

Feb. 10, 1959

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2,873,129

LOCK FOR TELESCOPIC CONNECTIONS

Filed Aug. 29, 1955

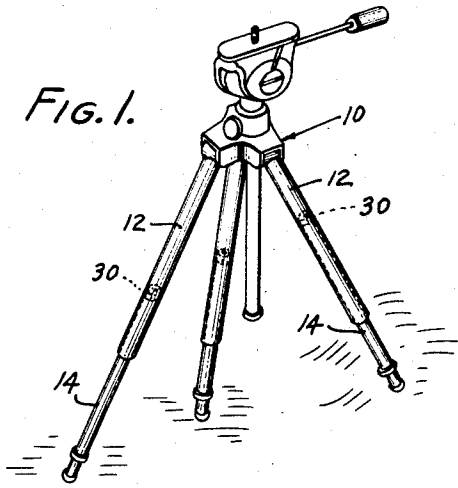


Fig. 1.

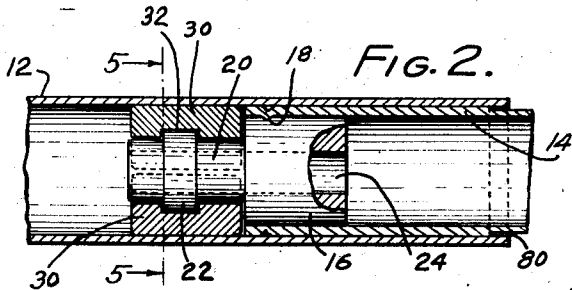


Fig. 2.

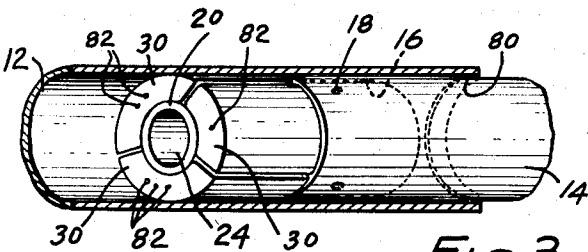


Fig. 3.

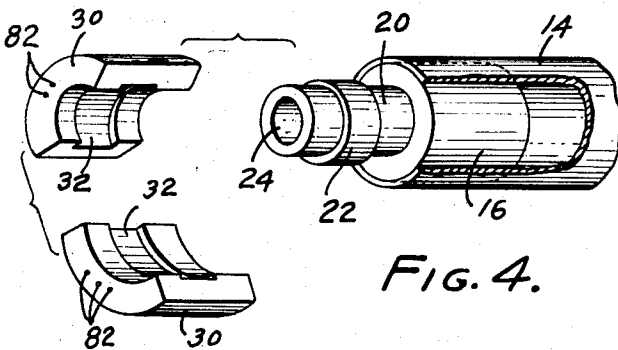


Fig. 4.

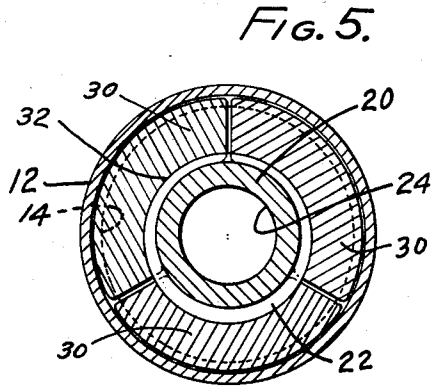


Fig. 5.

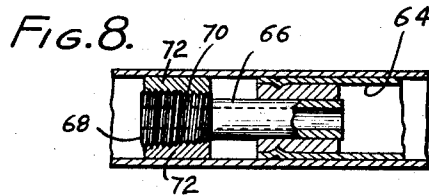


Fig. 8.

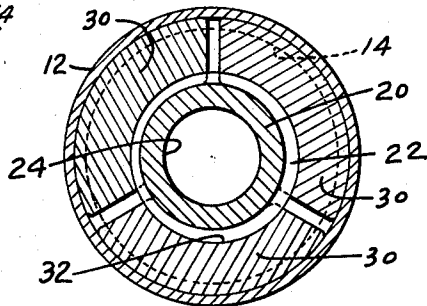


Fig. 6.

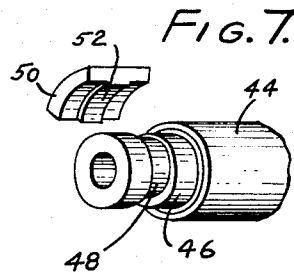


Fig. 7.

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2,873,129

LOCK FOR TELESCOPIC CONNECTIONS

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Application August 29, 1955, Serial No. 530,959

5 Claims. (Cl. 287—58)

This invention relates to improved "Lock For Telescopic Connections" and has as one of its principal objects, the provision of a relatively simple, but very effective device for securely fastening two or more telescoped elements in desired relative position.

One of the principal objects of this invention is to provide a locking device of the class described, which includes a plurality of associated circularly disposed locking members on an eccentric support, whereby a shifting of the eccentric element will serve to firmly lock the telescoped parts together.

Another object of the invention is the provision, in a locking device for telescopic connections and particularly tubular elements, of an eccentric mounted on one of the elements and positioned inside the other, whereby a plurality of correspondingly eccentric, separable but associated elements on the first eccentric, are moved into and out of a locking position.

Yet another object of the invention is the provision, in a device of the class described, of means whereby the parts, when properly assembled, will be maintained in such relationship against inadvertent or accidental displacement.

Other and further important objects of the invention will be apparent from the disclosures in the accompanying drawings and following specification.

The invention, in a preferred form, is illustrated in the drawings and hereinafter more fully described.

In the drawings:

Figure 1 is a perspective view of a tripod, or similar construction, into which the locking device of this invention can be incorporated.

Figure 2 is an enlarged section illustrating the details of a preferred embodiment of the invention.

Figure 3 is a view, partly in section, illustrating more details of the structure of Figure 2.

Figure 4 is an exploded view of the construction of Figures 2 and 3, one part being omitted.

Figure 5 is a further enlarged section, taken on the plane of the line 5—5 of Figure 2, looking in the direction indicated by the arrows.

Figure 6 is a sectional view similar to that of Figure 5, but showing the parts in a locked position as distinguished from the unlocked position of Figure 5.

Figure 7 is a perspective view showing a slightly modified form of the invention.

Figure 8 illustrates another modification.

As shown in the drawings:

The reference numeral 10 indicates generally a tripod, such as those used commercially for many purposes, and as such devices are often used in places where the ground support is uneven or where the tripod itself may have to be positioned at an angle to the vertical, adjustment of the legs is often necessary, and in the interests of efficiency such adjustments should be quick and positive.

It will be obvious that other telescoping constructions likewise require similar adjustments, and a particu-

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lar instance comprises an assemblage of tubes used for various purposes, such as cleaning swimming pools.

Other embodiments may include tubular connections for vacuum sweepers, adjustable pipes for carrying liquids or gases, adjustable handles for brushes, clamps or other tools.

Additional possible applications for the telescoping tube lock of this invention include extensible handles for removing and replacing light bulbs in high places, such as in office buildings, service stations and the like. The lock can also be used on telescoping tent poles, camper's shelter poles, camper's tables, stove stands and flag poles.

Other adaptations comprise adjustable legs for microphones, music stands, folding furniture, drafting table tilt adjustments and lamp supports. The lock can be used on extensible tree trimmers, and measuring rods used by painters or drapers.

Other and further embodiments include extensible bars for checking wheel alignment or "toe in" on automobiles, extensible paint roller handles, sign painters equipment, bill board rollers, extensible rods used by telephone and electric linesmen. In this case lengths of wire can be threaded through trees in a simple and speedy manner.

Telescoping gun cleaning rods can include the lock of this invention. Also spears used by skin divers. The lock can be used on collapsible oars used in boats of various types, and included in emergency kits for flyers. Portable barriers used to control crowds in various places, such as in super markets and places of amusement, can also include the fast acting lock of this invention.

In Figure 2, a pair of telescoping tubes 12 and 14 is indicated, and tubes of this type may be employed in any of the various adaptations hereinabove described. The tube 14 fits slidably in the tube 12 as shown, and a cylindrical element 16 is fitted into one end of the tube 14 and securely held in desired position by peening or the like 18.

As best shown in Figure 4 this cylindrical element 16 includes an extension 20 having an integral eccentric raised intermediate portion 22. The element 16—20—22 is illustrated as having an opening 24 therethrough, but unless the apparatus is designed for a passage of fluid or a wire, this opening may be omitted.

A plurality of locking elements, shown as three in the drawings and indicated by the reference numerals 30, is positioned about the extension 20 with its integral eccentric 22 and it will be obvious that four or even more of such locking elements may be employed, if occasion arises.

As shown in Figure 5, the locking elements 30 are grouped in a predetermined relation about the extension 20 and the eccentric 22 and the inner faces of the elements 30 are correspondingly grooved to fit about the eccentric 22, all as best shown at 32 in Figure 4. These grooves are of varying depths, corresponding to the eccentricity of element 22.

In Figure 5, the eccentric 22 is illustrated in an intermediate position, whereby the locking elements 30 are allowed to fit more or less closely together and a free slidable action is permitted between the grouped locking elements and the inner face of the tube 12.

However, when the tube or pipe 14 is turned slightly to either the left or right, the eccentric 22 will, as shown in Figure 6, act to spread the elements 30 apart, with the result that they will contact the inner face of the tube or pipe 12 and will securely grip the same, depending, of course, on the turning movement of the tube 14 with its interconnected cylinder 16 and the locking means 20—22—30. Obviously a turning in either di-

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rection will produce such a locking relationship, and a turn back to the intermediate phase will provide a corresponding release.

A slightly modified form of the invention is shown in Figure 7, wherein the tube, pipe or leg 44 includes an extension 46 provided with an eccentrically positioned recess 48 intermediate its ends. A plurality of locking elements 50 is adapted to be fitted about the extension 46—48 in substantially the same manner as the elements 30 of the preceding figures. A distinction resides in the fact that a protuberance 52 is provided on each of the elements 50 adapted to interfit with the eccentric depression or groove 48.

A still further modification is shown in Figure 8, where a tube or rod 64 is provided with an extension 66 having a slightly tapered head 68 threaded at 70. A plurality of locking elements 72 likewise internally taper threaded is adapted to be fitted onto the conical extension 68. When the rod 64 is turned one way or another, locking or release is accomplished.

In order to prevent inadvertent or accidental pulling apart of the assembled structure, with consequent dislocation of the locking lugs 30, an annular or other stop 80 is provided at one end of the tube 12, whereby, after the parts are fitted into each other from the other end of the tube 12, elongation of the two interconnected tubes can be had to the limit of the stop 80 and without fear of loss of any parts. The locking elements 30 must be arranged in proper sequence and for that purpose suitable markings such as dots or impressions 82 are made on the outer faces thereof as shown in Figures 3 and 4, so that even in the event of accidental dislodgment, proper re-assembly can be had with no difficulty.

It will be evident that herein is provided a simple, yet quick and positive lock for the relative positioning of two tubes, or a tube or pipe and a rod, wherein a practically immediate adjustment of the over-all length of the assembled structure can be had and without any danger of the same becoming loose or slipping, even under the most extreme conditions of use and handling.

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I am aware that many changes may be made and numerous details of construction varied throughout a wide range without departing from the principles of this invention and I therefore do not propose limiting the patent granted hereon otherwise than as necessitated by the prior art.

I claim as my invention.

1. A lock for two telescopic tubular connections comprising a fitting fixed in one of the connections, an extension integral with the fitting, an eccentric forming part of the extension, a plurality of locking lugs grouped about the eccentric and extension, the eccentric comprising an enlargement of the extension and the lugs being interiorly recessed to receive the eccentric.

2. A device as described in claim 1, wherein a stop is provided on the second connection for limiting relative movements between said connections.

3. A device as described in claim 2, wherein the outside diameter of the grouped lugs, when in release position, is greater than the inside dimension of the stop.

4. A device as described in claim 2, wherein the maximum outside diameter of the grouped lugs when in locking position is at least the same as the maximum inside diameter of the second connection.

5. A lock for two telescopic tubular connections comprising a fitting fixed in one of the connections, an extension integral with the fitting, an eccentric forming part of the extension, a plurality of locking lugs grouped about the eccentric, the eccentric comprising an annular groove in the extension and the lugs comprising integral protuberances corresponding with the groove.

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