April 1, 1941. S. G. STRATTAN 2,237,202

LIGHT TOWER

Filed April 25, 1939 3 Sheets-Sheet 1

Fig. 1.

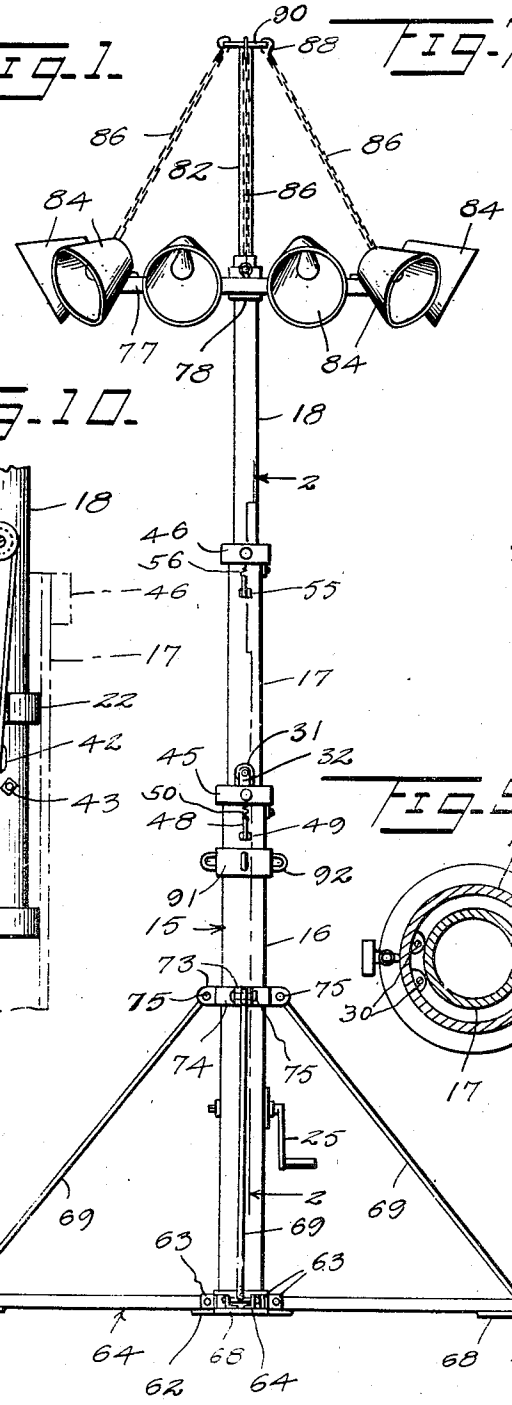


Fig. 10.

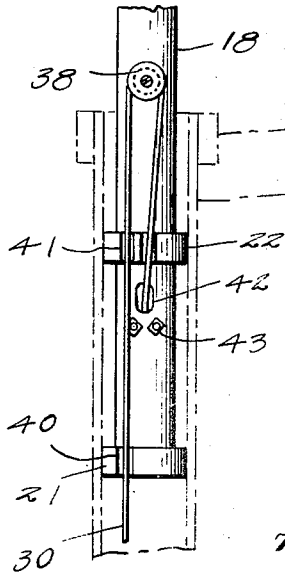


Fig. 7.

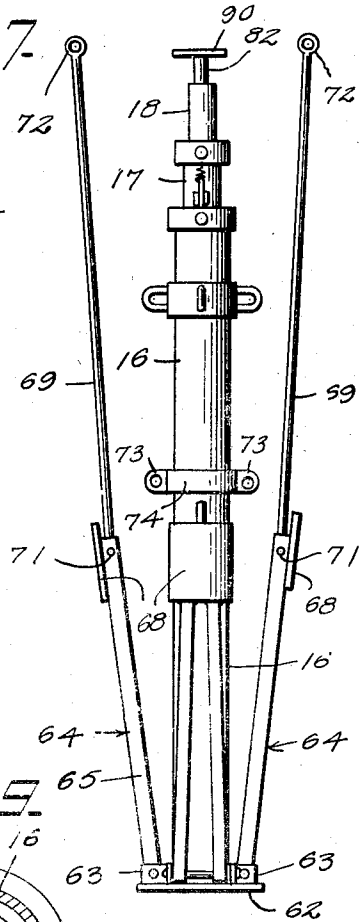
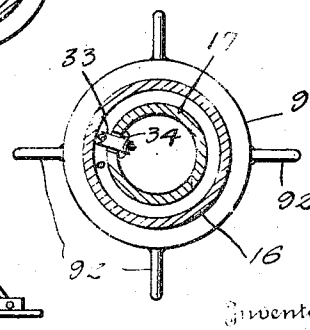


Fig. 9.

Fig. 8.



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April 1, 1941. S. G. STRATTAN 2,237,202

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Filed April 25, 1939 3 Sheets-Sheet 2

Fig. 2.

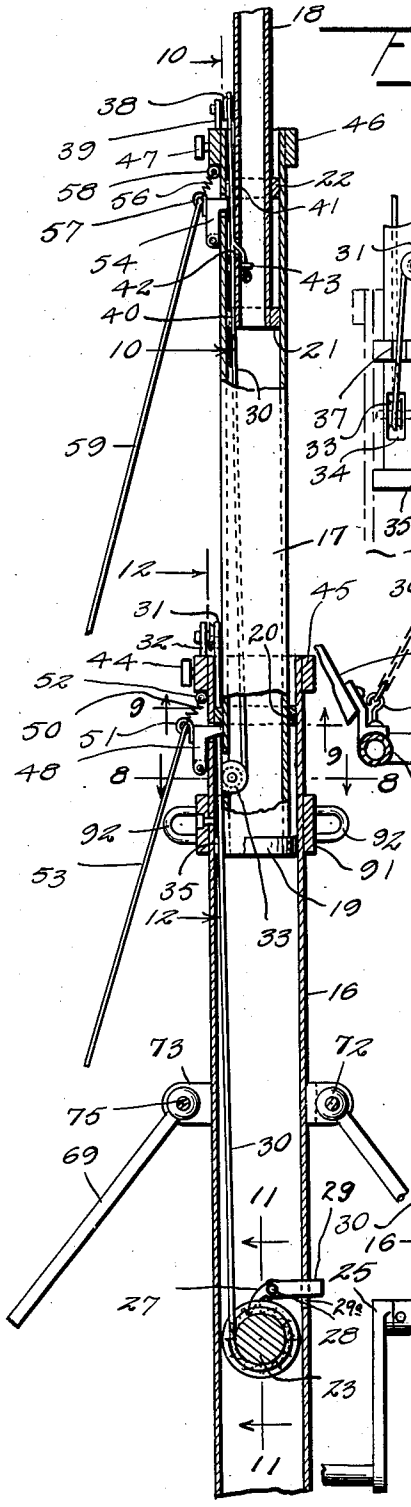


Fig. 12.

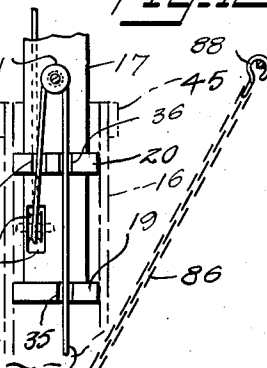


Fig. 3.

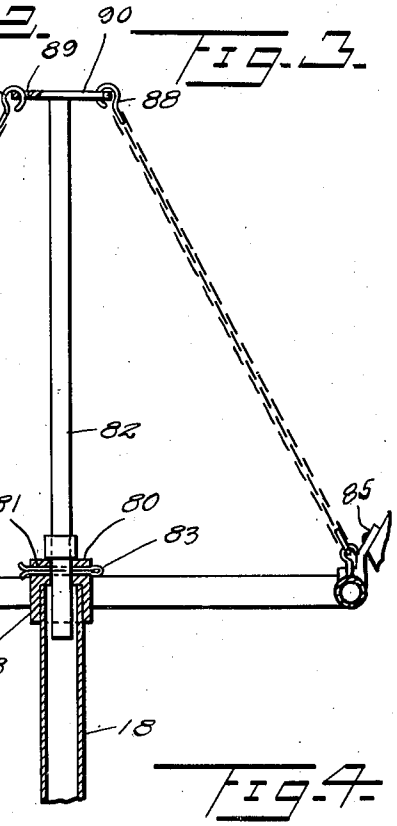


Fig. 4.

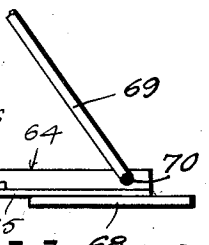
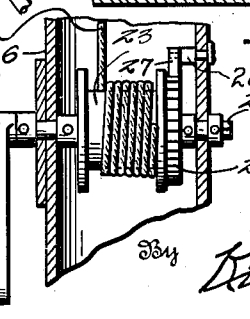


Fig. 11.



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April 1, 1941. S. G. STRATTAN 2,237,202

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Filed April 25, 1939 3 Sheets-Sheet 3

Fig. 5.

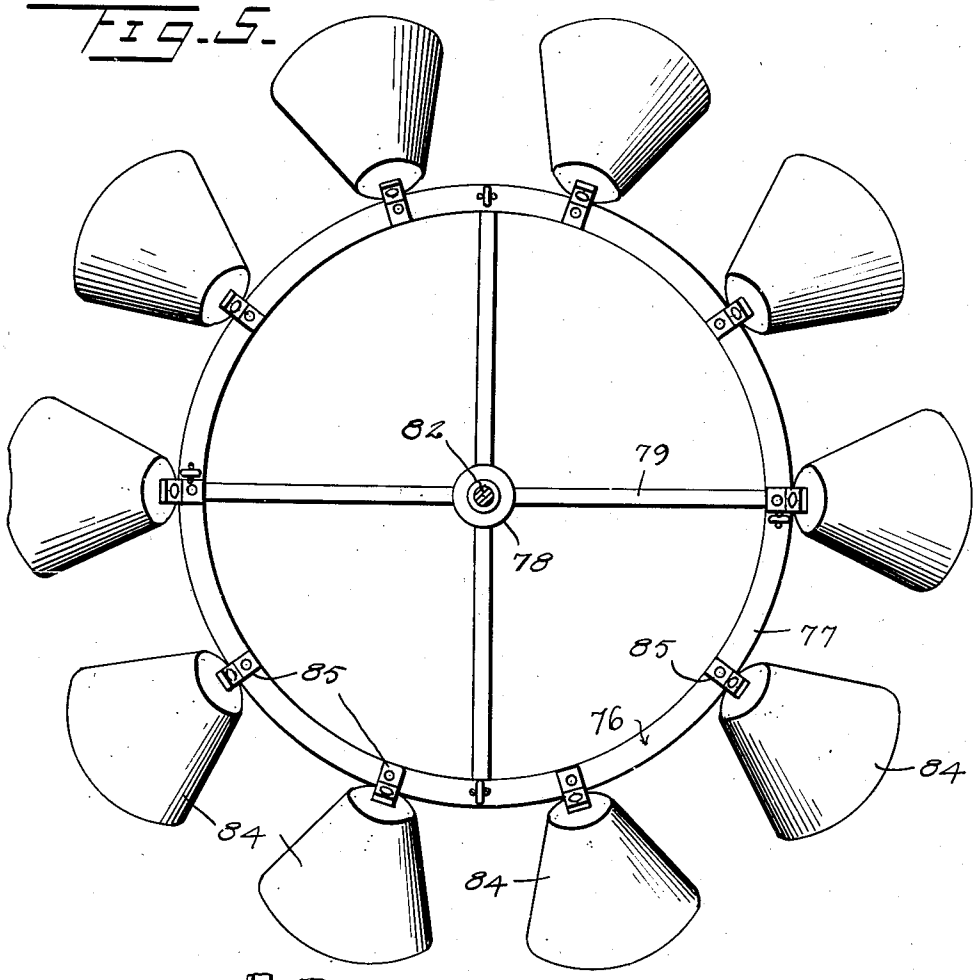
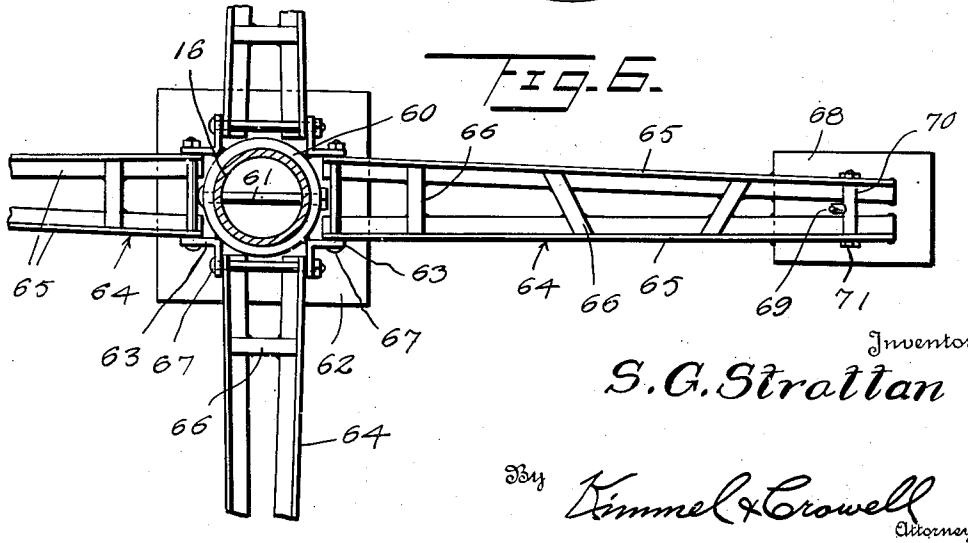


Fig. 6.



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Patented Apr. 1, 1941

2,237,202

UNITED STATES PATENT OFFICE

2,237,202

LIGHT TOWER

Sibert G. Strattan, Mount Vernon, Ill.

Application April 25, 1939, Serial No. 270,033

3 Claims. (Cl. 254—148)

This invention relates to light towers and more particularly to a collapsible light tower.

An object of this invention is to provide a standard or tower of a collapsible construction which may be raised or lowered by a winding device carried by one of the telescoping sections, the device including not only a collapsible standard but also a collapsible base structure.

Another object of this invention is to provide a tower of this kind which can be easily and quickly raised, the device including a collapsible base which may be connected to the standard by collapsible or removable brace members.

A further object of this invention is to provide a stand or tower of this kind which is provided with releasable locking members adapted to hold the telescoping sections in extended position so as to relieve the elevating means of the strain of supporting the stand sections in elevated or extended position.

To the above objects and to others which may hereinafter appear, the invention consists of the novel construction, combination and arrangement of parts as will be more specifically referred to and illustrated in the accompanying drawings, wherein is shown an embodiment of the invention, but it is to be understood that changes, modifications and variations may be resorted to which fall within the scope of the invention as claimed.

In the drawings:

Figure 1 is a detail side elevation of a tower constructed according to an embodiment of this invention showing the tower in fully extended position,

Figure 2 is a fragmentary sectional view taken on the line 2—2 of Figure 1,

Figure 3 is an enlarged fragmentary vertical section partly in elevation of the light supporting portion of the tower,

Figure 4 is an enlarged fragmentary vertical section of the lower portion of the tower,

Figure 5 is a horizontal section of the upper portion of the tower,

Figure 6 is a fragmentary horizontal section of the lower portion of the tower in extended position,

Figure 7 is a detail side elevation of the tower in collapsed position,

Figure 8 is a sectional view taken on the line 8—8 of Figure 2,

Figure 9 is a sectional view taken on the line 9—9 of Figure 2,

Figure 10 is a sectional view partly in elevation taken on the line 10—10 of Figure 2,

Figure 11 is an enlarged fragmentary sectional view taken on the line 11—11 of Figure 2, and

Figure 12 is a fragmentary sectional view taken on the line 12—12 of Figure 2.

Referring to the drawings, the numeral 15 designates generally a standard comprising a stationary lower section in the form of a tubular member 16, a shiftable intermediate section in the form of a tubular member 17 and a shiftable upper section in the form of a tubular member 18. The member 16 is of larger diameter than the member 17. The latter is of larger diameter than the member 18. The member 17 telescopes into the member 16. The member 18 telescopes within the member 17. The member 17 is extendible with respect to the member 16 and the member 18 is extendible with respect to the member 17. The member 17 is provided at its lower end with a ring 19 which is fixed to the periphery of the tubular member 17 and is adapted to slidably engage the inner surface of the lower member 16. A second ring 20 is fixed to the tubular member 17 at a point upwardly from the lower ring 19 and these two rings 19 and 20 constitute guide means for slidably supporting the intermediate member 17 in the lower member 16.

The member 18 is provided adjacent its lower end with a guiding ring 21 which is fixed to the tubular member 18 and a second guiding ring 22 is fixed to the tubular member 18 upwardly from the lower ring 21.

The stationary member 16 is provided on the interior thereof at a point upwardly from the lower end with a winding drum 23 which is secured to a shaft 24 extending diametrically across the lower member 16 and projecting outwardly thereof. A crank 25 is adapted to be removably engaged with either end of the shaft 24, the projecting ends of the shaft 24 being provided with squared faces for engagement with a nut socket carried by the crank 25. The drum 23 at one side thereof is provided with a ratchet 26 and a pivoted pawl 27 is adapted to engage the ratchet 26. The pawl 27 is mounted on a shaft 28 and a handle 29 projects exteriorly of the member 16 through a slot 29a so that the pawl 27 may be readily held in a released position to permit collapsing of the standard sections 17 and 18 into the lower standard section 16. An elevating cable or flexible member 30 is wound about the drum 23 and extends upwardly within the tubular member 16, being trained over a pulley or

sheave 31 which is carried by a bracket supporting member 32 fixed to the upper end of the lower member 16. A pulley or sheave 33 is rotatably carried by the intermediate section or member 17 adjacent the lower end thereof which projects through an opening 34 provided in a wall of the member 17.

The elevating cable 30 is extended downwardly from the pulley or sheave 31 and then trained about the pulley 33 and from there extends upwardly into the interior of the intermediate section 17. The ring 19 carried by the intermediate section 17 is provided with a slot or recess 35 through which the cable 30 extends and the ring 20 is provided with a similar slot or recess 36 through which the cable 30 extends. The ring 20 may also be provided with a second slot 37 spaced from the slot 36 so that the run of the cable from the pulley 31 to the pulley 33 may freely pass the ring 20. The upper end of the intermediate section or member 17 is provided with a pulley 38 rotatably carried by a bracket or bearing member 39 and the cable 30 extends upwardly from the pulley 33 on the outside of the upper member 18. The ring 21 is provided with a slot or groove 40 through which the cable 30 extends and the ring 22 is provided with a slot or groove 41 in which the cable 30 is slidable. The cable 30 is extended downwardly from the pulley 38 on the outside of the upper section or member 18 and is then passed through an opening 42 provided in the upper section or member 18 between the two rings 21 and 22. The cable 30 is then anchored or fixed to the upper section or member 18 by clamping means 43. Through an elevating construction of this kind winding of the cable 30 on the drum 23 will simultaneously raise the two sections 17 and 18 to an extended position. The stationary lower section or member 16 adjacent the upper end thereof is provided with a set screw 44 which extends through a reinforcing ring 45 provided on the upper end of the lower member 16 and this set screw 44 is adapted to engage the upper ring 20 of the intermediate section 18 so as to prevent complete removal of the intermediate section 17. The intermediate section or member 17 is provided at the upper end thereof with a reinforcing ring 46 through which a stop member 47 in the form of a set screw is adapted to engage. The set screw or stop member 47 is adapted to project into the interior of the intermediate section or member 17 and engage the upper ring 22 of the upper member 18 so as to prevent complete withdrawal of the upper member 18.

The stationary lower section or member 16 at a point adjacent the upper end thereof is provided with a spring-pressed holding dog 48 which is mounted between a pair of ears 49 fixed to the stationary lower section or member 16. A spring 50 is secured at one end to an eye 51 carried by the dog 48 and at the other end to an eye 52 which is fixed to the reinforcing ring 45. A releasing cord 53 is secured at one end to the eye 51 and extends loosely downwardly on the outer side of the stationary lower section or member 16 so that the dog 48 may be swung to a released position to permit collapsing of the intermediate section or member 17. The dog 48 when in operative position is adapted to engage beneath the upper ring 20 so as to support the intermediate section or member 17 in its extended position. The intermediate section or member 17 at a point adjacent the upper end thereof is provided with a holding dog 54 which is rockably mounted between a pair of ears 55 fixed to the exterior of the intermediate section or member 17. The dog 54 is constantly urged to a locking position by means of a spring 56 which at one end engages an eye 57 carried by the dog 54 and at the other end engages an eye 58 fixed to the reinforcing ring 46. The dog 54 is adapted to engage beneath the upper guiding ring 22 carried by the upper section or member 18. A releasing cord 59 is secured at one end to the eye 57 and extends loosely downwardly on the exterior of the standard.

The stationary lower section or member 16 has secured thereto a ring or sleeve 60 by means of a bolt or fastening member 61. A base plate 62 is welded or otherwise fixed to the lower end of the sleeve 60 and a plurality of L-shaped angle members 63 are secured to the sleeve 60 and also to the base plate 62. A plurality of collapsible base members or legs generally designted as 64 are pivotally secured between each pair of angle members 63. The legs or base members 64 each comprises a pair of oppositely disposed elongated angle members or bars 65 extending inwardly at an inclination from their inner to their outer ends and which are held in spaced apart relation by means of connecting bars 66. The connecting bars or braces 66 are welded between each pair of angle members 65. A bolt 67 extends through one leg or side of each angle member 65 and through a pair of angle members 63 so as to pivotally secure the inner ends of the base or supporting members 65 to the angle members 63. A shoe or plate 68 is secured to the outer ends of each pair of angle members 65 being preferably welded to the lower horizontal side of each angle member 65.

In the present instance, there are four of the base legs 64 and these legs 64 are held in a substantially horizontal extended position by means of brace members 69 in the form of elongated rods provided at their lower ends with a right angularly disposed tubular member 70. A bolt 71 extends through the vertical side of each angle member 65 and through the tubular bracing portion 70 at a point adjacent the outer ends of the angle members 65. The upper end of each brace 69 is provided with an eye 72 which is adapted to engage between a pair of ears 73 fixed to the lower standard member 16. A band 74 is welded or otherwise fixed to the outside of the lower member 16 and the opposite ends of the band 74 are bent outwardly forming the ears 73. There are four of these bands 74 secured circumferentially about the lower member 16 at a point upwardly from the lower end thereof. A bolt or fastening member 75 extends through the ears 73 and through the eye 72 so as to releasably hold the upper ends of the bracing members 69 in operative position.

A light supporting bracket generally designated as 76 is mounted on the upper end of the upper section or member 18 and comprises a ring or annular member 77, a hub or sleeve 78 and radially disposed spokes 79 connected to the hub or sleeve 78 and the annular member 77. The sleeve 78 is adapted to loosely engage over the upper end of the upper member 18 and is provided with a top wall 80 having an opening 81 through which an upwardly extending bar 82 removably engages. The top wall 80 of the sleeve 78 is adapted to engage on the upper end of the tubular member 78 and the bar 82 is adapted to extend downwardly through the opening 81 and may be locked by means of a cotter pin or other fastening member 83. A plurality of circum-

ferentially spaced apart reflectors 84 are secured to bracket members 85 fixed to the annulus 77 and are inclined downwardly so as to project light rays downwardly and outwardly from the tower.

Preferably, these reflectors 84 are of frusto-conical configuration. A plurality of chains 86 are connected to hooks 87 which are fixed to the annulus 77 and the upper ends of the chains 86 are provided with hooks 88 engaging in openings 89 provided in a top plate 90 which is fixed to the upper end of the bar 82.

The stationary lower section or member 16 at a point adjacent the upper end thereof is provided with a sleeve 91 provided with a plurality of outwardly extending eyes or loops 92. These loops 92 are adapted to receive towing or fastening devices so as to permit mounting of the collapsed tower on a wheeled truck or trailer and then connecting a pulling cable to the eyes or loops 92.

In the use and operation of this tower, the tower is initially set up from a collapsed position similar to that shown in Figure 7 by connecting the braces 69 with the outer ends of the base legs 64 and with the ears 73. The drum 23 may then be rotated by means of the crank 25 so as to pull the intermediate section 17 and the upper section 18 upwardly. As the ring 20 of the intermediate section 17 passes the dog 48, the dog 48 will engage beneath the ring 20 so that the intermediate section or member 17 will thereby be held against downward movement. At the same time the ring 22 passes the dog 54 and this dog 54 engages beneath the ring 22 and holds the upper section or member 18 against downward movement. Prior to the movement of the telescoping sections 17 and 18 to an extended position the light supporting member 76 may be mounted on the upper end of the upper or section member 18. The sleeve 78 may be fixed in any suitable manner to the upper end of the upper or section member 18 so that the light supporting member 76 will not be free to rotate on the upper or section member 18.

When it is desired to collapse the tower, the releasing cords 53 and 59 may be pulled downwardly so as to swing the dogs 48 and 54 to a released position. The dog 27 may also be swung to a released position by means of the handle 29. The drum 23 may then be rotated to unwind the cord or cable 30 and thus permit the telescoping standard sections 17 and 18 to gravitatingly move downwardly to a collapsed position. A light tower constructed according to this invention can be easily and quickly mounted in any suitable location and the base members 64 are of sufficient length so as to prevent tipping over of the tower under the action of any wind. If desired, suitable anchoring means may be provided to prevent the tower from tipping over under substantially high winds. The upper ring of each pair of rings constitutes an abutment. The dogs 48, 54 in connection with the releasing cords 53, 59 respectively provide what may be termed latching elements which coact with the rings providing the abutments.

What I claim is:

1. A collapsible tower comprising a base, a lower tubular member rising from said base, an intermediate tubular member slidable in said lower member, an upper tubular member slidable in said intermediate member, a winding drum carried by said lower member, a flexible member engaging about said drum, a sheave rotatably carried by said lower member above the upper end thereof, a sheave rotatably carried by and disposed within said intermediate member in proximity to the lower end of the latter, a sheave rotatably carried by said intermediate member above the upper end thereof, means fixedly securing one end of said flexible member to said upper member, said flexible member being trained about each of said sheaves whereby rotation of said drum in one direction will move said intermediate and upper members to an extended position, and a pair of spaced apart guiding rings fixed on the outer peripheries of said intermediate and upper members.

2. A collapsible tower comprising a base, a lower tubular member rising from said base, an intermediate tubular member slidable in said lower member, an upper tubular member slidable in said intermediate member, a winding drum carried by said lower member, a flexible member engaging about said drum, a sheave rotatably carried by said lower member above the upper end thereof, a sheave rotatably carried by and within said intermediate member in proximity to the lower end thereof, a sheave rotatably carried by said intermediate member above the upper end of the latter, means fixedly securing one end of said flexible member to and within said upper member, said flexible member being trained about each of said sheaves whereby rotation of said drum in one direction will move said intermediate and upper members to an extended position, and a pair of spaced apart guiding rings fixed on the outer peripheries of the said intermediate and upper members, each of said guiding rings having at least one groove through which said flexible member is adapted to slidably engage.

3. A collapsible tower comprising a base, a standard rising upwardly from said base and formed of a stationary lower section secured to the base, a tubular intermediate section disposed in telescopic relation with respect to said lower section and a tubular upper section disposed in telescopic relation with respect to said intermediate section, a flexible winding element, said stationary and intermediate sections provided with means for respectively slidably connecting said element to and over the top of said stationary section, to and within the intermediate section adjacent the lower end of the latter and to and over the top of said intermediate section, said element extending into said upper section through the lower portion of the body of the latter, means within the upper section for anchoring the upper end of said element to said upper section in proximity to the bottom of the latter, and a latchable revoluble winding means for said element arranged in the said lower section and providing on the revolving thereof in one direction for said element to extend said intermediate section upwardly with respect to said lower section and to extend said upper section upwardly with respect to said intermediate section.

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