

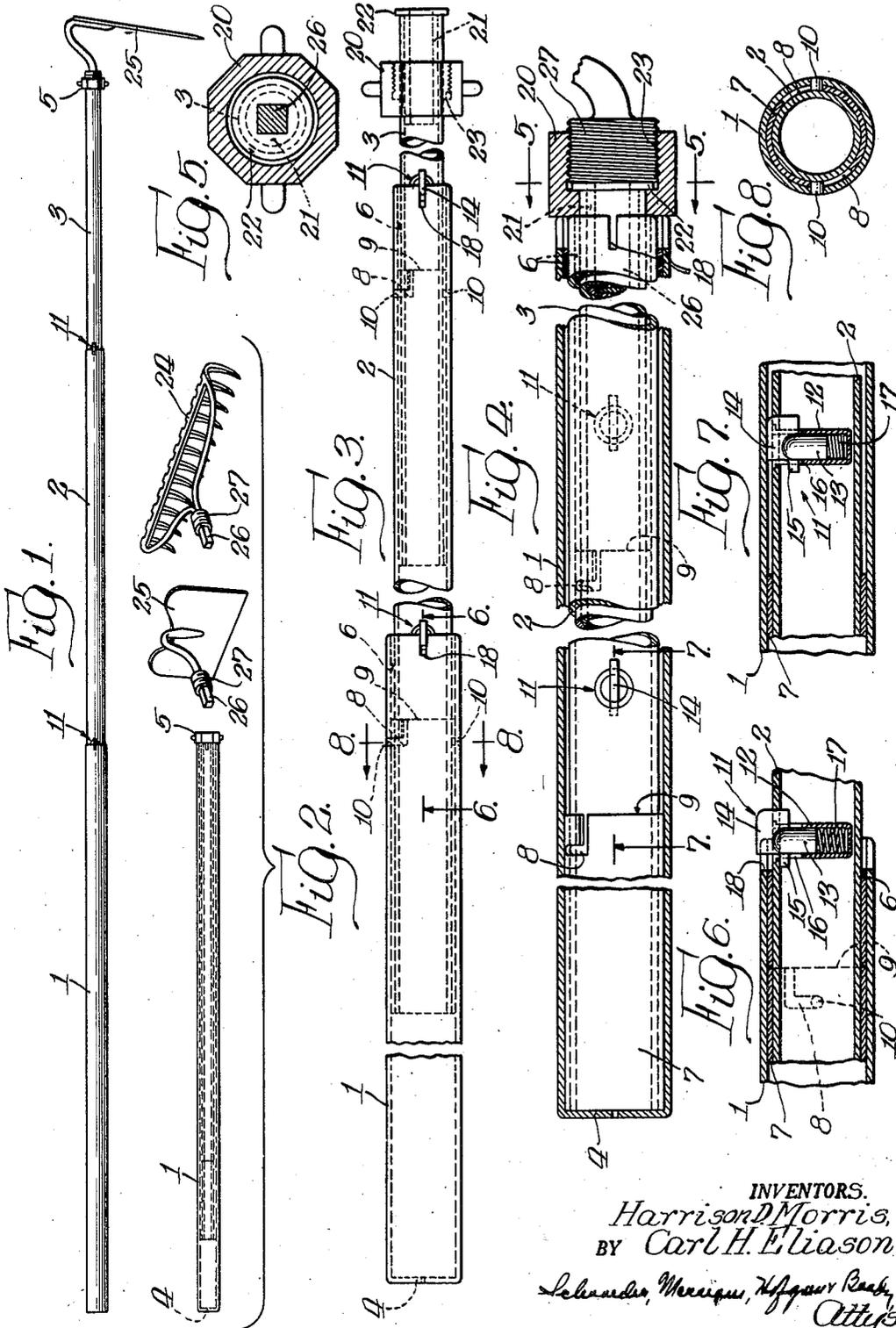
Aug. 5, 1952

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2,606,050

TELESCOPING HANDLE

Filed Aug. 16, 1949



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# UNITED STATES PATENT OFFICE

2,606,050

## TELESCOPING HANDLE

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Application August 16, 1949, Serial No. 110,622

5 Claims. (Cl. 287—58)

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This invention relates generally to telescoping units and more particularly to the particular construction of telescoping tubular sections. Telescoping rods or handles have a variety of uses in which the individual sections must be locked in their relative extended positions. It is the primary object of this invention to provide telescoping tubular sections with an improved and novel means for locking adjacent sections in their extended position.

Another object of this invention is to provide adjacent tubular sections of a telescoping rod with means for concentrically aligning each smaller section within the next larger section in all relative positions of the sections.

Another object is the provision of means for locking adjacent tubular sections against relative rotational movement when in extended position, said means being independent of means for preventing telescoping of the members in such position.

A further object of this invention is the provision of a telescoping tubular rod in which the sections thereof when once assembled are prevented from being separated accidentally into separate sections.

A still further object is the provision of a plurality of tubular telescoping sections with means for preventing bending of the sections at their junctures in extended position when subjected to forces normal to the axis of the sections.

While the invention is susceptible of embodiment in many different forms, it is shown in the drawings and will hereinafter be described in detail in one specific embodiment, with the understanding that the present disclosure is to be considered as an exemplification of the principles of the invention and is not intended to limit the invention to the embodiments illustrated. The scope of the invention will be pointed out in the appended claims.

In the drawings,

Fig. 1 is a side view of the telescoping handle of this invention placed in extended position and having a gardening implement attached thereto.

Fig. 2 is a side view of the telescoping handle in telescoped position with a perspective view of two gardening implements which could be attached thereto.

Fig. 3 is an enlarged broken side view showing in dotted lines the internal construction of the telescoping rod or handle.

Fig. 4 is a view of the telescoping handle with the sections in telescoped relation, partially in section.

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Fig. 5 is a transverse sectional view taken along the line 5—5 of Fig. 4.

Fig. 6 is a sectional view taken along line 6—6 of Fig. 3.

Fig. 7 is a broken sectional view taken along line 7—7 of Fig. 4.

Fig. 8 is a sectional view taken along line 8—8 of Fig. 3.

The telescoping handle or rod of this invention consists in general of a number of tubular sections which are of different diameters so that the sections may all be slidably fitted together endwise in the manner of a telescope. A system of sleeves is provided between each pair of adjacent sections to provide means for holding the sections concentrically aligned and to strengthen the extended rod against lateral displacement from said alignment. All longitudinal stresses placed upon the rod are transferred between sections through the sleeves or through cooperating pin and bayonet slot connections leaving only torsional stresses to be transferred between sections through separate means which thus serve primarily a locking function as will presently become more apparent.

In the embodiment illustrated in the accompanying drawings, the telescoping handle is shown as composed of three sections including a largest section 1, an intermediate section 2, and a smallest section 3 adapted to fit slidably together endwise in the manner of a telescope, though obviously two or more intermediate sections could be employed. The terms "largest," "smallest," "larger" and "smaller" as employed herein and in the claims refer to the relative cross-sectional areas of the sections and it is to be appreciated that a particular section can be both a "larger" and a "smaller" section. A closing means 4, placed over the free end of section 1 after the telescoping sections have been assembled, and a tool or device attaching means 5 carried by the free end of section 3 complete the handle. Section 3 telescopes within section 2 and both sections 3 and 2 telescope within the section 1 in the manner shown in Fig. 2 so that the whole rod or handle may be collapsed into a unit of the size defined by the length and outer diameter of the largest tubular section 1.

As best seen in Figs. 3, 4 and 6, the largest section 1 has at its inner or receiving end (the right end as viewed in Fig. 3) an internal sleeve 6 with an internal diameter just slightly larger than the external diameter of the section 2 so that the section is slidable therethrough. The section 2 in turn has at the end within the sec-

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tion 1 (i. e. the retained or first received end) a long, external sleeve 7 with an external diameter just slightly smaller than the internal diameter of the largest section 1 so as to be slidable therein but not through the internal sleeve 6. While the sleeve 6 is here shown as being relatively narrow and the sleeve 7 as relatively long, the proportions are not material so long as the combined length is substantial. In the preferred embodiment, the opposed ends or faces of the sleeves abut when the sections are extended thus bearing any longitudinal pull on the handle. This, however, is not an absolute essential, as will presently be made known and the sleeves may be spaced even in the extended position of the sections. The sleeves 6 and 7 form bearing surfaces for the joined sections and maintain the sections in axial alignment. This function is particularly important when the sections are extended and it is under that condition that the large over-all reach of sleeves 6 and 7 proves its value in maintaining the sections in straight, axial alignment even under the bending forces to which the handle is subjected.

In the preferred embodiment, the sleeve 7 is provided with a pair of diametrically opposed bayonet slots 8 which open through the inner or abutting end 9 of the sleeve 7. A pair of pins 10 project radially inwardly from the section 1 at diametrically opposed points a distance equal to the clearance between the sections 1 and 2 proper. The pins 10 are so spaced from the sleeve 6 as to be receivable in the transverse portions of the bayonet slots before or preferably simultaneously with abutment of the sleeves 6 and 7 as an incident to extension of the section 2. When the location of the pins 10 is such that they pass into the transverse portions of the slots 8 before abutment of the sleeves, the pins take both pull and push strains and thus are subject to considerable wear. When the pins 10 pass into the transverse portions of the slots 8 simultaneously with abutment of the sleeves, the sleeves take the pull strain, as already described, leaving the pins to take only the push strain. It will be apparent to any mechanic that the pins 10 and slots 8 could be reversed with the slots formed in sleeve 6 and the pins 10 carried by section 2.

Means is provided to hold the sections 1 and 2 against relative rotational movement when in extended position and by so holding the sections against relative rotation locking the sections against relative axial movement. Inasmuch as all axial stresses are carried by the sleeves 6 and 7 or the pins 10, the locking means can be of simple construction and need be sturdy enough only to hold the sections against relative rotation. Herein the locking means takes the form of a detent 11 carried within a thimble-like casing 12 inserted in the section 2 diametrically thereof, spaced inwardly of the sleeve 7. The detent has a cylindrical, bullet-like portion 13 which terminates at its outer end in a flatted or fin-like portion 14 extending both radially beyond the end of the portion 13 and laterally thereof. One corner of the portion 14 is rounded for purposes that will presently become apparent. Disposed in the same plane as the fin-like portion 14 but projecting in an opposite, lateral direction is a lug 15 forming a radially outwardly facing shoulder. The casing 12 is formed with diametrically oppositely disposed slots 16 in which the fin-like portion 14 and the lug 15 operate and by which the detent

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is held in a fixed plane with the portion 14 lying in a plane coinciding with the axis of the section 2. A compression spring 17 interposed between the bottom of the casing 12 and the detent functions to urge the same radially outwardly. It is not necessary to provide means for retaining the detent against loss out of the casing for once the sections are assembled, as will presently be described, the sections themselves serve to retain the detent.

Completing the locking means are a pair of diametrically opposed slots 18 formed in the receiving end of the section 1. These slots 18 are so positioned relative to the pins 10 and the bayonet slots in the sleeve 7 and the detent 11 that one or the other of the slots 18 will register with the detent when the pins 10 are at the ends of the transverse portions of the bayonet slots 8. The longitudinal positioning of the various cooperating elements is such that when the sections are in locked, extended position the lug 15 remains under and inwardly of the slotted area of section 1 so as to retain the detent against loss when the fin-like portion 14 projects into and through the slot 18. When the sections are telescoped, the entire detent is, of course, within the section 1 and thus is held against loss out of its casing.

It is believed apparent from the above that to lock the section 2 in extended position it is only necessary that it be pulled out of the section 1 as far as possible, rotated to bring the pins 10 into registry with the bayonet slots 8 which will then permit of a short additional axial movement of the section 2, and then a further relative rotational movement to position the pins 10 in the inner ends of the transverse portions of the bayonet slots. (The rounded corner on the fin portion 14 prevents the detent from catching on the sleeve 6.) As the pins reach that point, one of the slots 18 in the section 1 and the detent come into registry with the detent automatically projected radially outwardly with its portion 14 engaging one of the slots 18 to lock the sections against relative rotational movement and simultaneously against relative axial movement. The telescoping of the sections is just as simple as the locking thereof in extended position. All that the user need do is to depress the detent, rotate the sections relative to one another, and then push section 2 axially into section 1.

The joint and the locking means between sections 2 and 3 are identical with those just described and were there additional sections they too would be joined by identical means. Similar parts in both joints have been given a like reference number for ease in identification and understanding.

In constructing and assembling the respective sections of the telescoping handle, the sleeves 6 and 7, the pins 10, the detent 11 and the recesses 18 are first formed or mounted in or on the sections as described. It will be appreciated that in place of sleeves the sections could be turned to the desired diameters. Section 3 is then inserted into section 2 from the left as viewed in Fig. 1 or 3. These sections are then inserted into section 1 also from the left. The remaining or free end of section 1 is then closed by closure 4. This closure is herein formed simply by splitting the end of section 1 into several parts and turning the parts radially inwardly. The sections are now permanently secured together.

After assembly, the smallest section 3 is pro-

vided at its free end with means for attaching various tools as hereinbefore stated. In the embodiment shown, a nut 20 is loosely fitted over the section 3 and forced into the end of the section is a socket 21 having a recess square in cross section. The socket has a flange 22 for retaining the nut 20. The nut 20 has a partial bore 23 which is larger in diameter than the flange 22 and is internally threaded for grasping the threaded shank of a gardening implement or the like. As best seen in Fig. 2, gardening implements such as a rake 24 and a hoe 25 are provided with a shank which has a squared stud end 26 which fits into the socket 21, and a threaded portion 27. The nut 20 threadedly engages this threaded portion 27 to hold the implement onto the telescoping handle. It will be understood that a variety of different tools or implements could be substituted for those shown.

The sections 1, 2 and 3 are preferably of about equal length so that all may be telescoped within the section 1. If the sections 2 or 1 are longer than section 3 they will project when telescoped, and if shorter the extended handle is not as long as possible and section 2 may get caught behind sleeve 6.

Preferably section 2, when received fully in section 1 should be flush at the outer end and section 3 should be just a trifle longer to accommodate nut 20.

We claim as our invention:

1. A telescoping handle or rod comprising a plurality of tubular sections of different cross sectional areas to be receivable endwise one within the other; jointing means between each two adjacent sections comprising an internal sleeve mounted in the end of the larger section and adapted slidingly to receive the smaller section, an external sleeve mounted on the end of the smaller section and adapted to slide within the larger section, a pair of bayonet slots in said external sleeve opening through the inner edge thereof, a pair of pins projecting radially inwardly from the larger section spaced inwardly of the sleeve therein and adapted to be received in the bayonet slots of the external sleeve when the sections are in extended position, a detent projecting radially outwardly of the smaller section spaced inwardly of said external sleeve and a recess in the end of the larger section carrying the internal sleeve adapted to be engaged by said detent when said pins are in the limit positions in said bayonet slots.

2. A telescoping handle or rod comprising a pair of end sections and at least one intermediate section, each of said sections having a main bore with the bores in successive sections progressively smaller to have the sections slidable one within the other, the larger end section having at one end thereof a portion of increased radial thickness with a bore just slightly larger than the external diameter of the intermediate section whereby the intermediate section may be inserted into the larger end section through the nonreduced end thereof, a portion of enlarged diameter on the last inserted end of the intermediate section having a diameter just slightly smaller than the main bore in the larger end section to provide a shoulder for abutment with the portion of reduced diameter of the larger end section to prevent withdrawal of the intermediate section in one direction longitudinally of the larger end section, a portion of increased radial thickness at the other end of the inter-

mediate section having a reduced bore of a diameter just slightly larger than the external diameter of the smaller end section slidingly to receive the smaller end section, a portion of enlarged diameter on the last inserted end of said smaller section forming a shoulder abutting with the portion of reduced diameter in the intermediate section to prevent complete withdrawal of the smaller end section in one direction from the intermediate section, means closing the nonreduced end of the larger end section to prevent withdrawal of either the intermediate or the smaller end section therethrough, and means for locking said sections in extended position comprising a pair of bayonet slots formed in the externally enlarged portion of each section opening inwardly through the end thereof, a pair of pins projecting radially inwardly from each section having an inwardly enlarged portion positioned to be receivable in the bayonet slots when the sections are in extended position and with the enlarged portions abutting, and cooperating means on adjacent sections operable to engage and hold adjacent sections only against relative rotation when said pins are in the limit positions in the bayonet slots.

3. A telescoping rod comprising a plurality of tubular sections adapted to telescope together concentrically, a cylindrical ring member mounted in one end of each larger section and having an inner diameter just slightly larger than the outer diameter of the next smaller section, a sleeve concentrically mounted on each smaller section and adapted to abut against said ring member when adjacent sections are extended whereby movement of said adjacent sections apart is limited, a bayonet slot in said sleeve opening to the edge of the sleeve facing the ring member, a radially projecting pin secured to the larger section for engagement in said bayonet slot, and means for locking said adjacent sections in extended position, said means comprising a spring pressed detent mounted radially in said smaller section, said detent having an integral body portion and a narrow head of rectangular cross section, said head being adapted to engage a longitudinal slot in the end of the adjacent larger section and to extend beyond the end of said slot and a stud near the base of said head adapted to engage the inner surface of said larger section to limit the movement of said detent out of said smaller section, whereby longitudinal movement of the sections is resisted only by said pin in the bayonet slot and the abutting sleeve and ring and relative rotational movement is resisted by said detent head engaging the longitudinal slot.

4. A telescoping handle comprising a plurality of tubular sections of successively decreasing diameter and length, a sleeve rigid with each of said smaller sections and having an outer diameter providing a sliding fit between the sleeve and the next larger tubular section, each of said sleeves having a bayonet slot opening to the edge of the sleeve facing said smaller tubular section, a pin projecting inwardly from each larger section and adapted to be received in said slot to lock said sections against relative longitudinal movement and a spring pressed detent mounted in each smaller section and adapted to project into a longitudinal slot in the free end of each larger section when said pin is moved to the limit position of said bayonet slot whereby said sections are locked against relative rotational movement.

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5. A locking unit for locking telescoping tubular members in extended position comprising a sleeve rigid with the smaller of said members and adapted to fit snugly within the larger of said members to hold said members in axial alignment, said sleeve having a bayonet slot in the outer surface thereof opening to the marginal edge of said sleeve facing the end of the larger member through which said smaller member may be extended, a pin mounted within said larger member and adapted to engage said bayonet slot, and a spring pressed detent mounted within said smaller member and adapted to engage a longitudinal slot in said larger member when said pin is moved to the closed end of said bayonet slot whereby said members are locked against longitudinal or rotational movement relative to each other.

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