

[54] **COMBINATION OF A BARBELL WITH WEIGHT AND COLLET DEVICE**

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285/330, 322, 323

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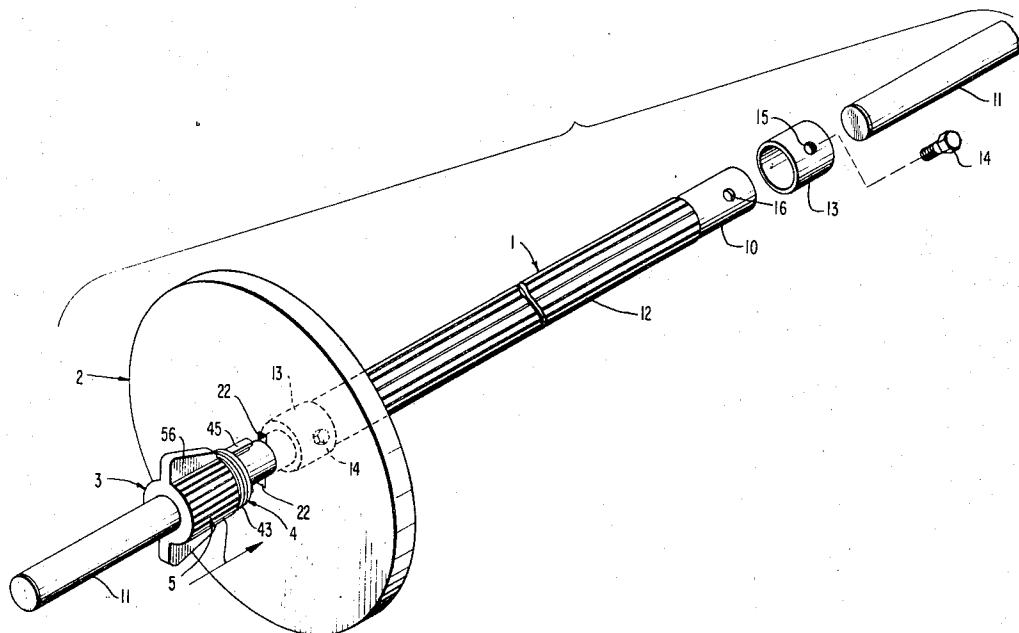
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[57] **ABSTRACT**

A collet device is disclosed for securing barbell weights on a bar. The device includes an inner member and an outer member, and is attached to the bar by the frictional engagement of the inner member with the bar. The outer member progressively threadably engages the inner member and compresses a portion thereof against the bar. The device also includes keys for engaging the weights to prevent them from rotating relative to the bar.

5 Claims, 6 Drawing Figures



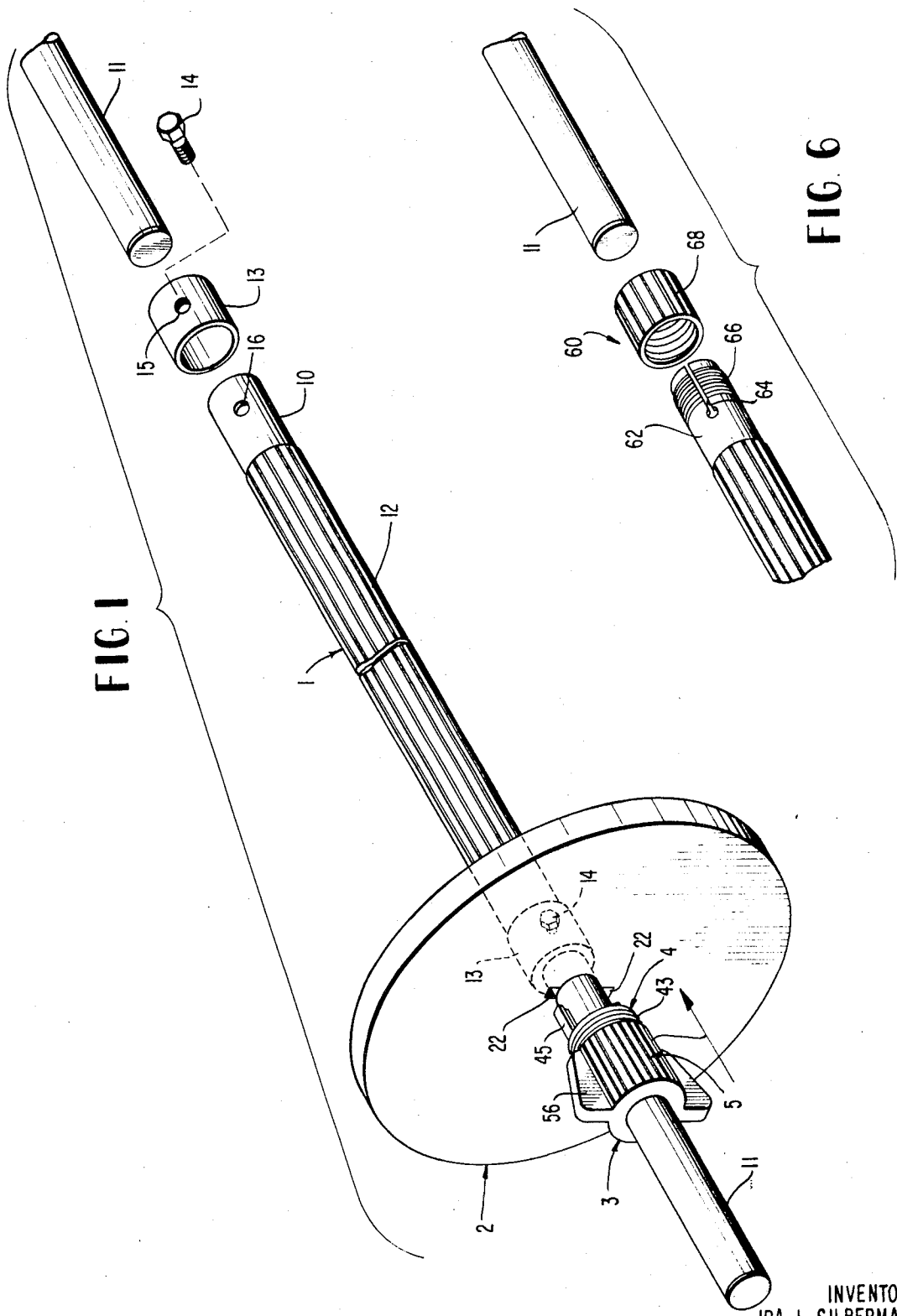
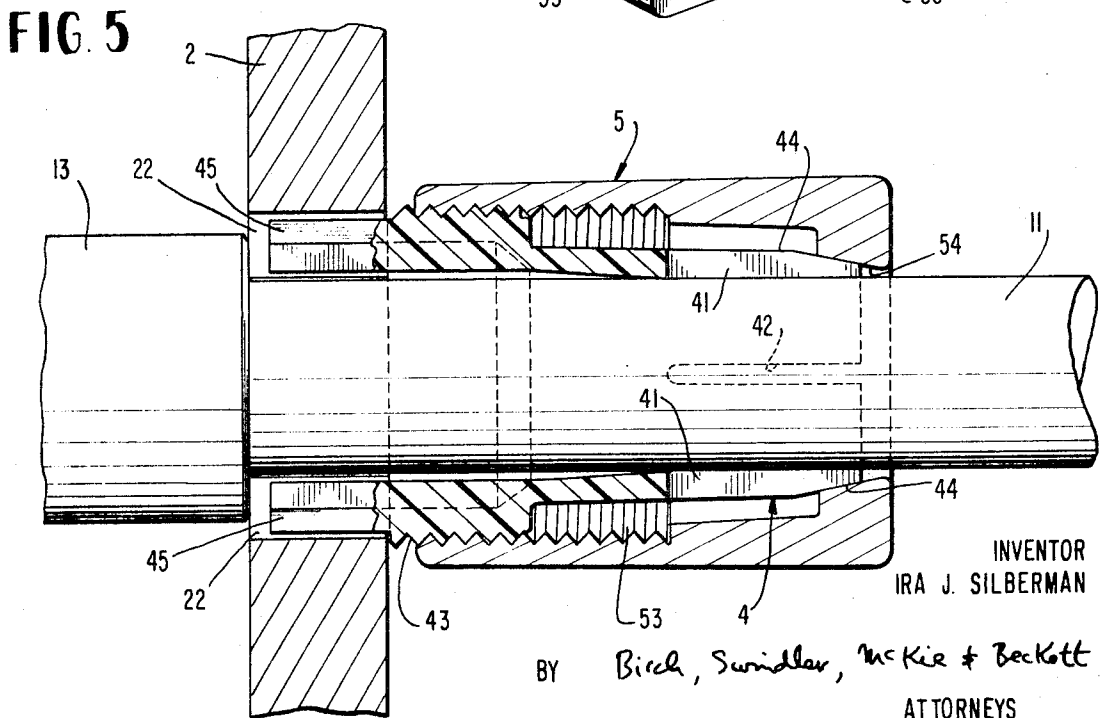
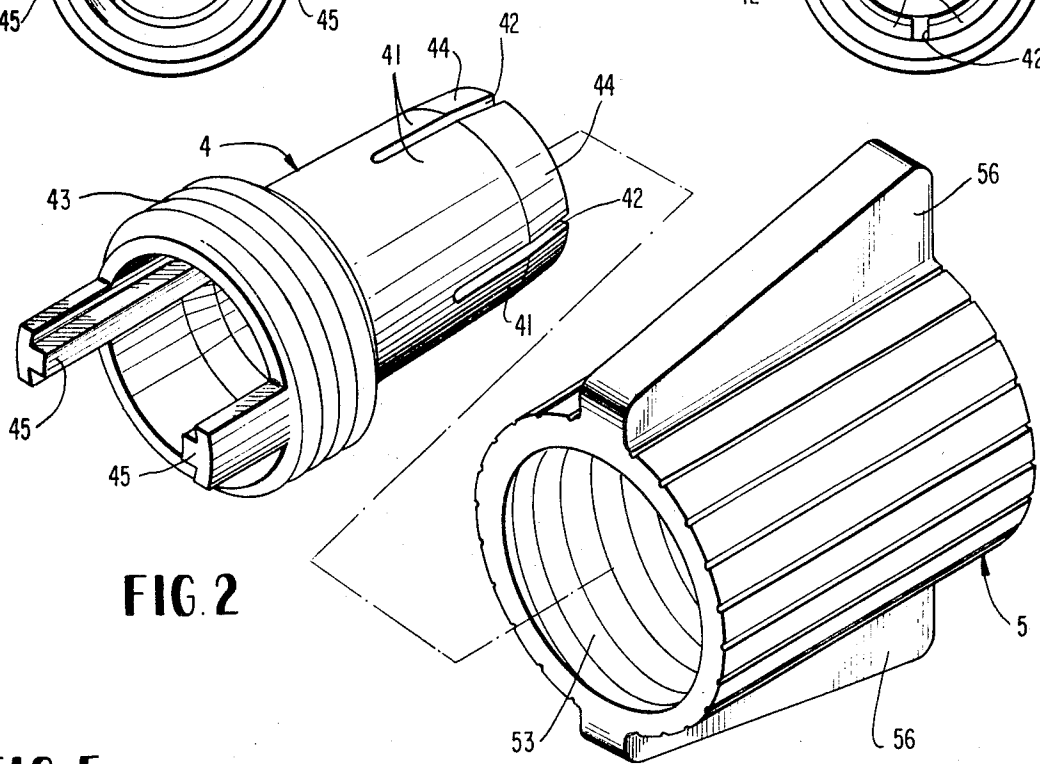
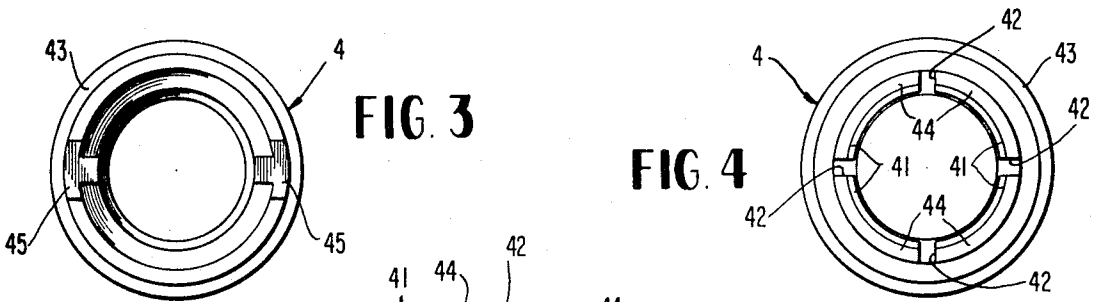


FIG. 1

FIG. 6

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COMBINATION OF A BARBELL WITH WEIGHT AND COLLET DEVICE

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to barbells, and specifically to a collet device for securing barbell weights on a bar.

2. Description of the Prior Art

Conventional barbells used for exercising purposes generally comprise a bar and a number of disc-like weights, each weight having an axially extending central opening therein through which the bar is received. Each weight is relatively heavy, and therefore must be secured firmly to the bar to avoid risk of injury to persons and property. Also, the weights frequently are changed to change the overall weight of the barbell. Further, it is desirable that the weights be prevented from rotating relative to the bar to provide the barbell with stability and reduce rattling of the weights during use of the barbell.

Previous devices used to secure barbell weights on a bar commonly include a collar and setscrew assembly. Such assemblies have not proved completely satisfactory because the forces required to secure the weights on the bar must be concentrated in the relatively small area defined by the tip of each screw. Consequently, a relatively large per unit area force must be applied by the screws to hold the weights in place frequently resulting in deformation of the bar or stripping of the threads on the screw or collar. Moreover, it is generally necessary to use a wrench or other tool to tighten and loosen the screws. The use of such a tool obviously is time consuming and annoying to a user.

One attempted solution to the use of conventional setscrews is an L-shaped setscrew, as shown in James U.S. Pat. No. 3,463,486. Although setscrews of this type are easier to manipulate than conventional setscrews, they introduce an additional disadvantage, namely a potentially hazardous projection extending outwardly from the associated collars. Moreover, a relatively large per unit area force also must be applied by L-shaped setscrews resulting in the attendant disadvantages mentioned above.

In addition to collar and setscrew assemblies, cam-action clamps have been used to secure barbell weights on a bar, as shown in Venables U.S. Pat. No. 2,224,351. Clamps of this type usually include a handle or lever which protrudes outwardly from the barbell and therefore is potentially hazardous. Also, such clamps may be released accidentally when snagged on a foreign object or when the barbell is dropped accidentally.

With the foregoing in mind, it is an object of the present invention to provide an improved device for securing barbell weights on a bar, which device is effective and safe.

It is another object of the invention to provide a collet device for securing barbell weights on a bar, which device can be attached and released easily and rapidly.

It is yet another object of the invention to provide a collet device for securing barbell weights on a bar, which device has no potentially hazardous protruding parts.

It is a further object of the invention to provide a collet device for securing barbell weights on a bar, which device is not subject to accidental release.

It is yet a further object of the invention to provide a collet device for securing barbell weights on a bar, which device does not require the use of any supplementary tools for attachment or release.

It is an additional object of the invention to provide a collet device for securing barbell weights on a bar, which device distributes the forces required to secure the weights on the bar over a relatively large area.

It is yet an additional object of the invention to provide a collet device for securing barbell weights on a bar, which device does not deform the bar.

It is also an object of the invention to provide a collet device for securing barbell weights on a bar, which device prevents the weights from rotating relative to the bar.

These and other objects of the invention are achieved by providing a collet device for securing a barbell weight on a bar comprising; an inner member adapted to fit onto the bar and including an externally threaded portion and a compressible portion having at least one longitudinally extending slot therein; an outer member adapted to fit around said inner member and including an internally threaded portion engageable with the externally threaded portion of the inner member and a compressing portion engageable with the compressible portion of the inner member, at least one of said compressible and compressing portions comprising a tapered surface so that when the threaded portions of the inner and outer members progressively are engaged, said compressing portion progressively engages said compressible portion and said compressible portion is compressed against the bar; and means affixed to one of said inner and outer members and engageable with the weight to prevent the weight from rotating relative to the bar.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view, partially exploded, of a barbell, including a demountable bar, a weight on the bar and the collet device of the invention slightly offset from the normal position thereof adjacent the weight;

FIG. 2 is an exploded perspective view of the collet device of the invention;

FIG. 3 is an end view of the inner member of the collet device shown in FIG. 2;

FIG. 4 is an opposite end view of the inner member of the collet device shown in FIG. 2;

FIG. 5 is a sectional view showing a portion of a barbell, including a bar, a weight on the bar and the collet device of the invention securing the weight on the bar; and

FIG. 6 is an exploded perspective view of a second embodiment of a demountable bar.

DESCRIPTION OF THE PREFERRED EMBODIMENT

A barbell is shown in FIG. 1, including a demountable bar 1, a disc-shaped barbell weight 2 and a collet device 3 for securing weight 2 on bar 1. Bar 1 comprises a central tube 10 and two end bars 11 which are adapted to be telescopically received in the ends of tube 10. A knurled sleeve 12 is placed over tube 10 to facilitate gripping and lifting the bar. A locking collar 13 fits over each end of tube 10 and includes a threaded opening 15 for receiving a setscrew 14

therein. Screws 14 are threadably inserted through openings 15, inserted through aligned openings 16 in tube 10, and engage the inner ends of end bars 11 to secure the end bars to tube 10.

End bars 11 are adapted to supportingly engage weights 2. Weights 2 each have an axially extending central opening therein through which one of bars 11 is slidably received. The weights are slid inwardly on bars 11 until they abut collars 13 or another weight, and are secured to the bars by collet device 3, the collet device of the invention.

Collet device 3 includes an inner member 4 and an outer member 5, and may be made from any suitable material, such as plastic or metal. Inner member 4 (FIGS. 2-5) is basically tubular-shaped and has an inside diameter only slightly larger than the diameter of end bars 11. Member 4 includes an externally threaded portion 43 adapted to be engaged by outer member 5, as described hereinbelow.

Member 4 also includes a compressible portion comprising a plurality of deformable sections 41 disposed between and defined by a plurality of longitudinally extending slots 42. Sections 41 are adapted to be compressively deformed inwardly and frictionally engage one of bars 11 to secure weights 2 on bar 1. The number of sections 41 and slots 42 formed in member 4 is a matter of design choice. Similarly, the length of the slots is optional. However, the longer the slots, the greater will be the inner surface area of sections 41, and thus the lower will be the per unit area force required to secure weights 2 on bar 1. Sections 41 include tapered end surfaces 44 which facilitate progressive compressive deformation of the sections upon the engagement of outer member 5 therewith, as described hereinbelow.

Inner member 4 further includes a pair of longitudinally extending fingers or keys 45 adapted to engage weights 2. Each weight 2 includes a pair of diametrically opposed notches 22 formed adjacent the central opening therein. Fingers 45 are receivable in notches 22 to prevent the weights from rotating relative to bar 1.

Outer member 5 (FIGS. 2 and 5) includes an internally threaded portion 53 which is adapted to engage threaded portion 43 of inner member 4 when device 3 is attached to bar 1.

Outer member 5 also includes a compressing portion defined by an annular tapered surface 54 (FIG. 5). Surface 54 is adapted to progressively engage surfaces 44 of inner member 4 when threaded portion 53 engages threaded portion 43. Although in the preferred embodiment of the collet device of the invention, surfaces 44 and 54 both are tapered, only one of such surfaces need be tapered for the proper functioning of the device.

Outer member 5 further includes a pair of radially extending, diametrically opposed flanges 56 formed on the exterior of the member to facilitate manipulation thereof.

The assembly of the barbell, including device 3 will now be described. Central tube 10 is first inserted into knurled sleeve 12. End bars 11 are then inserted into tube 10 and secured thereto with collars 13 and set-screws 14.

A weight 2 is then placed on one of bars 11, and one of devices 3 placed on the same bar with the fingers 45 thereof extending inwardly toward the weight. During assembly, threaded portions 43 and 53 are engaged only sufficiently to permit device 3 to be positioned as a single unit. Device 3 is then slid along bar 11 until the inner surface of the weight abuts the associated collar 13, and fingers 45 are fully inserted into notches 22. Outer member 5 is then rotated and tightened onto inner member 4 by manipulating flanges 56. While member 5 is being tightened onto member 4, the latter is held against rotation by holding weight 2 with which member 4 is engaged. As portions 43 and 53 progressively are engaged, tapered surface 54 progressively engages and compresses tapered surfaces 44 to thereby compressively deform sections 41 inwardly against bar 11. The compressible portion of inner member 4 thus frictionally engages bar 11 to secure weight 2 on the bar. As will be apparent, device 3 prevents the weight from moving axially or rotationally relative to the bar. A similar procedure is then followed for securing a weight 2 on the other end bar 11.

To release device 3 for the purpose of adding, removing or exchanging weights, outer member 5 is simply rotated in the opposite direction until surface 54 disengages surface 44 sufficiently to relieve the compression forces applied to the compressible portion of inner member 4. While member 5 is being untightened from member 4, the latter is again held against rotation by holding weight 2. Device 3 can then be removed from the bar easily.

An alternate embodiment of a demountable bar is shown in FIG. 6, as designated by reference numeral 60. Bar 60 includes a central tube 62 which is adapted to telescopingly receive end bars 11 in the opposite ends thereof. Tube 62 is provided with at least one longitudinally extending slot 64 in each end thereof. Also, each end of the tube is externally threaded, as at 66. A cylindrically shaped, internally tapered and threaded compression nut 68 is adapted to engage threads 66 to compressively deform the associated end of tube 62 inwardly and thereby clamp bar 11 in tube 62.

While the foregoing constitutes a detailed description of the collet device of the invention and a barbell in which such device may be employed, it is recognized that various modifications thereof will occur to those skilled in the art. For example, a plurality of separate shim-like pieces may be substituted for inner member 4. Such pieces would be configured similarly to the individual sections which would result if slots 42 extended the full length of member 4. Alternatively, only one of the slots may extend the full length of member 4, resulting in a single wrap-around member. In either of the above embodiments, the operation of the inner member is the same as the operation of inner member 4. Also, means engageable with the weights other than fingers 45 may be affixed to the inner or outer member for preventing the weights from rotating relative to the bar. For example, such means may be engageable with sockets formed on the outer surface of the weights. Therefore, the scope of the invention is to be limited solely by the scope of the appended claims.

I claim:

1. In a barbell, the combination comprising a bar, at least one weight adapted to fit on said bar, and a collet

device for securing said weight on said bar; the improvement wherein said collet device comprises;

a first means for lockably attaching the weight to the bar,

said first means telescoping on the bar and said first means including an externally threaded portion and a compressible portion at the other end and having at least one longitudinally extending slot therein;

a second means telescoping over the bar for compressibly engaging said compressible portion of said first means, said second means including an internally threaded portion threadably engaging said externally threaded portion and said second means having at one end a portion compressible engaging said compressible portion, at least one of said compressible and compressing portions having a tapered surface engageable with the other of said compressible and compressing portions so that when said threaded portions progressively are engaged, said compressing portion progressively engages said compressible portion and said compressible portion is compressed against said bar; and

a third means affixed to said first means and engaging said weight for prevent the weight from rotating relative to said bar, said third means extending longitudinally from the end opposite the end with the compressible portion of said first means and keyed to the weight on the bar.

2. A barbell as recited in claim 1, wherein said bar is demountable.

3. A barbell as recited in claim 2, wherein said bar comprises a central tube, a pair of end bars telescopingly receivable in the ends of said tube, and means for securing each of said end bars to said tube.

4. A barbell as recited in claim 3, wherein said means for securing said end bars comprises a collar adapted to fit around said central tube and a set-screw insertable through said collar and said central tube and engageable with one of said end bars.

5. A barbell as recited in claim 3, wherein said securing means comprises at least one longitudinally extending slot in an end of said central tube, an externally threaded portion formed on said tube end and a nut engageable with said threaded portion for compressing said tube end against one of said end bars.

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