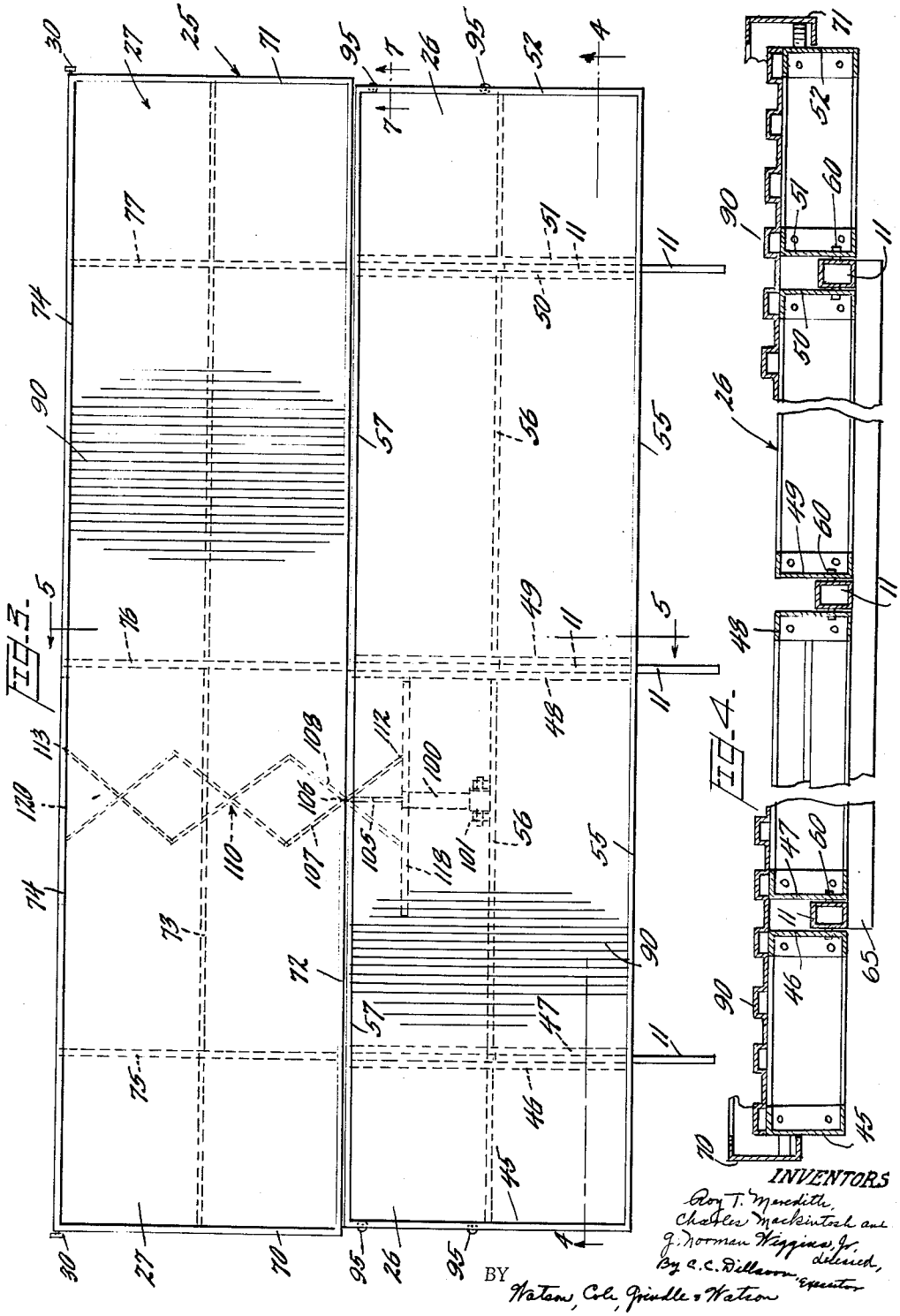


FIG. 3.

FIG. 4.

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SWIMMING POOL COVER

Filed Jan. 16, 1963 3 Sheets-Sheet 3

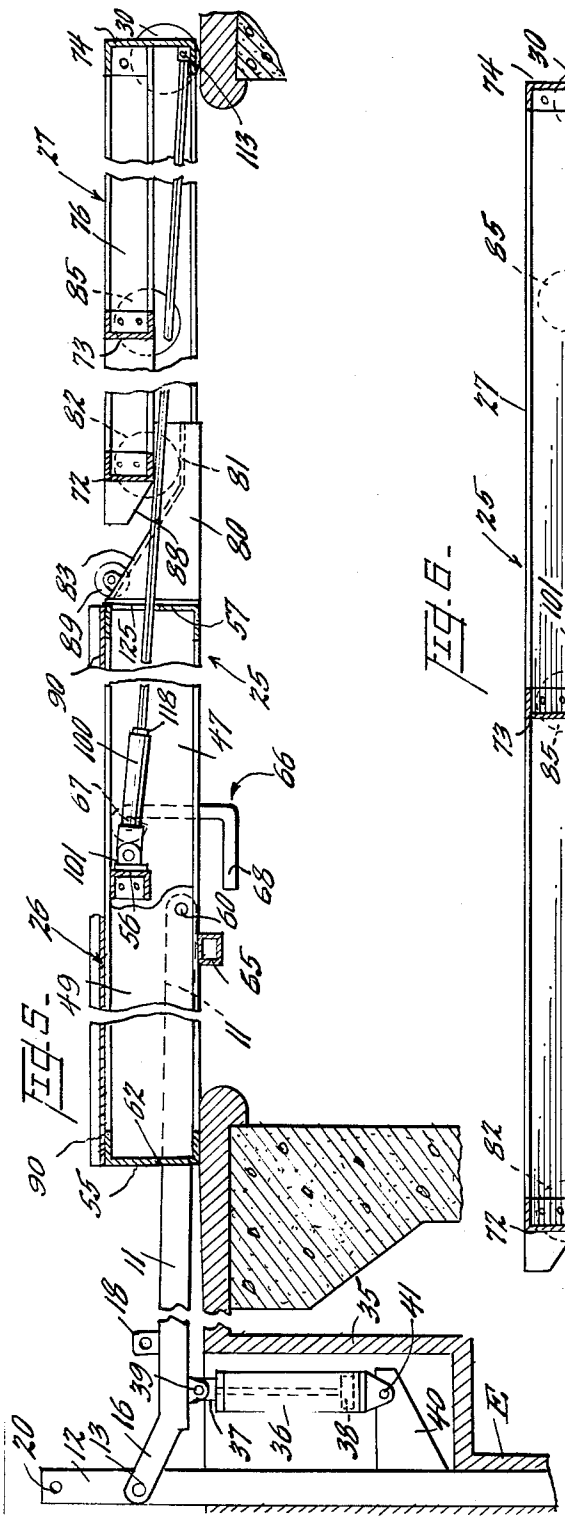


FIG. 5.

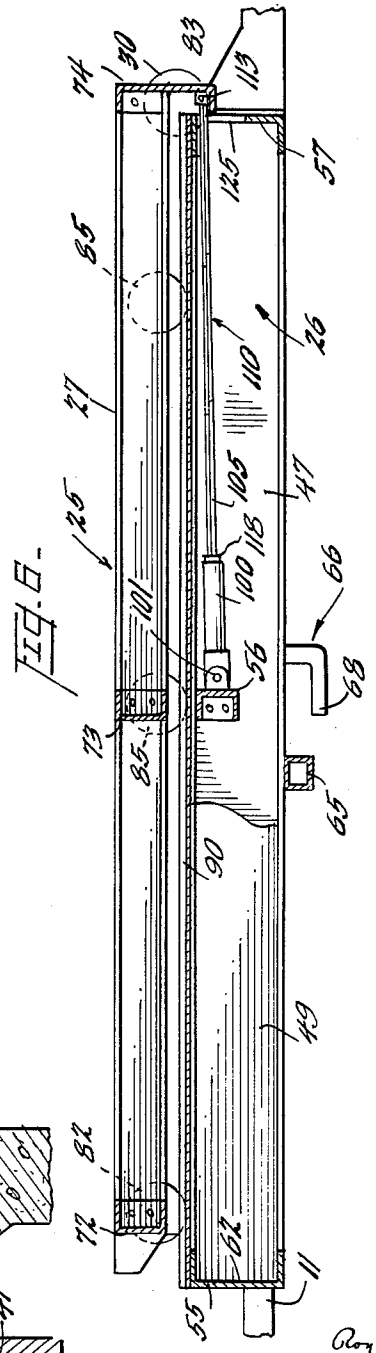


FIG. 6.

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3,209,373

SWIMMING POOL COVER

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This invention relates to swimming pools and more particularly to combined swimming pool safety covers and awnings.

The general object of the invention is the provision of novel and improved structures for the purpose indicated, and improved means for operating such structures.

In its preferred embodiments, the invention contemplates the provision of novel fluid pressure operated lifting and lowering means for bringing the cover structure into raised position where it may act as an awning for protection from rain or sun, and into lowered position over the pool itself.

Novel latching means are provided for retaining the pool covering and the raising and lowering struts in proper relationship in both limiting positions.

Another object of the invention is the provision of corrugated Fiberglas covering panels for the pool cover framing.

In one embodiment of the invention two similarly constructed and similarly operated separate covers are employed, which are projected over the pool from opposite sides and ultimately have their edges in contact along the center line of the pool.

In another embodiment two or more cover units are arranged in "piggy-back" style at one side of the pool, the multiple units being disposed one above the other when in raised awning position, but with the upper unit or units rolled out and extended to cover the remaining portions of the pool, when the device is lowered.

Other objects and features of novelty will be apparent from the following specification when read in connection with the accompanying drawings in which certain embodiments of the invention are illustrated by way of example.

In the drawings:

FIGURE 1 is a rather generalized or non-detailed view of a swimming pool and cover assembly embodying certain of the principles of the invention, one cover section being shown in raised or awning position and the other in an intermediate position adjacent the surface of a pool;

FIGURE 2 is a view in vertical section transversely of one side of the pool and illustrating also in rather generalized form a modification of the invention wherein the cover section is extensible so as to cover a greater surface area of the pool from an installation at one side thereof, or in the case of very large pools, from both sides;

FIGURE 3 is a generalized plan view of the cover of FIGURE 2 as applied to the pool;

FIGURE 4 is a vertical longitudinal sectional view taken on line 4—4 of FIGURE 3;

FIGURE 5 is a transverse sectional view taken on line 5—5 of FIGURE 3;

FIGURE 6 is a view similar to FIGURE 5 but showing the two sections in overlapping retracted positions; and

FIGURE 7 is a detail view in vertical section as taken on line 7—7 of FIGURE 3.

The embodiment of the invention shown in somewhat generalized and non-detailed form in FIGURE 1 of the drawings will be described first, since the separate units of the covering arrangement employed therein are of the simpler nature, and similar operating and securing means may be employed in connection with both embodiments.

The pool designated by the reference character P has a peripheral wall W of the conventional concrete construction, the terrain surrounding the wall being indicated at E, the areas of which, particularly adjacent the margin of the pool, being appropriately paved either with concrete, brick, tile, or other surfacing material (not shown).

For purposes of general illustration some details and operative parts are omitted from FIGURES 1 and 2, these being shown in the remaining detailed figures. Suffice it to say that the cover sections in the embodiment illustrated in FIGURE 1, which sections are designated **10** in that figure, are supported by a plurality of struts **11**, the lower ends of which are pivoted to supports **12** which may comprise posts set in the ground surface E and projecting a short distance upwardly therefrom. The struts **11** have an offset pivotal connection with the supports **12** which is suggested at **13** in FIGURE 1 and described later on in connection with the detailed figures.

The upper ends of the struts **11** are pivotally connected with the cover sections **10** in the vicinity of the longitudinal line passing through the lateral center of gravity of the particular section **10**. Means, to be described later, for determining the angular upward position of rest of the struts **11** and also the angular position of the sections **10** in their upper position to provide a suitable awning or sunshield for users of the pool will also be described presently.

In order to provide for the smooth travel of the forward edges of the sections along the pool margin **11** wheels or large rollers **15** are rotatably mounted at these leading edges, and it will be readily seen from FIGURE 1 how, when the leading edge of a section approaches the pool margins as at the right-hand side of the figure, the wheels **15** come into rolling contact with the margin or curbing of the pool and move therealong in an anti-friction manner until both sections are brought together each covering one-half of the pool surface.

Bearing in mind that the operating means for elevating and lowering the pool sections by means of the struts **11** are the same in all embodiments of the invention, one important modification or alternative embodiment of the invention will be understood from an inspection of FIGURE 2 of the drawings. Here the supports or posts **12** are somewhat more clearly shown and it will be perceived that the struts **11** are of angular configuration each having a lower extension **16** which is pivoted to the post **12** as at **13**. It will also be observed that a projection **18** extends from a point near the lower end of the strut **11** and this projection may be locked by a pin or any other suitable means as at **20** to the extreme upper end of the post **12** to maintain the struts in the desired upper position.

The principal difference between the embodiment illustrated in FIGURE 2 and that disclosed in FIGURE 1 lies in the nature of the pool cover itself. In FIGURE 2 there is illustrated an extensible cover **25** of what may be termed a "piggy-back" arrangement and consisting of a lower panel structure **26** and an upper panel **27** in rolling contact therewith. The lower section **26** is provided with wheels **15** as in the other embodiment and the upper section **27** is also provided with end wheels **30** which serve a similar purpose in providing anti-friction rolling contact of the extensible panel **27** with the margin W of the pool.

It will be readily apparent how the sections may be brought into covering relationship with the pool. In

broken lines in FIGURE 2 of the drawings, the lower positions of the struts **11**, the lower panel **26**, and the upper panel **27** are shown. In most cases two panels such as **26** and **27** may suffice to cover the entire pool. However, it will be readily apparent that within the purview of the present invention extensible sections could be employed upon both sides of the pool in substitution for the simple panels **10** of FIGURE 1 and thus suffice to protect a pool of four times the width of a panel. Also, it is within the scope of the present invention to provide more than two panels in the piggy-back arrangement suggested in FIGURE 2.

Before describing the multiple panel installation of FIGURE 2 in its details, there will be described the preferred actuating means for either type of installation by reference particularly to FIGURES 4 and 5 of the drawings.

In FIGURE 5 the post **12** is most clearly shown as embedded in the ground E and one of the struts **11** with its angled end portion **16** is pivoted as at **13** to the post **12**. The projection **18** is clearly shown as well as the registering openings therein and in the upper end of the post which affords the securing connection designated **20**.

Disposed within an enclosure provided by the masonry or concrete wall **35** is disposed power means for raising and lowering certain of the struts **11** and therefore the panels. This comprises a hydraulic motor comprising a cylinder **36**, a piston rod **37** secured at its lower end to a piston suggested at **38** within the cylinder **36**. The upper end of the piston is pivotally connected with a point spaced from the lower end of the strut **11** as indicated at **39** and the lower end of the cylinder **36** is pivotally connected to a bracket **40** as at **41**. This bracket **40** may extend from and be supported by the post **12**. In most cases, the provision of the power means **36** in connection with only one of the struts **11**, preferably a centrally located one, may suffice.

Conventional means for supplying pressure fluid to the cylinder **36** and exhausting it therefrom in order to extend and retract the piston rod **37** are provided, but these may assume any appropriate form and are therefore not illustrated in the drawings.

In the preferred embodiments of the invention the panels **10** or **26** and **27** are composed of channel beams bolted or riveted together to provide a rectangular framework. Counting longitudinally of the panel **26**, which may be also typical of the single panel **10** of the embodiment of FIGURE 1, and with particular reference to FIGURES 3 and 4, the transverse beams are designated **45, 46, 47, 48, 49, 50, 51,** and **52.**

Counting transversely of the panel **26** as seen in FIGURES 3, 5 and 6 the longitudinal beams are designated **55, 56,** and **57,** the channel beam **56** being of smaller dimension than the others for a purpose to be described later.

It will be seen that each of the struts **11** which are preferably of tubular construction with substantially square cross sections, are entered between the pairs of beams **46** and **47, 48** and **49,** and **50** and **51** and pivoted by means of the pins **60** which pass through the upper ends of these struts. Very obviously portions of the web and bottom flange of the innermost longitudinal beam **55** will have to be cut away as shown at **62** in FIGURES 5 and 6 to accommodate the strut **11** when the arrangement is in lowered position.

It will be seen how the means **18** and **20** serve to lock the struts in the position suggested in FIGURES 1 and 2 preferably at an angle just beyond the vertical, and there will now be described the means for securing the panels **10** or **26** in the properly angled position shown in FIGURES 1 and 2, with relation to the struts. Extending transversely of and rigidly secured to all of the struts as by welding, is the tie bar **65**, which may be of squared tubular construction similar to the struts themselves. A hook-shaped latching member **66** is pivoted as at **67** to

one of the transverse beams. It will be understood that when the panel moves upwardly through its slightly angled position the hook **66** will still depend approximately vertically and, as the strut passes through its angular movement to assume the positions shown in FIGURES 1 and 2, the transverse tie bar **65** and the hook portion **68** of the latch **66** will come into locking engagement, as clearly shown in FIGURE 2 of the drawings, whereupon the cover panel is held in safe and secure position with respect to the struts.

An inspection of the drawings and a realization of the requirements of the operation of this particular embodiment of the invention, will reveal that preferably the tie bar **65** should be positioned downwardly along the struts **11** at points spaced from the pivots **60** a distance which is approximately equal to the distance of the point **60** from the lower edge of the beams **46**, etc. so that as the struts **11** swing to approximately vertical position and the cover member is raised to awning position, the tie bar **65** will abut the lower edge of the beams as shown in FIGURE 2 of the drawings. It will also be obvious from the graphic disclosure that the right-hand edge of the tie bar **65** as viewed in FIGURE 5 will be the uppermost edge and the one which abuts the lower edge of the beam structure in FIGURE 2. It is also desirable from the viewpoint of compactness of structure, that the distance between the pivot **60** and the lower edge of a strut **11** as viewed in the down position as in FIGURE 5, be equal to the distance between the pivot **60** and the lower edge of the beam structure.

The extensible cover arrangement suggested in FIGURE **2** will now be described in considerable detail.

The extensible panel **27** is slightly longer than the panel **26** and is provided with enveloping transverse end beams **70** and **71** and longitudinal beams **72, 73** and **74.** Interior transverse beams such as indicated at **75, 76** and **77** are also provided in making up the framework of the upper covering panel **27.**

The marginal beams **70, 71** and **74** of the upper panel **27** may be of full depth similar to the marginal beams of the lower panel **26,** but all of the internal longitudinal and transverse beams of the upper structure **27** and also the inwardly disposed marginal beam **72** are of abbreviated height so that the panel **27** may surmount the panel **26** for the greater part of its area while the marginal beams **70, 71** and **74** envelop the lower panel on three sides. These provisions are most clearly perceived in FIGURES 5 and 6 of the drawings as will also be found the showings of the supporting wheels or rollers **30** at the outer corners of the upper panel **27.**

Projecting outwardly from the outer beam **57** of the lower panels **26** are a plurality of ramps **80,** these ramps having a horizontal portion **81** for supporting the wheels **82** of the upper panel **27** and an inclined portion **83** along which the wheels **82** and the supplemental wheels **85** may roll during the retraction of the extensible cover **25.**

Furthermore, certain of the transverse beams of the upper panel **27** have bevelled undersurfaces at their ends as indicated at **88** in FIGURE 5, and rollers **89** are carried adjacent the end beams **57** of the panel **26** whereon the inclined portions **88** and the continuing lower portions of certain of the transverse beams may roll.

In fully retracted position the parts of the panels **26** and **27** occupy the relative position shown in FIGURE 6 of the drawings where the end longitudinal beam **74** of the panel **27** is in substantial abutment at its lower edge with the upper edge of the end beam **57** of the lower panel **26.**

Preferably both panels **26** and **27** are covered with undulating or corrugated Fiberglas which may be, if desired, of a translucent nature, these coverings being indicated at **90** in FIGURES 3 and 4 of the drawings. This covering material does not interfere with the travel of the rollers of the upper panel **27** across the face of the lower panel **26** and in fact if desired the rollers may be

positioned so as to run in certain of the grooves of the corrugated Fiberglas covering **90**. Fiberglas is the trademark of products made by Owens Corning Fiberglas Corporation, of or with glass fibers which are flexible, non-inflammable, and not affected by moisture and most acids; are rust, rot and mildew proof; and possess the greatest tensile strength-weight.

As a further means for anti-frictionally guiding the upper panel **27** with relation to the lower panel **26** vertically axled rollers may be employed as suggested in FIGURE 7 of the drawings. Such a roller is indicated at **95** and is rotatably secured as at **96** to a portion of one of the side beams **52** of the lower panel **26** and disposed in rolling contact with the web of the side flange **71** of the upper section **27**. A similar arrangement may of course be provided at the opposite side of the installation adjacent the lapping beams **45** and **70** of the respective panels.

A suggested means for actuating the extension and contraction of the panel **25** embodies a fluid pressure cylinder **100** which may have its rearward end pivoted to a bracket **101** secured appropriately to one of the beams **56**. A piston (not shown) is disposed for reciprocation under fluid pressure within the cylinder **100** and extending from the piston is a piston rod **105**, the outer end of the rod being connected as at **106** (see FIGURE 3) with an intersection of the bars **107** and **108** of the lazy tong structure to which the general designation **110** has been applied. The extremities at both sides of the lazy tong structure, as at **112** and **113**, are arranged for sliding movement in slots or grooves formed respectively in the cross member **118** and in a portion **120** of the beam **74**.

Thus, it will be seen that extension of the piston rod **105** will similarly extend the lazy tong structure **110** but at a multiplied rate, to bring the panels to the extended position shown in FIGURE 3. Upon the application of fluid pressure to retract the piston rod **105** the lazy tong will collapse and effect the retraction of the panel **27**.

To accommodate the piston and lazy tong structure the longitudinal end beam **57** of the panel **26** must be provided with an opening such as indicated at **125** in FIGURES 5 and 6 of the drawings. The lazy tong structure, also being connected to the outer beam **74** of the panel **27** at its lowermost point, can be accommodated within the opening **125** in both extreme positions, all as clearly shown in FIGURES 5 and 6.

It will be understood that various changes and modifications may be made in the embodiments illustrated and described herein without departing from the scope of the invention as defined by the following claims.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. A combined swimming pool cover and pool-side awning structure comprising, in combination, a cover member of a size and configuration of at least one-half the area of the pool, at least two struts pivoted adjacent the ground surface at one side of the pool at their lower ends and pivotally connected at their upper ends with said cover member at points along the line of approximate lateral center of gravity of the cover member, whereby the struts and connected cover member may be swung to and from a lower pool covering position to an elevated awning position, means fixed with respect to the ground for connection with at least one of said struts near its lower end only in the elevated position for limiting the upward swinging movement of said structure away from pool-covering position to a position a few degrees beyond the vertical, and means located closely adjacent the upper pivotal connection between the cover member and the struts and carried by one of said last named pivotally connected parts and operable to move into engagement with the other for preventing relative pivotal movement at that point while the cover member is in raised or awning position.

2. A combined swimming pool cover and pool-side awning structure comprising, in combination, a cover member of a size and configuration of at least one-half the area of the pool, at least two struts pivoted adjacent the ground surface at one side of the pool at their lower ends and pivotally connected at their upper ends with said cover member at points along the line of approximate lateral center of gravity of the cover member, whereby the struts and connected cover member may be swung to and from a lower pool covering position to an elevated awning position, means fixed with respect to the ground for connection with at least one of said struts near its lower end only in the elevated position for limiting the upward swinging movement of said structure away from pool-covering position to an approximately vertical position, and means located closely adjacent the upper pivotal connection between the cover member and the struts and carried by one of said last named pivotally connected parts and operable to move into engagement with the other for preventing relative pivotal movement at that point while the cover member is in raised or awning position, the lower pivotal connections for certain of the struts including a support fixed with respect to the ground and projecting upwardly therefrom, a pivot pin connecting an intermediate point on the support with the lower end of the strut, means for detachably securing the strut to the upper portion of the support at a point spaced from the lower end of the strut.

3. The structure as set forth in claim **1** in which said cover member comprises a primary panel to which said struts are connected as described, and a second panel carried by said primary panel and slidable therealong to and from an overlapping position where the panels are approximately conterminous and an extended position whereby the second panel projects beyond the primary panel to afford extended coverage for the pool, rollers carried by the lower portions of both of said panels to run upon the margins of the pool and other rollers carried by one of said panels to run upon the other panel during extension and retraction, one of said panels provided with side wall flanges enveloping the side walls of the other panel, and rollers rotating on vertical axles carried by one of said panels to provide anti-friction engagement between said side walls and side wall flanges.

4. The structure as set forth in claim **1** in which said cover member comprises a primary panel to which said struts are connected as described, and a second panel carried by said primary panel and slidable therealong to and from an overlapping position where the panels are approximately conterminous and an extended position whereby the second panel projects beyond the primary panel to afford extended coverage for the pool, rollers carried by the lower portion of both of said panels to run upon the margins of the pool and other rollers carried by said second panel and adapted to run upon the primary panel during extension and retraction movements, inclined ramps provided on the remote edge of said primary panel upon which said last named rollers run during relative movement of the panels, thus enabling the primary and secondary panels to occupy substantially co-planar positions when extended but return to the overlapping position upon retraction.

5. The structure as set forth in claim **1** in which said cover member comprises a primary panel to which said struts are connected as described, and a second panel carried by said primary panel and slidable therealong to and from an overlapping position where the panels are approximately conterminous and an extended position whereby the second panel projects beyond the primary panel to afford extended coverage for the pool, power means for extending and retracting the panels, said power means comprising a fluid pressure cylinder and piston device carried by the primary panel, a piston rod extending from said piston and connected by means of a lazy tong with said secondary panel.

6. The structure as set forth in claim 2 in which the lower end of said strut is bent at an angle whereby when said securing means is fastened the main portion of the strut assumes an upwardly extending angular position somewhat beyond the true vertical.

7. A combined swimming pool cover and pool-side awning structure comprising, in combination, a cover member of a size and configuration of at least one-half the area of the pool, at least two struts pivoted adjacent the ground surface at one side of the pool at their lower ends and pivotally connected at their upper ends with said cover member at points along the line of approximate lateral center of gravity of the cover member, the cover member comprising a frame constructed of beams, at least some of said beams extending transversely of the member from one side to the other of said line of approximate center of gravity, and being of a certain depth, the points of pivotal connection of the upper end of the struts being above the lower edges of the beams, and a tie bar fixedly carried by said struts and positioned at a distance below the pivot points equal to the distance of the pivot points above the lower edges of the beams, whereby said tie bar abuts the lower edges of said beams when the parts are in raised awning positions, and latching means carried by said cover member for engaging said tie bar when said raised position is reached.

8. The structure as set forth in claim 7 in which certain of the beams are arranged in pairs, the beams of each pair being parallel and close together, the upper end of a strut received snugly between the beams of said pair,

and said points of pivotal connection of said struts comprising pivot pins passing through the beams and the upper ends of the struts.

9. The structure as set forth in claim 7 in which the distance between the points of pivotal connection of the struts with the beams to the edges of the struts when in lowered position is equal to the distance between said points of pivotal connection and the lower edges of said beams, whereby in lowered position said tie bar may be brought substantially into contact with the lower edges of said beams when the struts and the cover member are both in approximately horizontal position.

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