July 18, 1961 R. L. BLANCHARD 2,992,845

FRICTION DEVICE

Filed Feb. 20, 1958

Fig. 1

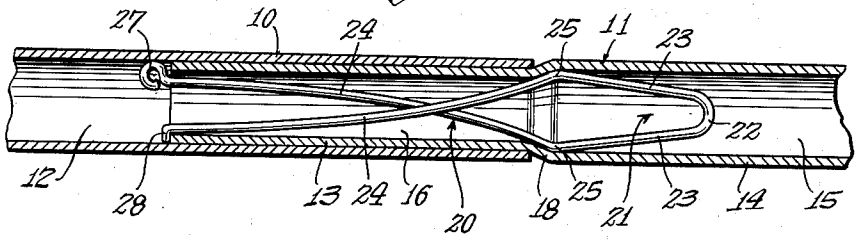


Fig. 2

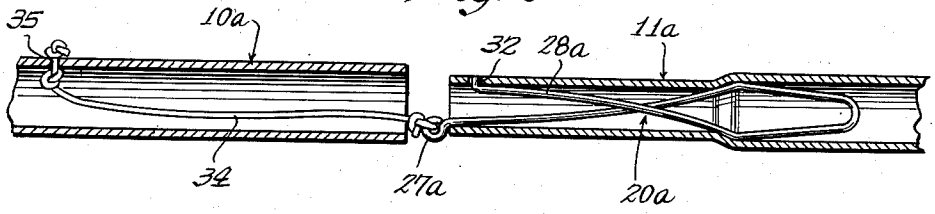


Fig. 3

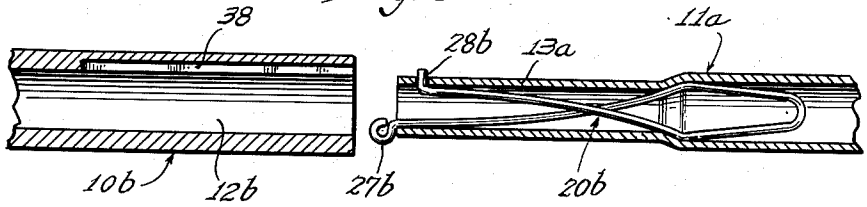
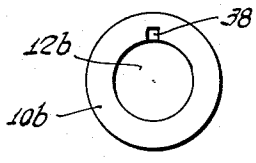


Fig. 4



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FRICTION DEVICE

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This invention relates to devices constituting separable joints or connectors, and more particularly to connector or joint devices of the type wherein one part telescopes with another.

The invention is illustrated in connection with telescoping tubular members such as are advantageously employed in collapsible tent constructions and the like. However, it will be understood that the invention is not to be limited to tent or similar structures but instead has utility generally in the field of separable connections or joints.

An object of the invention is to provide a novel and improved separable joint device which is especially simple in its construction, involving essentially but a single novel functional member other than the interfitting or telescoping parts.

Another object of the invention is to provide an improved connector or joint device as above set forth, which is especially adapted or suited to a construction wherein one of the separable parts has a telescoping portion of reduced diameter, forming in said part an internal, annular shoulder.

A further object of the invention is to provide an improved separable joint device of the above type, wherein a simple folded wire piece may constitute the functional member which effects retention of one part on the other.

A feature of the invention resides in the provision of an improved separable joint device as the above characterized, wherein the folded wire part may constitute not only a frictional detent but also a keying means to prevent relative turning movement of the telescoping parts.

Another feature of the invention resides in the provision of an improved separable joint device having a folded wire detent piece as above set forth, wherein simple means are provided in conjunction with said piece, for tying the separable parts to each other against complete separation when the parts are uncoupled.

A still further object of the invention is to provide an improved separable connector or coupling device in accordance with the foregoing, which is extremely simple in its construction, involving few inexpensive parts easily and quickly assembled, and which is nevertheless reliable in its action at all times.

Other features and advantages will hereinafter appear.

In the drawings accompanying this specification, similar characters of reference indicate corresponding parts wherever possible in the several views, in which:

FIGURE 1 is an axial sectional view of a separable joint device made in accordance with the invention, the separable parts being shown as coupled to each other.

FIG. 2 is an axial sectional view of a separable joint device illustrating another form of the invention, the separable parts being shown as uncoupled from each other but held together against complete separation.

FIG. 3 is an axial sectional view of a separable joint device showing a modification of the invention wherein the separable parts are prevented from relative turning when coupled to each other.

FIG. 4 is an end elevational view of one of the parts of the separable joint of FIG. 3.

Referring first to FIG. 1 there is shown a separable tubular-joint friction device comprising a pair of telescoping members **10** and **11**, the member **10** being in the form of a tube having an elongate bore **12** adapted to receive a portion **13** (of the member **11**) which is swaged or otherwise formed to have a reduced diameter.

By virtue of the forming of the member **11** it will have a portion **14** characterized by a relatively large bore **15**, said portion **14** being normally disposed outside of the member **10**. The smaller-diameter portion **13** of the member **11** is receivable in the bore **12** of the member **10**, and has a bore **16** which is smaller than the bore **15**, as may be readily seen. With this construction, a shoulder portion **18** exists between the portions **13** and **14**, presenting both an exterior annular shoulder and an internal annular shoulder.

In accordance with the present invention I provide a simple and novel spring part **20**, adapted to be carried in the member **11** and to occupy the bores **15** and **16** thereof, said spring part being advantageously formed of a bent or folded wire and being constituted to act as a spring detent. The part **20** may have a yoke or connector portion **21** constituted of a yoke proper **22** and legs **23**, and may have extensions **24** of such legs, disposed mainly in the smaller bore **16**. The wire part **20** has bends **25** which are adapted to engage the internal shoulder of the shoulder portion **18**, comprising cooperable friction detent means to position the wire part **20** in the member **11**.

One end **27** of the wire part is formed as a loop disposed in a diametric plane, said loop projecting laterally and axially from the extremity of the member **11**, whereas the other end **28** is bent at an angle to constitute a hook and is adapted to engage the edge of the said extremity. The angular end **28** of the wire part **20** in conjunction with the bends **25** provide for positioning and retention of the wire part in the member **11**. The loop end **27** is adapted to engage the inside of the member **10** under appreciable pressure, thereby to frictionally retain the members **10** and **11** in the assembled positions shown.

The wire part **20** may be constituted of relatively heavy and stiff wire, as for example No. 12 or 11, whereby an appreciable force may be exerted against the inside of the member **10** to effect the said friction retention.

It will be observed that the rounded portion of the loop **27** may constitute in effect a sloping nose, engageable with the edge or extremity of the member **10** when the two members are being brought together. In consequence, an advantageous camming action results, which enables the members to be interfitted even though the spring pressure of the wire part **20** is quite considerable.

It will now be understood from the foregoing that I have provide an extremely simple, novel frictional joint device whereby two telescoping members may be readily coupled together and held in coupled relation. My improved friction device comprises essentially the single wire part **20**, which is simple and inexpensive to fabricate, and which may be easily and quickly inserted in or assembled to the member **11** by use of a suitable tool. The bends **25** and the bent end **28** will effectively retain the wire part **20** in the member **11**, once it has been assembled therein. A friction joint device as above set forth may be advantageously incorporated in collapsible tent constructions, as well as in other equipment requiring a quick assembly and disconnect device.

Another embodiment of the invention is illustrated in FIG. 2, wherein the members **10***a* and **11***a* when pulled apart are still prevented from complete separation. In this figure, the spring part **20***a* is similar to the part **20** described above except that the end portion **28***a* thereof is shorter, and extends into a side opening **32** in the wall of the member **11***a*. This blocks the wire part **20***a* in place in a positive manner. I additionally provide a

cord, chain, wire or linkage **34** one end of which is secured to the loop **27***a* of the wire part **20***a* and the other end of which passes through an opening **35** in the wall of the member **10***a* whereby the members are permanently tied to each other even when uncoupled. The cord **34** may be of nylon or other suitable material, as will be readily understood.

Another embodiment of the invention is illustrated in FIGS. 3 and 4, wherein a wire part **20***b* has an angular end portion **28***b* which not only passes through but projects radially from the side of the reduced portion **13***a* of the member **11***a*.

Adapted to receive the reduced portion **13***a* is a member **10***b* having an elongate bore **12***b* provided with a longitudinal groove or keyway **38**. The groove **38** is adapted to receive the projecting end portion **28***b* of the wire part **20***b* when the members **10***b* and **11***a* are coupled together, and thus the said members are prevented from having relative turning movement. The loop **27***b* of the wire part **20***b* exerts force on the wall of the bore **12***b* to effect a frictional detent, as with the previously described forms of the invention. If desired, the cord **34** may also be used with the device of FIGS. 3 and 4, by tying the cord to the eye **27***b* of the spring in the manner indicated in FIG. 2, and securing the cord within the tubular member **10***b* in any suitable manner.

It will be readily understood from the foregoing that I have provided a simple, improved separable-joint friction device having novel keying means preventing relative turning movement of the separable parts, and having a novel cord or linkage means preventing complete separation of the coupling members.

Variations and modifications may be made within the scope of the claims, and portions of the improvement may be used without others.

I claim:

1. A separable joint device comprising a pair of telescoping members, one member having an elongate, deep bore and the other member having an elongate hollow part a portion of which is receivable in said bore and another portion of which remains outside of said bore and has a larger bore than said one portion, the said part having an internal shoulder between the said longer and smaller bores and having an external shoulder adjacent the location of the internal shoulder and engageable with the edge of said one member to limit the telescoping movement of the members, and a folded wire spring disposed in said hollow part, having a yoke portion and having a shoulder portion adjacent said yoke portion, said hollow part and wire spring having cooperable friction detent means normally yieldably retaining the spring in said part and enabling separation of the spring from the part in response to a sufficient pull being exerted on the spring, said cooperable detent means comprising the said shoulder of the spring and internal shoulder of the hollow part, said shoulder of the spring engaging the said internal shoulder in the bore of the hollow part, thereby to retain the spring therein, and said spring further having one end portion projecting from the end of said hollow part and offset laterally whereby it is adapted to frictionally engage and seize a wall of the bore of the one member to frictionally retain the members together.

2. The invention as defined in claim 1, in which the said one end portion of the spring is formed into a loop disposed substantially in a diametric plane, said loop having an outer portion adapted to project beyond the outer wall of the said hollow part.

3. The invention as defined in claim 1 in which the wire spring has another end portion bent into the shape of a hook and adapted to engage and hook over the edge of the said hollow part.

4. The invention as defined in claim 1 in which the said one end portion of the spring is formed into a loop disposed substantially in a diametric plane, said loop having an outer portion adapted to project beyond the outer wall of the said hollow part, and in which the wire spring has another end portion bent into the shape of a hook and adapted to engage and hook over the edge of the said hollow part.

5. The invention as defined in claim 1 in which the spring has a second end portion bent at an angle, and in which the hollow part has an opening in its wall, in which said bent end portion is disposed, thereby to lock the wire spring in the hollow part.

6. The invention as defined in claim 1 in which there is a cord secured to the said one end portion of the wire spring and secured in the bore of the said other member, to prevent the said members from being completely separated from each other.

7. The invention as defined in claim 4 in which the hooked end of the wire spring projects beyond the wall of the hollow part, and in which the said one member has a longitudinal groove in the wall of the said bore thereof, said groove being adapted to receive the extended hook, thereby to prevent relative turning between the members.

8. The invention as defined in claim 2 in which there is a cord secured to the said one end portion of the wire spring and secured in the bore of the said one member, thereby to prevent the members from being completely separated.

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