

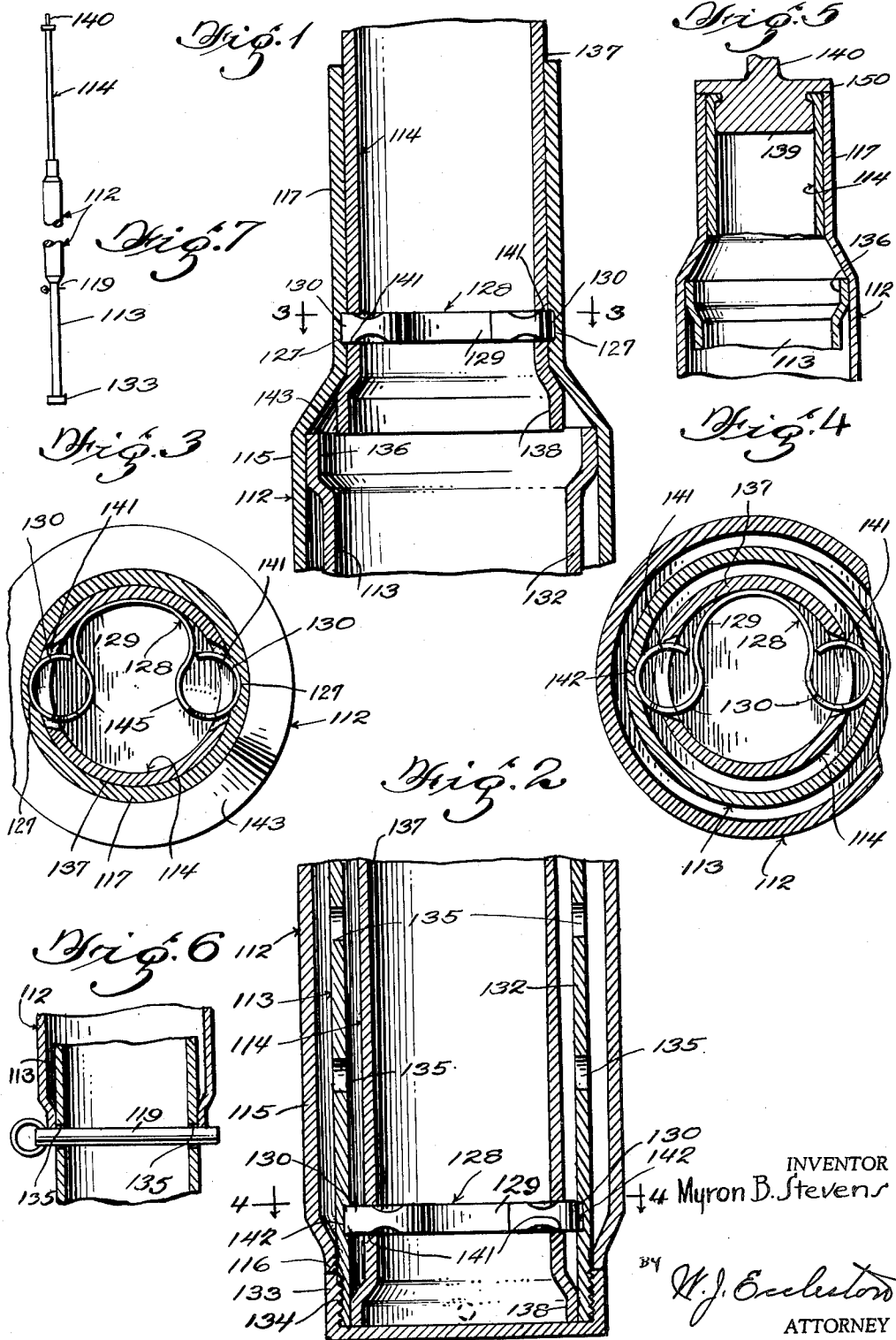
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M. B. STEVENS

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TELESCOPIC STRUCTURE

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TELESCOPIIC STRUCTURE

Myron B. Stevens, Bethesda, Md., assignor to the
United States of America as represented by the
Secretary of the Army

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6 Claims. (Cl. 287—58)

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sec. 266)

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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. Specifically, the invention comprises an improvement of the structure disclosed in the co-pending application of James S. Cornell, Serial No. 206,901, filed January 19, 1951.

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 lightweight 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

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of oppositely disposed holes in one section adjacent one end thereof, a pair of recesses in the other section adjacent the opposite end thereof, and a novel spring latch carried by the first-named section and projectable through said holes and into said recesses with said sections in an extended position whereby to lock said sections in such position.

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 enlarged, fragmentary, longitudinal, vertical sectional view of an upper portion of the invention, the parts being shown in the extended position;

Figure 2 is a similar view of the lower end of the invention but with the parts shown in the collapsed position;

Figure 3 is a horizontal sectional view taken substantially on the plane of the line 3—3 of Figure 1;

Figure 4 is a view like Figure 3 but taken substantially on the plane of the line 4—4 of Figure 2;

Figure 5 is a view like Figures 1 and 2 of the upper end of the invention, the parts being shown in the collapsed position;

Figure 6 is a view like Figure 1 of a lower portion of the invention showing means for supporting the outer and middle sections in the extended position; and

Figure 7 is an elevation on a reduced scale, showing the invention with the parts in the extended position.

Referring more specifically to the drawing wherein like reference characters have been used throughout the several views to designate like parts, 112 designates generally an outer section which telescopically receives a middle section 113 and an inner section 114. As is readily apparent from Figures 1 and 2, the inner section 114 is telescopically received in the middle section 113. All of the sections are slidably and rotatably connected together for telescopic movement to and from the extended position of Figures 1 and 7 and the collapsed position of Figures 2 and 5. It should be noted that the outer section is located centrally of the pole when the same is

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extended which is the point of the greatest buckling strains whereby maximum strength in the device is assured. Of course, the outer section 112 comprises a case for the sections 113 and 114 when the pole is collapsed.

Thus, the invention is generally the same as that shown and described in said co-pending application. However, in this form of the invention, it is unnecessary to provide pairs of holes in the outer and inner sections for a locking pin as the sections may be locked in the collapsed position by a modified latch member. In this form of the invention, if adjustability as to length is desired, the middle section 113 may be formed with a series of spaced pairs of holes 135 which are adapted to receive an adjusting pin 119 in a well known manner. If no length adjustment is desired, all but one pair of holes 135 may be omitted.

The means for locking the sections in either the extended or collapsed positions are located entirely inwardly of the sections so as to be protected from the weather and accidental dislodgement. Thus, the outer section 112 comprises a body portion 115 the lower end of which, Figure 2, is reduced to provide a neck 116 and the upper end of which, Figure 1, is reduced to provide a tubular end sleeve 117. The inner periphery of the end sleeve 117 is formed with a pair of oppositely disposed recesses 127 for the latch dogs 130 of an expansive latch member 128.

The inner section 114 comprises a body portion 137 the lower end of which is outwardly belled as at 138 to engage the shoulder 143 of the outer section 112. The body portion 137 is formed with a pair of opposed holes 141 therethrough which are alignable with the notches or recesses 127 when the parts are in the fully extended position of Figure 1. The latch member 128 comprises a spring clip having a body portion 129 and free ends which are outwardly curled to provide eyes having outwardly directed portions 130 to provide latch dogs and inwardly directed portions 145 providing finger grips to be described later. The latch dogs 130 are constructed and arranged to be projected through the holes 141 at all times whereby the latch member 128 is maintained in position in the inner member 114 at all times. With the parts in the Figures 1 and 3 position, it is obvious that a slight relative rotation of the inner and outer sections has permitted the seating of the latch dogs 130 in the recesses 127 of the outer section and that a further slight relative rotation will disengage the dogs. As best seen in Figure 3, the holes 141 are sized to permit further extension of the latch dogs 130 therethrough than is necessary to seat the dogs in the recesses 127. The purpose of this feature will be apparent hereinafter.

The middle section 113, comprises a body portion 132 the upper end of which is outwardly belled at 136 for a sliding and rotating fit in the body portion 115 of the outer section 112 and which also abuts the shoulder 143 of the latter section to limit relative collapsing movement of the outer and middle sections. The lower end of the middle section 113 is formed with any suitable means such as the screw threads 134 for detachably securing an end closure cap 133 thereto. It is desirable to make the cap 133 detachable to permit access to the interior of the device when a replacement of the latch member 128 is necessary. The inner periphery of the middle section 113 is formed with a pair of opposed recesses 142 adjacent the lower end which are

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located so as to be registrable with the holes 141 of the inner section when the lower end of the latter section is resting upon the end cap 133, Figure 2. A slight relative rotation of the inner and middle sections will cause the latch dogs 130 to seat in such recesses 142 so as to lock all of the sections in the collapsed positions. In this connection, the outer section cannot slide downwardly relatively to the middle section because the lower end of the outer section rests atop the closure cap 133. Likewise, the outer section is prevented from sliding upwardly relative to the middle and inner sections because the flange 150 of the closure plug 139, Figure 5, is bearing against the upper edges of the end sleeve 117 of the outer section 112. Thus, a single latch member 128 serves to lock all sections in the collapsed position and likewise serves to lock the outer and inner sections in the extended position. As in the co-pending application aforesaid, the outer and middle sections may be held in the extended position by the pin 119 and a pair of holes 135 formed in the middle section 113 in a well known manner. Obviously, if desired, a second means analogous to the latch 128 may be utilized to hold the outer and middle sections extended. Likewise as in the co-pending application aforesaid, at least the ends of the recesses 127 and 142 are concavely arcuate or are beveled to facilitate the withdrawal of the latch dogs 130 therefrom. By forming the holes 141 oversize, Figure 3, the latch dogs 130 are enabled to project therethrough the additional distance which is necessary to span the space between the inner section 114 and the middle section 113 and seat in the recesses 142, Figures 2 and 4.

It should be noted, Figures 3 and 4, that the inner portions 145 of the latch dogs 130 project radially inwardly of the inner section 114 at all times so as to provide finger grips facilitating the insertion or removal of the latch member 128 after closure cap 133 is removed. This may be accomplished by grasping the inner portions 145 and squeezing them toward each other.

It is apparent from the foregoing, 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.

Also, by locating the latch member 128 inside the telescopic members, it is protected against snow and ice and accidental dislodgement. At the same time it is readily accessible for replacement merely by removing the closure cap 133.

Moreover, while I have shown and described what is now thought to be a preferred embodiment form 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:

1. In a telescopic pole including outer, middle and inner sections slidably and rotatably fitted together for telescopic movement to and from extended and collapsed positions; the improvement comprising one end of said inner section being formed with a pair of opposed holes therethrough, said outer section having an opposite end formed with a pair of inwardly directed recesses therein adapted to be aligned with said holes when said sections are in said extended position, an arcuate spring clip carried by said inner section inwardly thereof, said clip having

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free ends projecting outwardly of said inner section through said holes, said free ends of said clip being seatable in said recesses to lock said inner and outer sections in said extended position, said middle section having one end formed with a pair of inwardly directed recesses adapted to be aligned with said holes when said sections are in the collapsed position, said free ends of said clip being seatable in said recesses of said middle section to lock said inner and middle sections in said collapsed position, and means releasably engageable with said inner and middle sections with the same in said extended position to prevent relative movement of said inner and middle sections to said collapsed position.

2. In a telescopic pole including an inner and an outer section slidably and rotatably fitted together for telescopic movement to and from extended and collapsed positions; the improvement comprising said inner section having a lower end formed with a pair of opposed holes there-through, said outer section having an upper end formed with a pair of inwardly directed recesses therein adapted to be aligned with said holes when said sections are in said extended position, an arcuate spring clip carried by said inner section inwardly thereof, said clip having free ends projecting outwardly of said inner section through said holes, said inner and outer sections having open lower ends, readily removable closure means for said open end of said outer section to permit access to the interiors of said sections, and said free ends of said clip including means projecting inwardly of said inner section to provide a pair of opposed finger grips for facilitating the insertion and removal of said clip to and from said inner section.

3. In a telescopic pole including an inner and an outer section slidably and rotatably fitted together for telescopic movement to and from extended and collapsed positions; the improvement comprising said inner section having a lower end formed with a pair of opposed holes there-through, said outer section having an upper end formed with a pair of inwardly directed recesses therein adapted to be aligned with said holes when said sections are in said extended position, an arcuate spring clip carried by said inner section inwardly thereof, said clip having free ends projecting outwardly of said inner section through said holes, said inner and outer sections having open lower ends, readily removable closure means for said open end of said outer section to permit access to the interiors of said sections, and said free ends of said clip including looped portions projecting inwardly of said inner section to provide a pair of opposed finger grips for facilitating the insertion and removal of said clip to and from said inner section.

4. In a telescopic pole including outer, middle and inner sections slidably and rotatably fitted together for telescopic movement to and from extended and collapsed positions; the improvement comprising said inner section having a lower end formed with a pair of opposed holes there-through, said outer section having an upper end formed with a pair of inwardly directed recesses therein adapted to be aligned with said holes when said sections are in said extended position, an arcuate spring clip carried by said

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inner section inwardly thereof, said clip having free ends curled on themselves to provide eyes, outer portions of said eyes providing latch dogs projecting outwardly of said inner section through said holes, said latch dogs being seatable in said recesses to lock said inner and outer sections in said extended position, said eyes having inner portions projecting inwardly of said inner sections to provide finger grips, said middle section having a lower end formed with a pair of inwardly directed recesses adapted to be aligned with said holes when said sections are in the collapsed position, said latch dogs of said clip being seatable in said recesses of said middle section to lock said inner and middle sections in said collapsed position, means releasably engageable with said inner and middle sections with the same in said extended position to prevent relative movement of said inner and middle sections to said collapsed position, said inner and middle sections having open lower ends to provide access to said clip, and readily removable closure means normally closing said lower end of said middle section.

5. In a telescopic pole including outer, middle and inner sections slidably and rotatably fitted together for telescopic movement to and from extended and collapsed positions; the improvement comprising said inner section having a lower end formed with a pair of opposed holes there-through, said outer section having an upper end formed with a pair of inwardly directed recesses therein adapted to be aligned with said holes when said sections are in said extended position, an arcuate spring clip carried by said inner section inwardly thereof, said clip having free ends formed to provide latch dogs projecting outwardly of said inner section through said holes, said latch dogs being seatable in said recesses to lock said inner and outer sections in said extended position, said middle section having a lower end formed with a pair of inwardly directed recesses adapted to be aligned with said holes when said sections are in said collapsed position, and said latch dogs of said clip being seatable in said recesses of said middle section to lock said inner and middle sections in said collapsed position.

6. The structure of claim 5, wherein said free ends of said clip include looped portions projecting inwardly of said inner section to provide a pair of opposed finger grips to facilitate the insertion and removal of said clip to and from said inner section.

MYRON B. STEVENS.

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