July 9, 1968 J. R. MELBERG 3,391,410

RETAINER AND LOCK FOR SWIMMING POOL COVERS

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FIG. 1

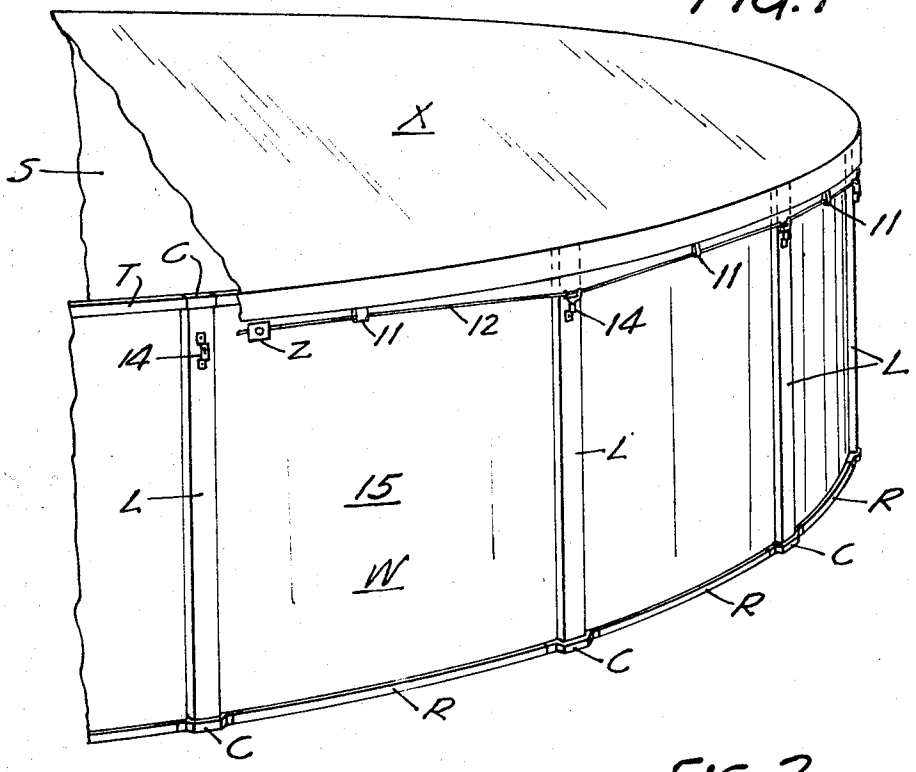
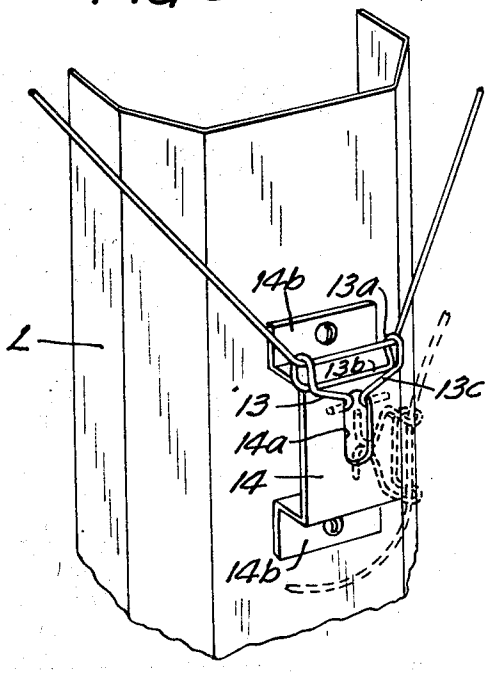
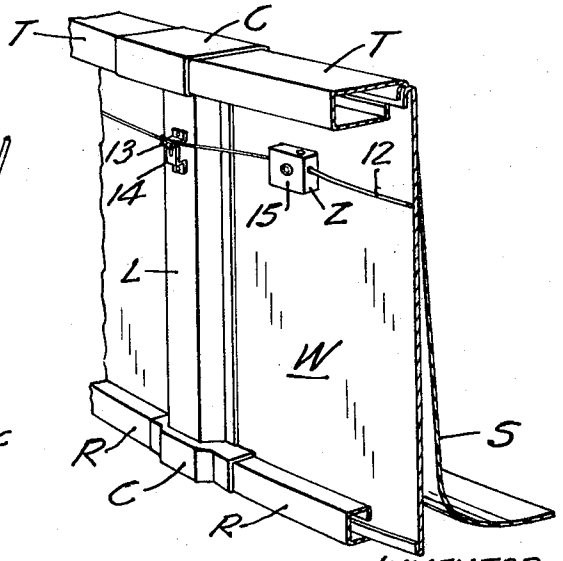


FIG. 2

FIG. 3





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FIG. 4

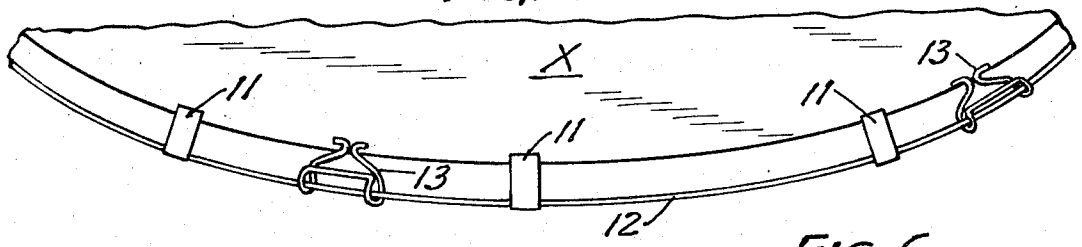


FIG. 5

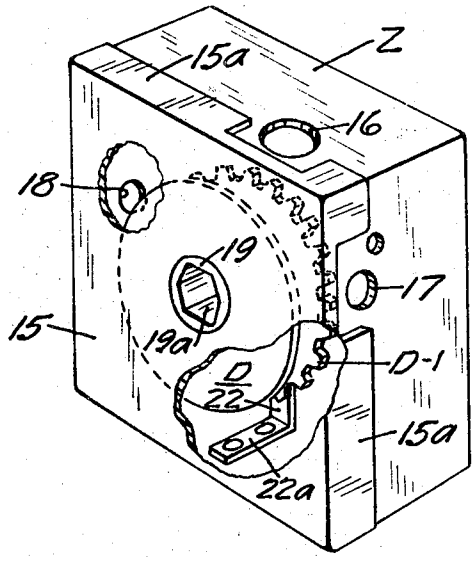


FIG. 6

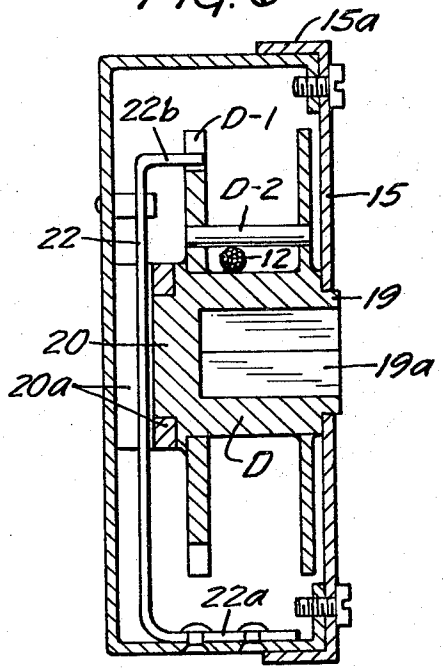


FIG. 8

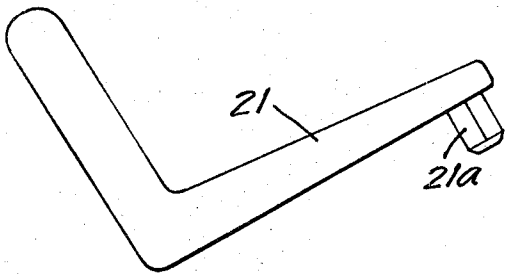
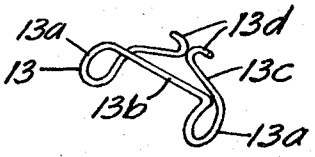


FIG. 7



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RETAINER AND LOCK FOR SWIMMING POOL COVERS

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5 Claims. (Cl. 4—172)

This invenion relates to swimming pools of the type having an upper reinforced edge of endless curve configuration, and has particular relation to a retaining and locking mechanism for a flexible tensioned cover for such pools to exclude dirt and debris.

Pools of the type for which my invention is particularly adapted are mounted on the ground for outdoor use and have a reinforcing, thin sheet metal wall upstanding from the ground, which may in various pools be arranged in several configurations such as circular, oval, figure 8 shape or kidney shape and rectangular. The pool proper, or liner, is usually constructed of a flexible plastic material such as vinyl and may be secured at its peripheral and upper edge by coping or the like to the said reinforcing wall and its circumferentially spaced legs or uprights.

An important object of my invention is to provide in connection with pools of this described type, as well as other swimming pools having an upstanding peripheral edge, a cover preferably foldable and flexible, of a shape to completely cover the top configuration of the pool and to provide with such a cover and pool, means for readily attaching and detaching said cover, and preferably tensioning the same with cooperating locking means to prevent removal of the cover from the pool in heavy winds or through theft.

A further and more specific object is the provision of pool-cover retaining and locking means which may be readily operated and applied to effectively tighten a flexible element around the upper edge of the pool with simple interconnecting means between spaced portions of the circumferential edge of the cover, and the supporting means for the pool, through a winch or lever action, and which mechanism includes a positive lock for preventing loosening or removal of said tensioned flexible element without application or use of a special key member and handle.

The preferred forms of my improved mechanism or device include a medium employing a plurality of simplified elements for imparting uniformly throughout the circumference of the pool cover, a downward and outward tensioning force to provide for a horizontal effective position of the pool cover without sumps or low spots therein.

The foregoing and other objects of this invention will be more apparent from the following description made in conjunction with the accompanying drawings wherein like reference characters refer to similar parts throughout the several views and in which:

FIG. 1 is a fragmental perspective view of a typical outdoor swimming pool of the general construction previously referred to, having a protective cover operatively applied thereto and tensioned thereon, and locked in tensioned position through employment of my improved mechanism;

FIG. 2 is a fragmentary perspective view on a somewhat larger scale, showing the general structure of the pool, its wall and supports, and the pool proper or liner, with a cover tensioned and operatively positioned thereon and locked in place through my improved construction;

FIG. 3 is a detail perspective view showing one suitable construction for detachably connecting a flexible encircling member with one of the circumferentially spaced supporting legs for the reinforcing wall of the pool;

FIG. 4 is a fragmentary plan view showing a portion of the marginal edge of the cover with its retaining loops for receiving the tensionable encircling element and the hook-type attachments for interlocking the flexible element with the reinforcing construction of the pool at circumferentially spaced points around the pool;

FIG. 5 is a perspective view looking towards the right hand edge of the combination tensioning and locking device constituting a part of my novel combination, with some portions broken away and with one end of the encircling flexible element being initially inserted therein;

FIG. 6 is a vertical section taken transversely through the housing of the combined lock and tensioning device;

FIG. 7 is a perspective view showing a satisfactory type of retainer or hook to interconnect with freedom for tensioning and sliding movement of the flexible member, such member with one of the legs or reinforcing portions of the swimming pool; and

FIG. 8 is a detail perspective view showing a combined key and crank handle for actuating and also releasing the tensioning element or winch of the device.

While my improved cover-retaining and locking mechanism is readily applicable to swimming pools varying widely in structure which do have upwardly extending peripheral edges, in the accompanying drawings, it is applied to an outdoor swimming pool of the type manufactured and sold by Doughboy Industries, Inc., (my assignee) which as shown in FIG. 2, employs a corrugated steel standing circumferential wall W, fitting into and connected with sectional rail channels R at the bottom thereof, and with sectional rail channels T at the top thereof. In the particular and exemplary pool structure illustrated lower and upper rail channels of sectional lengths, are interconnected by connectors C (at both top and bottom) which also are rigidly interconnected with upstanding reinforcing legs L.

The top and bottom rail sections R and T, the connectors and legs may be made of metal channel construction or could be made of other building materials including composition, plastic, wood or the like.

The swimming pool proper or liner S, as shown, is made from a readily foldable, soft, water-impervious material such as vinyl plastic, which remains pliable at extreme temperatures and which contains a stabilizer to prevent shrinkage or substantial stretching.

The cover for the pool, indicated as an entirety by the letter X, may be made of any suitable, durable and pliable flexible material, preferably having little stretchability and either in netting form, or preferably of a rather tightly woven monofilament mesh. Textiles may be used but woven monofilament plastic is preferred so that it will not absorb rainfall. It may be made up of heat-sealed section or integral woven fabric and is of the top plan configuration of the pool.

As shown, see bottom plan fragmentary view FIG. 4, the circumferential marginal edge of the cover X is provided with a multiplicity of radial loops **11** which may be of flexible plastic or woven textile construction, constituting hem sections through which an elongated flexible encircling element **12** is threaded for use. The encircling element **12** may constitute a small rope (preferably plastic) or a multi-strand nylon rope, or even a very light cable of small diameter.

Media are preferably provided at circumferentially spaced points for interconnecting exposed portions of the flexible element **12** with rigid parts of the circumferential outer reinforcing wall of the pool, spaced a short distance below the upper peripheral edge of the pool for tensioning purposes. While various attachment media may be em-

ployed, a simple construction which is preferred, as illustrated in FIG. 3 and FIG. 4, comprises a series of double hooks **13** bent in general U-shape formation to provide a pair of spaced slide loops **13***a*, said loops being interconnected by the rod **13***b* constituting the bottom of the U and having inwardly converging hooks **13***c* which terminate as shown in FIG. 3, in outwardly and oppositely extending hook extremities. Hooks **13** are preferably made of a metal having spring characteristics, so that the two hooks **13***c* may be pressed together for insertion of the hook extremities into the vertical slot **14***a* of an anchoring member **14**, one of which is secured to a predetermined leg or position on the circumferential pool-supporting structure. Anchoring members **14** are shown in the form of metal brackets, each having a spaced pair of attachment legs **14***b* which may be secured to drilled holes in one of the pool legs L, preferably some distance from the top thereof and from the top rails T. Hooks **14** may be inserted, as shown in the dotted lines in FIG. 3, disposed vertically, whereafter the hook is turned through 90° to dispose the loops in horizontally aligned relationship shown in full lines of FIG. 3.

The flexible encircling element **12** is of course of adequate length to somewhat more than surround and encircle the entire upper perimeter of the pool, by for example, five or six feet. One end of this flexible element **12** is preferably first connected with the housing or frame structure of a combined tensioning and locking device indicated as an entirety by the letter Z, the housing thereof as shown, being of rectangular shell construction with an outer cover plate **15** interfitted therewith and permanently connected at flanges **15***a* by welding or other suitable uniting means.

The combined tensioning and locking device in use can be rigidly attached to one of the upstanding legs L, but may be well employed as a separate mechanism independently of the legs or other pool-supporting structure, held in its ultimate position by the tensioning of the cable or endless element **12**.

As shown in FIG. 5 and other views, the device Z at its upper right hand corner, has a relatively large aperture **16** for receiving by downward threading, one end of the cable **12** which is preferably projected through the right hand vertical wall near the top of the housing, to a smaller aperture **17** of very slightly larger diameter than flexible element **12**. The entire length of the endless tensioning element **12** may be passed through the smaller aperture and circumferentially disposed about the top of the pool and the rear end thereof is knotted or otherwise enlarged to pass through the larger top opening **16** and to be of such size that the enlargement may not pass through the smaller side aperture, thereby firmly securing the tensioning member to the housing Z.

With the flexible element **12** loosely surrounding the upper flange of the pool, the unfastened or first mentioned end of cable **12** is passed through the opening **18** on the left hand vertical edge of the housing Z and is projected snugly beneath a horizontal retaining pin D–2 (see FIG. 6) of a winding drum D which also carries a multiplicity of radial teeth D–1. Winding drum D has forward and rearwardly projecting trunnions **19** and **20** which are suitably journaled in bearings provided respectively by a bracket **20***a* secured to the outer cover plate **15** and the rectangular inner wall of the shell Z. Forward trunnion **19** is recessed at **19***a* in a predetermined manner, shown as hexagonal to receive the specially shaped key or crank shaft **21***a* of a winding handle **21**. Key shaft **21***a* is of sufficient length to permit, by inward pressure, extension of its extremity past normal operating position, as will be hereafter more fully explained.

As a part of the tensioning and locking mechanism Z, the releasable means are provided for retaining and locking the winding drum in its numerous 360° winding operation and to nevertheless, with power from the crank handle, enable the winding drum or winch to be progressively turned. Means illustrated comprises a resilient locking finger **22** which extends vertically at the rear side of the locking drum D, and as shown, has an angular attachment foot **22***a* secured to the bottom horizontal side of the housing of the device Z. At the upper end of finger **22**, an inturned pawl or tooth **22***b* is provided, dimensioned to loosely fit between the teeth D–1 of the drum, but with substantial torque power applied by the crank handle, to permit progressive slipping over of the pawl by the teeth D–1. The central portion of the upstanding finger **22** is aligned with the recess made in the trunnion and extending entirely through the winding drum D so that when the crank handle **21** is applied with the crank shaft or key **21***a*, and a force is pressed inwardly, axially of the drum, the finger is forced rearwardly to a position where its pawl **22***b* is entirely released from the teeth of the drum. Thus when it is desired to release the tensioned cable or endless member **12**, after the device is fully tensioned, inward force may be put upon the key shaft and the drum released in counter-clockwise direction by the crank handle.

The shape-area of the cover (unfolded) is such before tensioning as to cover the top of the pool.

The cable or endless element **12**, strung through the said loops or hem elements **11** and with the knotted or enlarged end thereof secured to the housing of the combined tensioning and locking device Z thus surrounds the upper peripheral edge of the pool in loose fashion. After this arrangement is effected the series of double hooks **13** are connected with the uncovered portions of the flexible element **12** and are progressively secured to the anchoring members **14** affixed to the respective legs or other rigid portions of the upstanding reinforcement wall for the pool. Thereafter the free end of the flexible encircling element **12** is threaded through the aperture **18** on the left corner of the housing Z where the cable will be engaged by the respective teeth or pins D–1 of the winding drum. Thereafter the crank handle **21** is operatively applied by insertion of the specially cross sectioned shape of the shaft **21***a* with the socket **19***a* of the mechanism Z. Turning of the crank handle **21** in clockwise direction, progressively winds the flexible element **12** upon the drum or reel D, the circumferential teeth being progressively retained by the pawl **22***b* of the resilient locking finger.

During the tensioning action of element **12**, the cover is quite uniformly tensioned radially outwardly thereof due to the fact that the circumferentially spaced hooks **13** are anchored in the anchoring members **14**, at a distance several inches below the upper peripheral edge of the pool. Thus when tensioned, the cover will actually slightly overlap the upper peripheral edge of the pool as shown in the bottom plan view, FIG. 4.

When the cover is thus operatively attached and tensioned by the combinative functions of the tightening mechanism and cable element **12**, the crank handle with driving shaft is detached from the device and the cover is locked against displacement by high winds or theft.

When it is desired to remove the cover, crank handle **21** is repositioned in socket **19***a* and the operator with one hand applies an inward force on the key shaft **21***a* thus releasing the locking pawl **22***b* from its locked engagement with the teeth D–1 of the drum. Cable element **12** may then be slacked off by slight unwinding of the reel to an extent where it very loosely surrounds the upper peripheral edge of the pool. To remove the cover the hooks **13** are progressively detached from their respective anchoring brackets **14** and the cover, with flexible member and lock still applied thereto, may be slipped over the top of the pool and properly folded for storage in compact form.

From the foregoing it will be seen that a highly efficient, economical and readily applied combination attachment and locking device has been provided for swimming pool covers which is adapted for wide and various uses on swimming pools of a variety of shapes and sizes.

My attachment and device may be readily applied to conventional pool covers and outdoor swimming pools and the like without skilled help and without the use of additional tools other than the actual elements supplied by the swimming pool cover and the cooperating elements of my structure.

It will of course be understood that various changes may be made in the form, details and arrangement of parts as well as equivalencies of the specific form disclosed herein, all without departing from my invention.

What is claimed is:

1. An attachment device and lock for swimming pool covers having in combination with the upstanding peripheral edge of a swimming pool,

means adjacent the peripheral edge of a swimming pool cover for receiving an elongated, flexible retaining element, said element in use encircling said upstanding edge of the pool,

a combination take-up and locking mechanism for said flexible element comprising an element-receiving housing,

a progressively movable tensioning member in said housing with which one end of said element is connected, the other end of said element being affixed in a predetermined position somewhat below the upper peripheral edge of the pool,

a power arm for driving said progressively movable member,

a locking latch within said housing for locking engagement with said member to retain the same against release, and

means removable from said locking mechanism for disengagement of said locking latch.

2. The structure set forth in claim 1 wherein the said tensioning member is in the form of a winding drum rotatively mounted within said housing and wherein said power arm constitutes a crank having a shaft section detachably connectible axially with said drum.

3. The structure set forth in claim 1, and a plurality of detachable hook elements for surrounding exposed portions of said flexible retaining element and a corresponding number of hook-anchoring elements affixed to circumferentially spaced portions of the pool supporting structure and disposed below the upper peripheral edge of the same for detachable connection with said hook elements whereby tensioning of said flexible element also causes outward radial and downward pull of the marginal edge of said pool cover.

4. A securing device and lock for swimming pool covers having in combination

means adjacent the peripheral edge of a pool cover for receiving an elongated flexible retaining element of a length to surround the upstanding edge of a pool,

rigid media around the peripheral edge of the pool for receiving and connection with said flexible element,

a combination take-up and locking mechanism for said flexible element comprising a housing mounted upon a rigid portion of the periphery of said pool structure,

a winch element mounted in said housing and having an axial drive-engage element for connection with a crank handle through an aperture in said housing,

said winch including a rotary reel mounted within said housing having means thereon for attachment of one end of said flexible element,

a ratchet lock plate within said housing for permitting winding of said reel in one direction and locking of said reel against unwinding,

a clutch device urging said reel into driving engagement with said crank engaging element, and

a specially shaped key-receiving aperture disposed in opposed relation to a clutch releasing element.

5. The structure set forth in claim 4 wherein said rigid media for connection with said flexible element comprises a plurality of circumferentially spaced attachment brackets affixed to the periphery of the pool-supporting medium at a distance below the upper periphery of the pool, and

a similar number of connector elements surrounding exposed portions of said flexible elements and having detachable connection at their outer ends with said attachment brackets.

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