United States Patent

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[54] **ELONGATE-EXTENSIBLE MEMBER**
1 Claim, 4 Drawing Figs.

[52] **U.S. Cl.** **248/411,** 85/70
[51] **Int. Cl.** **F16m 11/26**
[50] **Field of Search** ..... 248/411, 412, 354, 355, 161, 188.5; 287/58(CT); 85/70, 67; 287/20.3

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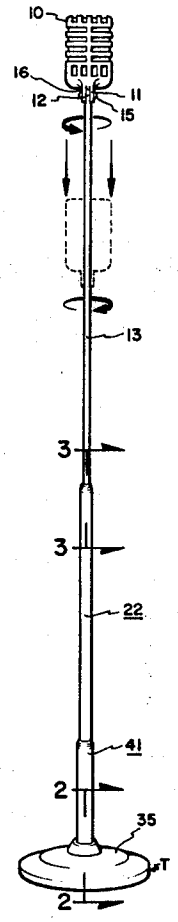
ABSTRACT: The present invention comprises an elongate extensible device employing one or more compression-type friction-lock devices within the design. These are utilized to permit selectable mounting of the device, selectable extension thereof, and so forth. The elongate structure of the present invention is suitable for incorporation in a variety of contexts, such as microphone stands, camera and projector stands, extensible legs, pointers, and so forth.



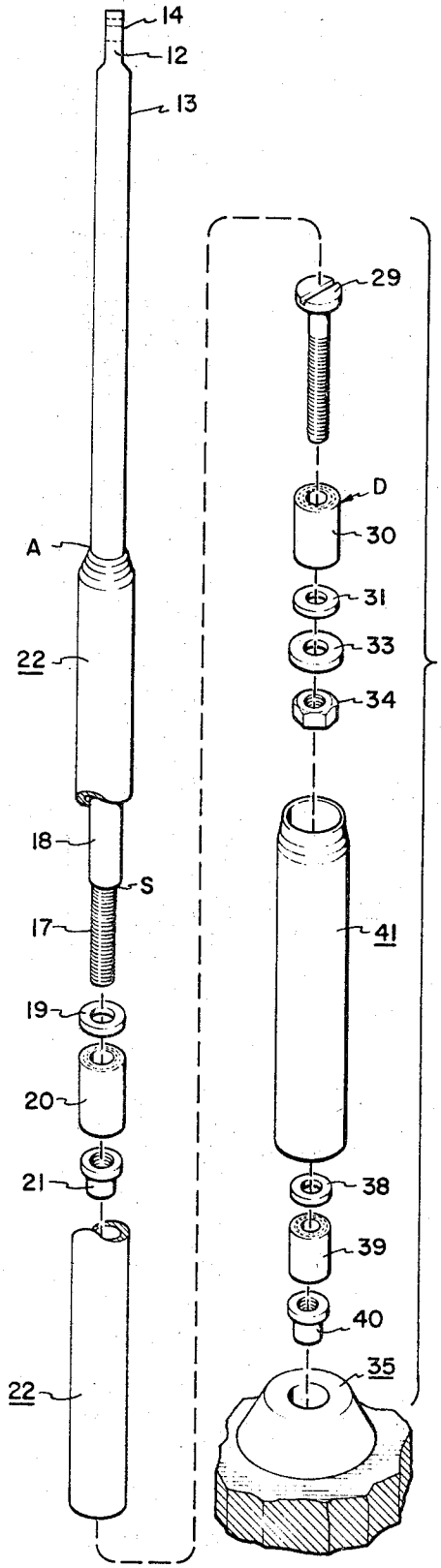


FIG. 4

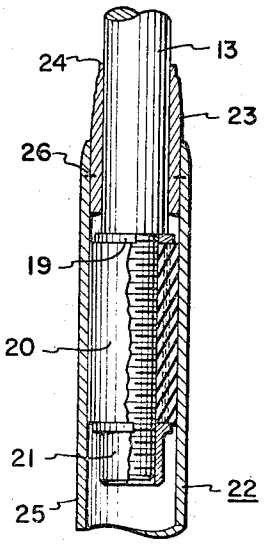


FIG. 3

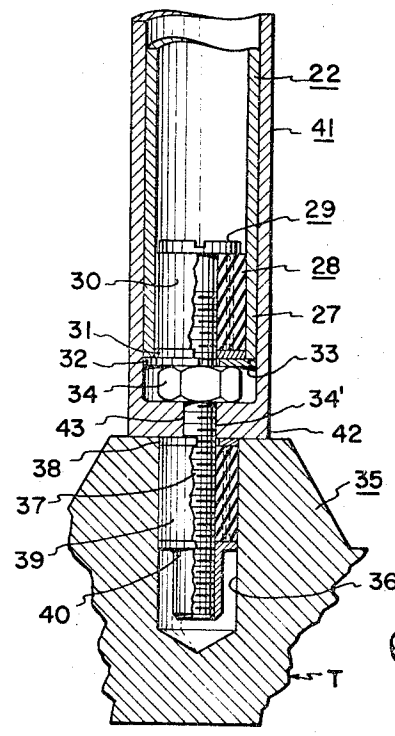


FIG. 2

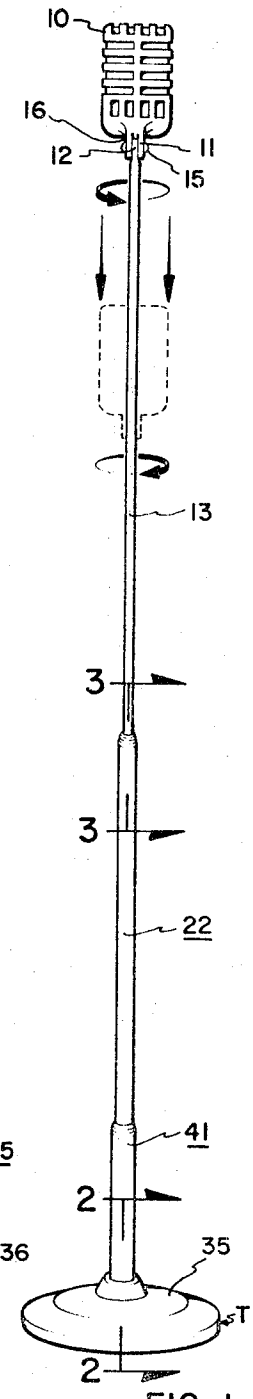


FIG. 1

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ELONGATE-EXTENSIBLE MEMBER

The present invention relates to elongate devices which are adjustable as to extension and retraction and, more particularly, to a new and improved elongate device of the type described wherein by means of incorporation of one or more friction locks within the structure, the device may be used in a versatile manner in a number of contexts. In the past, a number of different types of devices have been made which are extensible and withdrawable in one way or another. Conventional microphone stands, music stands, and so forth, will conventionally include a locking collar that is threaded to the base of the unit. The locking collar has jaws or other securement means provided therewithin for selectively locking and releasing the lock upon a central moveable shaft. Such structures have proved to be expensive to produce, cumbersome in use, and rather difficult to manipulate, requiring the user to grasp, not only the collar, but also the base to which the collar is threaded.

Accordingly, a principal object of the present invention is to provide a new and improved extensible structure incorporating a selectively releasable friction-lock.

A further object is to provide a new friction-locking construction.

A further object is to provide an extensible and retractable elongate device wherein plural friction-lock devices are incorporated in the design to admit the securement of the object to an external member such as a base, and also to provide selective and easy locking and release of lock for members upper portions of which are extensible.

An additional object of the invention is to provide a means whereby one or more frictional-locking devices incorporating friction-lock elastomeric sleeve may be manipulated remotely and exteriorly of the area in which the locking device is used.

The features of the present invention which are believed to be novel are set forth with particularity in the appended claims. The present invention, both as to its organization and manner of operation, together with further objects and advantages thereof, may best be understood by reference to the following description, taken in connection with the accompanying drawings in which:

FIG. 1 is a front perspective of a microphone stand incorporating the principles of the present invention.

FIG. 2 is an enlarged fragmentary view, shown in vertical section, of the base portion of the device illustrated in FIG. 1.

FIG. 3 is an enlarged section and is taken along the line 3–3 in FIG. 1.

FIG. 4 is an exploded view of the structure illustrated in FIG. 1.

In FIG. 1, microphone **10** includes a base clevis mount **11** to which is secured an upper ear **12** or rod **13**, of the elongate construction of the present invention when taking the form of a stand. Ear **12** includes an aperture **14** which is alined with the apertures **15** and **16** of mount **11**. Pivot pin **17** is provided and may take any one of several standard forms for securing a microphone to a rod or a shaft. Rod **13** may be solid or hollow, as desired. Where hollow, a stud **17** may be threaded into the inwardly threaded portion **18** of rod **13** to provide a secure mounting. Of course, where the rod **13** is solid then the stud **17** may be appropriately turned and threaded in a conventional manner. It is deemed preferable, however, that a hollow configuration for rod **13** may be used.

Disposed upon the threaded portion of stud **17** is a washer or bearing **19**, backing rod reaction shoulder S, and which itself is backed by radially expansible, axially compressible, resilient, elastomeric sleeve **20** and nut **21** the latter of which is threaded onto the stud **17**. Thus, it will be seen that when the parts (shown in exploded view in FIG. **4** at the left-hand side thereof) are assembled onto threaded portion or stud **17**, that a slight manual preload may be applied to the sleeve **20** by the user turning merely with his thumb and fingers the nut **21** upon stud **17**. The general construction of the device, when assembled, is illustrated in FIG. **3**, wherein rod **13** is seen as being disposed within central sleeve **22**. The tubular standard, i.e. central sleeve **22**, may include an end portion **23** simply pressed into the upper end **24** of central sleeve member **25**. The representative line **26** merely indicates that members **24** and **25** shall be joined and considered as an integral unit. In practice it is preferred to provide the structure as shown, since the end portion or ferrule **24** serves as a guide for rod **13**; further, additional interior space is provided for the expansion of sleeve **20**.

The lower end **27** of central sleeve **22** is provided with a friction-lock device **28** as follows. Bolt **29** has included thereover an axially compressible, radially expandable sleeve **30** which is backed by alinement bushing **31** and washer **32**. The latter abuts the end **33** of the central sleeve **22**. With the user merely tightening the nut **34** upon the threaded shank **34'** of bolt **29**, a tight compression load can be exerted by compression sleeve **30** so that this end fitting, including threaded shank **34**, will be rigidly secured to and within this end of central sleeve **22**.

Base support T is provided with base **35** which rests upon a ground plane and is provided with a central aperture or bore **36**. This bore receives the lower-most portion **37** of the bolt **29** and, as well, the washer **38**, elastomeric, axially compressible, radially expandable sleeve **39**, and nut **40** which is threaded upon the threaded shank of bolt **29**. It is to be noted that tubular stub of the base takes the form of a closed-end sleeve nut **41** which has a base portion **42** which has a threaded aperture at **43** to threadingly receive bolt **29**. It is to be noted that the nut **34** engages the internal face of base portion **42**. Hence, when the sleeve nut **41** is manually rotated, the same will serve to compress sleeve **39** and thus produce a friction-lock within the base **35** (by virtue of the expansion of sleeve **39**) without disturbing the friction-lock produced by sleeve **30** within elongate sleeve **22**.

The structure as thus far described is assembled and operates as follows. The central elongate tube **22** is first provided with friction-lock components including sleeve **30**, bolt **29**, bushing **31**, and washer **32**, and the nut **34** is tightened down against the lower end (by washer **33**) of central tube **22**, this so as to produce a secure friction-lock by device **28** at the lower end of central tube **22**. The tightening of nut **34** produces a compression of elastomeric sleeve **30** so as to obtain the friction-lock before mentioned.

At This point, the lower portion of tube **22** is introduced into the sleeve nut **41**, and shank **34'** of bolt **29** is threaded through the threaded aperture **43** such that the threaded shank of the bolt proceeds therebelow. At this point the friction-lock device, including the aforementioned threaded shank of the bolt and elastomeric sleeve **39**, washer **38**, and nut **40**, is assembled. A slight preload is given the elastomeric sleeve **39** through the manual tightening of nut **40** upon the shank **34'** of bolt **29**. Next, these parts as above referenced, are introduced as a frictional-locking device within the bore **36** of base **35**. A manual tightening of the sleeve nut **41** produces a tightening of nut **40** against the lower end of sleeve **39** so as to produce a very rigid and fixed securement of this portion of the structure within bore **36**. It will be noted that the bolt **29** has previously been secured with its structure to the lower end of central tube **22** by the prior tightening of nut **34**.

At this point, the rod **13** is provided the friction-lock device including parts **19**, **20** and **21**, previously described, and compression sleeve **20** is preloaded by the manual tightening of nut **21** upon threaded stud **17**. This friction-lock portion of the rod is introduced into the upper end at A of central tube **22**, and the diameter of tube **22** will be such that it will be nominally equivalent to the outside diameter of compression sleeve **20**. Hence, rotational displacements of rod **13** about its axis will provide a riding up or tightening of nut **21** upon stud **17**, thereby producing a radial expansion of compression sleeve **20** and a further locking of the device within central tube **22**. At this point, the microphone **10** may be attached to the ear **12** of rod **13** by the pivot attachments **15** being introduced through aperture **14** and clevis mount **11** in a con-

ventional manner. The microphone cord may either be disposed outside of the structure or, where desired, the cord may simply proceed upward through the microphone structure by using hollow bolts and studs as at **17** and **29**, a hollow base relative to **35**, and a hollow rod for rods **13**.

Experience has demonstrated that a very slight rotational displacement of rod **13** can be used either to secure or to loosen the height disposition of rod **13** within central sleeve **22**. This is very easily done and may be done by use of a single hand. Thus, rotational displacement of rod **13** in one direction will produce a loosening of the friction-lock device D by permitting a restoring of sleeve **30** to its original position upon a relative loosening of sleeve **20** nut **21** as accomplished through the slight rotational adjustment of rod **13**. Thereupon, the rod may be advanced upwardly or downwardly, as desired, and the user then, and simple with a slight rotation of rod **13** by his thumb and fingers, may return the friction-lock at sleeve **20** through a reverse rotation of the rod.

The structure thus indicates a microphone or other extensible structure wherein, by virtue of a manual manipulation of a single element, namely rod **13** or even microphone **10**, there may be provided a release of the friction-lock of the rod **13** and a corresponding resecurement thereof by use of but a single hand.

The present invention is ideally suited to microphone constructions but may be used in other contexts and constructions equally as well as in the case of extensible poles, legs, transit stands, camera or projector stands, extension pointers, and so forth.

While particular embodiments of the present invention have been shown and described, it will be obvious to those skilled in the art that changes and modifications may be made without departing from this invention in its broader aspects, and, therefore, the aim in the appended claims is to cover all such changes and modifications as fall within the true spirit and scope of this invention.

I claim:

1. An elongate construction including, in combination, a base support for disposition on and support by a ground plane, a tubular standard upstanding from said base support, a rod slideably disposed within said tubular standard, said rod having an upper end and a threaded lower end provided with reaction means, a radially expandable, axially compressible friction sleeve disposed over said lower end and frictionally engaging the interior of said tubular standard, and nut means threaded onto said lower end and backing said sleeve, for selectively compressing said sleeve against said reaction means, said nut means being advanceable against said sleeve upon the rotation of said rod relative to said tubular standard, wherein said base support includes a base having a central bore, a tubular stub securing said tubular standard, and friction-lock means securing said tubular stub to said base at said bore, and wherein said friction lock means comprises a bolt, first friction sleeve lock means disposed upon said bolt within said bore of said base, second friction sleeve lock means disposed upon said bolt within said tubular stub, means threaded upon said bolt for compression-locking said second friction sleeve lock means within said tubular standard, said tubular stub including a base portion threaded upon said bolt and comprising means for friction-locking said first friction sleeve lock means within said base.