

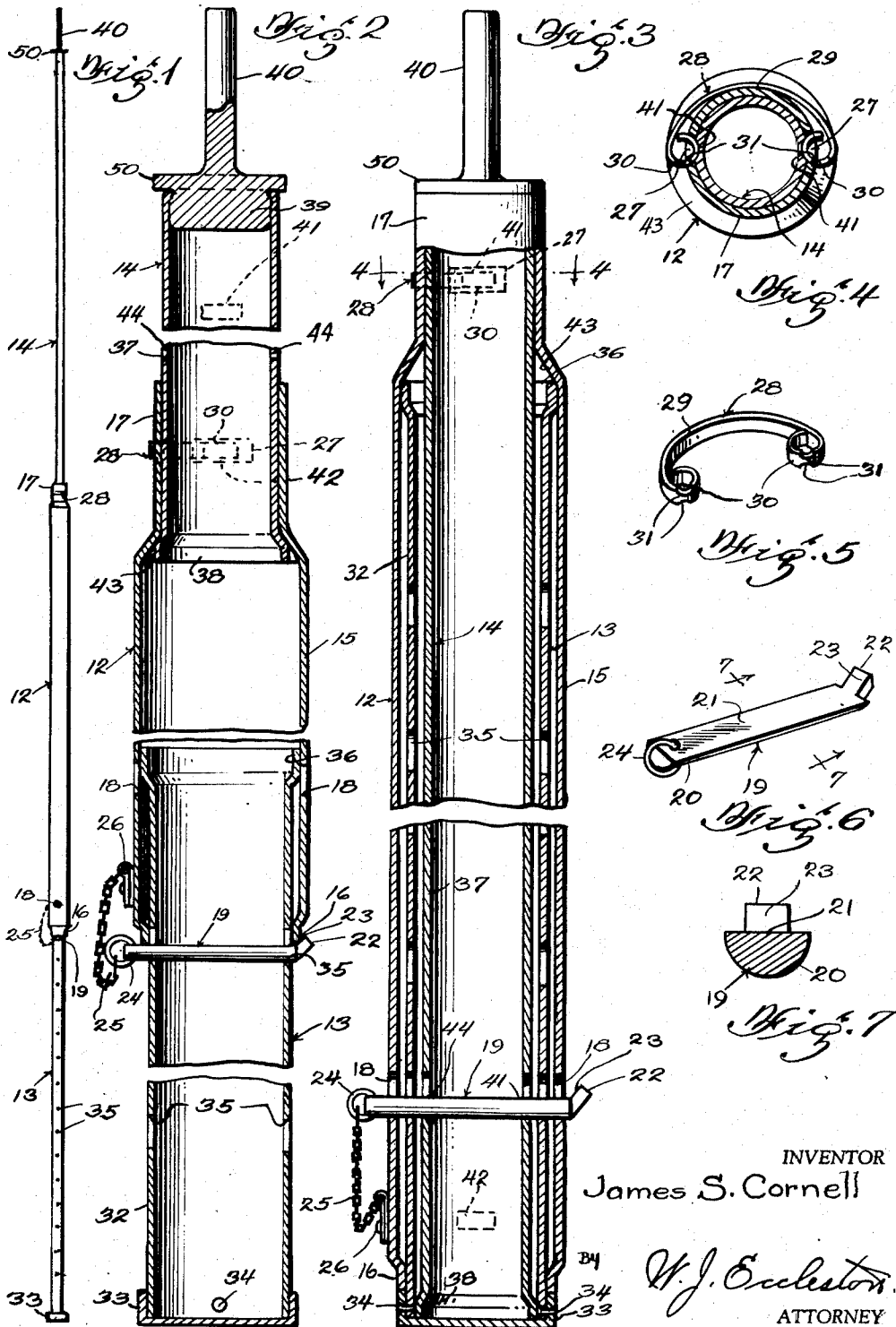
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TELESCOPIC STRUCTURE

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TELESCOPIC STRUCTURE

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The invention described herein, if patented, may be manufactured and used by or for the Government for governmental purposes, without the payment to me of any royalty thereon.

My invention relates to telescopic structures and more particularly to telescopic pole or rod structures, together with novel means for locking the sections of the pole or rod in either or both of the extended and collapsed positions.

Structures of the nature of that contemplated by the invention are well known and have many uses. All of such structures provide some means for locking the sections in either or both of the extended or collapsed positions.

However, known locking or latching means are usually subject to many objections and frequently are incapable of operating under all weather or temperature conditions without excessive breakage. Many are incapable of being actuated by gloved personnel which is an important consideration in cold climates. Most such means are permanently connected to the parts and cannot be replaced except by skilled personnel using special tools.

While the particular structure disclosed hereinafter is intended for use as a tent pole, it is obviously capable of other uses within the scope of the invention as hereinafter claimed. The particular structure of the invention is intended to be formed of light weight tubular material whereby to provide the maximum strength with a minimum of weight and to provide improved means for retaining the sections in either or both of the extended and collapsed positions.

With the foregoing in view it is an object of my invention to provide an improved telescopic structure of the class described.

A further object is to provide in such a structure, improved means for locking the sections in either or both of the extended and collapsed positions.

A further object is to provide in such a structure, improved spring latch means for locking the sections in either or both of the extended or collapsed positions, such means being of simple structure and being capable of ready replacement by unskilled personnel upon breakage without the use of special tools.

A further object is to provide at least a pair of tubular sections slidably and rotatably connected together for telescoping movement, a pair of oppositely disposed holes in one section adjacent one end thereof, pairs of recesses in the other section adjacent both ends thereof, and a novel spring latch carried by the first-named section

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and projectable through said holes and into said recesses with said sections in an extended position and/or in a collapsed position whereby to lock said sections in such positions.

A further object is to provide in combination with a pair of tubular sections slidably connected together for telescoping movement, an improved locking or adjusting pin insertable through transversely aligned holes in one section when said sections are extended so as to engage the adjacent end edge of the other section and limit collapsing movement of said sections.

Other objects and advantages reside in the particular structure of the invention, the structure of the several elements thereof, combinations and sub-combinations of such elements, all of which will be readily apparent to those skilled in the art upon reference to the attached drawing in connection with the following specification wherein the invention is shown, described and claimed.

In the drawing:

Figure 1 is an elevation on a reduced scale of the invention, the parts being shown in an extended position;

Figure 2 is a longitudinal, vertical sectional view of Figure 1 but on an enlarged scale and with parts broken away;

Figure 3 is a view like Figure 2 but showing the sections in the collapsed position;

Figure 4 is a horizontal sectional view taken substantially on the plane of the line 4—4 of Figure 3;

Figure 5 is a perspective view of a latch element apart from the rest of the structure;

Figure 6 is a perspective view of a locking or adjusting pin apart from the rest of the structure; and

Figure 7 is a transverse, vertical sectional view taken substantially on the plane of the line 7—7 of Figure 6.

Referring more specifically to the drawing wherein like reference characters have been used throughout the several views to designate like parts, 12 designates generally an outer section which telescopically receives a middle section 13 and an inner section 14. As is readily apparent from Figures 2 and 3, the inner section 14 is telescopically received in the middle section 13. All of the sections are slidably and rotatably connected together for telescopic movement to and from the extended position of Figures 1 and 2 to the collapsed position of Figure 3. It should be noted that the outer section is located centrally of the pole when the same is extended

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which is the point of the greatest buckling strains whereby maximum strength in the device is assured. Of course, the outer section 12 comprises a case for the sections 13 and 14 when the pole is collapsed.

The outer section 12 comprises a body portion 15 the lower end of which is reduced to provide a neck 16 which has a sliding fit on the body portion of the middle section 13. The upper end of the outer section 12 likewise is reduced to provide an elongated tubular end sleeve 17 which is sized for a sliding and rotating fit on the body portion of the inner section 14. A pair of transversely aligned round holes 18 are formed through the body portion 15 of the outer section 12 adjacent the lower end thereof. Such holes 18 permit the passage therethrough of a locking or adjusting pin 19.

The locking or adjusting pin 19 is best seen in Figures 6 and 7 and is of half-round construction so as to provide an arcuate under surface 20 to permit rotation of the pin in the holes 18 and a flat upper surface 21 for flat engagement with the free edge of the neck 16 when the pin is used as an adjusting pin, Figure 2. The front end 22 of the pin 19 is of reduced diameter to facilitate insertion and withdrawal and is also angularly upwardly and forwardly directed to provide a cam surface 23 which resists but does not prevent withdrawal of the pin, whereby to prevent accidental dislodgement of the pin when in use. The rear end of the pin 19 is provided with any suitable means such as the ring 24 for connecting the pin to any suitable flexible tether 25. The other end of the tether 25 is preferably secured by any suitable means 26 to the body portion 15 of the outer section 12.

The end sleeve 17 of the outer section 12 is formed with a pair of oppositely disposed holes 27 for use with a latch member generally indicated at 28 and best seen in Figures 4 and 5. The latch member 28 comprises a spring clip having an arcuate body 29 and free ends which are inwardly curled as at 30 to provide latch dogs. The latch dogs 30 are constructed and arranged to be projected through the holes 27 in the sleeve 17 by the body portion 29 which partially encircles such sleeve. As clearly shown in Figure 4, a central part of the body portion 29 bears on the outer periphery of the sleeve 17 whereby the inwardly curled ends 30 are so located as to seat automatically in the holes 27 merely by relatively sliding and/or rotating the sleeve and clip with such central part of the body portion of the clip in contact with the sleeve until the ends 30 and holes 27 are registered. If desired, said central part of the body 29 of the latch may be fixedly secured to the sleeve 17. However, this is unnecessary and it is preferred that the latch 28 be connected to the sleeve 17 solely by the resilient grip of the dogs 30 in the holes 27. With this arrangement, a broken spring clip or latch 28 may be removed and replaced much more rapidly and economically than if it were secured in position by a rivet or other means. The edges of the latch dogs 30 are beveled as at 31 to facilitate seating of the dogs in recesses 41 and 42 to be described later.

The middle section 13 includes a body portion 32 the lower end of which is preferably closed in any suitable manner as by the cap 33 which may be permanently secured in position by any suitable means such as the rivets 34. The body portion 32 is also formed with a plurality of pairs

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of oppositely disposed holes 35 which correspond in size to the holes 18 in the outer section 12. The pairs of holes 35 are vertically spaced to permit the pin 19 to be used as an adjusting pin whereby to vary the length of the pole in a well known manner. The upper end of the middle section 13 is outwardly belled as at 36 not only to prevent withdrawal of the middle section through the lower end of the outer section but also to provide a sliding fit with the inner surface of the body portion 15 of such outer section.

The inner section 14 comprises a body portion 37 which has a sliding and rotating fit in the end sleeve 17 of the outer section 12. The lower end of the body portion 37 is outwardly belled as at 38 not only to prevent withdrawal of the inner section through the sleeve 17 but also to provide the lower end of the inner section 14 with a sliding and rotating fit in the body portion 32 of the middle section 13. The upper end of the inner section 14 is preferably closed by any suitable means such as the plug 39 which may be crimped in place as shown or otherwise suitably secured. The usual tent engaging spindle 40 may be formed on or fixed to the plug 39. The plug 39 is formed with a radially outwardly directed flange 50 which overlies and bears against the free end edge of the end sleeve 17 when the parts are in the collapsed position, Figure 3.

The body portion 37 of the inner section 14 has a pair of latch dog recesses 41 formed therein adjacent the upper end thereof. Such recesses may be in the form of notches extending only partly through the stock of the section 14 as shown, or they may be in the form of slots extending entirely through such walls. In either event, at least the end walls of the recesses are arcuate in a plane diametral of the sections or similarly beveled so as to cam the latch dogs 30 out of the recesses upon relative rotation of the sections 12 and 14. A pair of similar recesses 42 is formed in the body portion 37 of the inner section 14 adjacent the lower end thereof.

In operation and as best seen in Figure 2, the lower recesses 42 are on a plane to register with the holes 27 of sleeve 17 when the inner section has been slid outwardly of the outer section until the belled lower end 38 of the inner section engages the shoulder 43 connecting the sleeve 17 to the body portion 15. Relative partial rotation of the sections will cause recesses 42 to register with holes 27 whereby the latch dogs 30 will spring into the recesses to lock the sections 12 and 14 in the extended position. Conversely, to unlock the sections, it is only necessary to impart a slight relative rotation thereto, whereby the arcuate or beveled ends of the recesses 42 operate to cam the latch dogs out of the recesses so as to permit relative collapsing movement of the sections.

In like manner, when the lower belled end 38 of the inner section 14 contacts the floor of the end cap 33, the upper recesses 41 are on a registering plane with the holes 27 so that but a slight relative rotation of the sections is necessary to cause registration of the recesses 41 with the holes 27 so as to permit the latch dogs 30 to engage and lock the sections in the collapsed position. Unlocking is accomplished by a further partial relative rotation of the sections in the manner previously described.

As best seen in Figure 3, the inner section 14 has a pair of transversely aligned holes 44 formed therethrough which correspond to the pair of holes 18 in the outer section 12 and one

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of the pairs of holes 35 of the middle section 13. Thus, in the collapsed position, all three pairs of holes are registrable by appropriate relative rotation of the sections whereby the pin 19 may be inserted through all of the sections to lock them in the collapsed position. This arrangement does not render the upper recesses 41 unnecessary, as at times it may be desirable to lock the sections 12 and 14 together in the collapsed position while extending the sections 12 and 13 to an extended position. At the same time, the holes 44 supplement the recesses 41 and guard against accidental extension of the inner section should the latch 28 be accidentally displaced.

It is apparent that the operation of the devices may be carried out by unskilled personnel wearing gloves and without the use of tools. Likewise, the structure collapses to a compact package wherein the outer section provides a case for the rest of the structure.

Moreover, while I have shown and described what is now thought to be the preferred embodiment of the invention, it is to be understood that the same is susceptible of other forms and expressions. Consequently, I do not limit myself to the precise structure shown and described hereinabove except as hereinafter claimed.

I claim:

In a telescopic pole including a pair of tubular sections slidably and rotatably fitted together for telescopic movement to and from extended and collapsed positions, and wherein one end of one section is formed with a pair of holes and the opposite end of the other section is formed with a pair of recesses, the holes of one section being registrable with the recesses of the other section

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with said sections in said extended position; the improvement comprising an arcuate spring clip carried by said section having said holes therein, said clip having free ends curled inwardly upon said clip to provide arcuate latch dogs extending through said holes to connect said clip to said last-named section, said clip having an arcuate body portion including a central part bearing on the outer periphery of said first named section and locating said latch dogs for automatic seating in said holes upon registration therewith, and said dogs being resiliently seatable simultaneously in both of said recesses of the other section to lock said sections in said extended position.

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