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Speyer

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[54] **BARBELL WITH REMOVABLE WEIGHTS**

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Related U.S. Application Data

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[52] **U.S. Cl.**..... **272/84,** 287/DIG. 8, 177/191

[51] **Int. Cl.**..... **A63b 11/02**

[58] **Field of Search**..... 272/81, 84; 177/191, 248, 177/250, 252, 256–258; 161/7; 287/DIG. 8; 403/350, 351

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[57] **ABSTRACT**

A barbell exercising device having weights adapted for mounting on a barbell. Each weight has a circular shape and a centrally disposed, axially aligned bore formed therein, and includes walls defining a radial slot extending from the bore to the periphery of the weight with the walls defining the slot being disposed at an angle with respect to the axis of the bore. The radial slot in each weight allows the weight to be mounted on a barbell and demounted therefrom without removing a collar or other weight retaining device by passing the barbell through the canted slot of the weight and then aligning the barbell with the axially aligned bore of the weight. A barbell is provided for supporting the weights which includes a hollow rod having flanges affixed to each of its terminal ends and a pair of bar members. Each bar member is partially, telescopingly insertable into the rod and has locking means affixed thereto for retaining each bar member in the hollow interior of the rod and retarding movement of the bar member axially of the rod. Protuberances formed on flanges positioned on the barbell, the rod and a weight form castellated mating surface portions capable of interengaging in antirotational relationship.

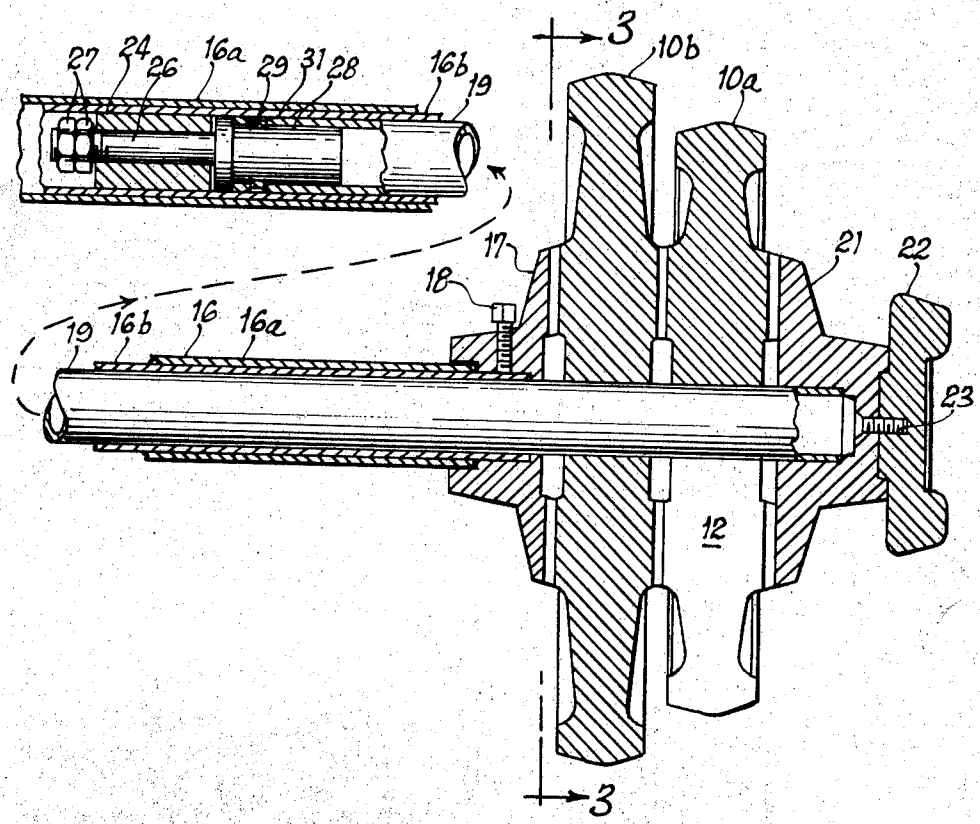
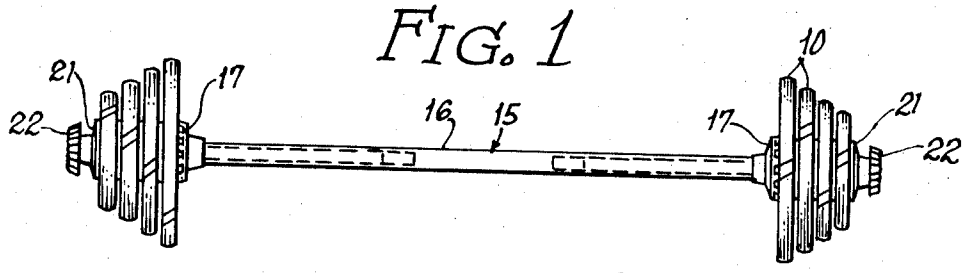


FIG. 1



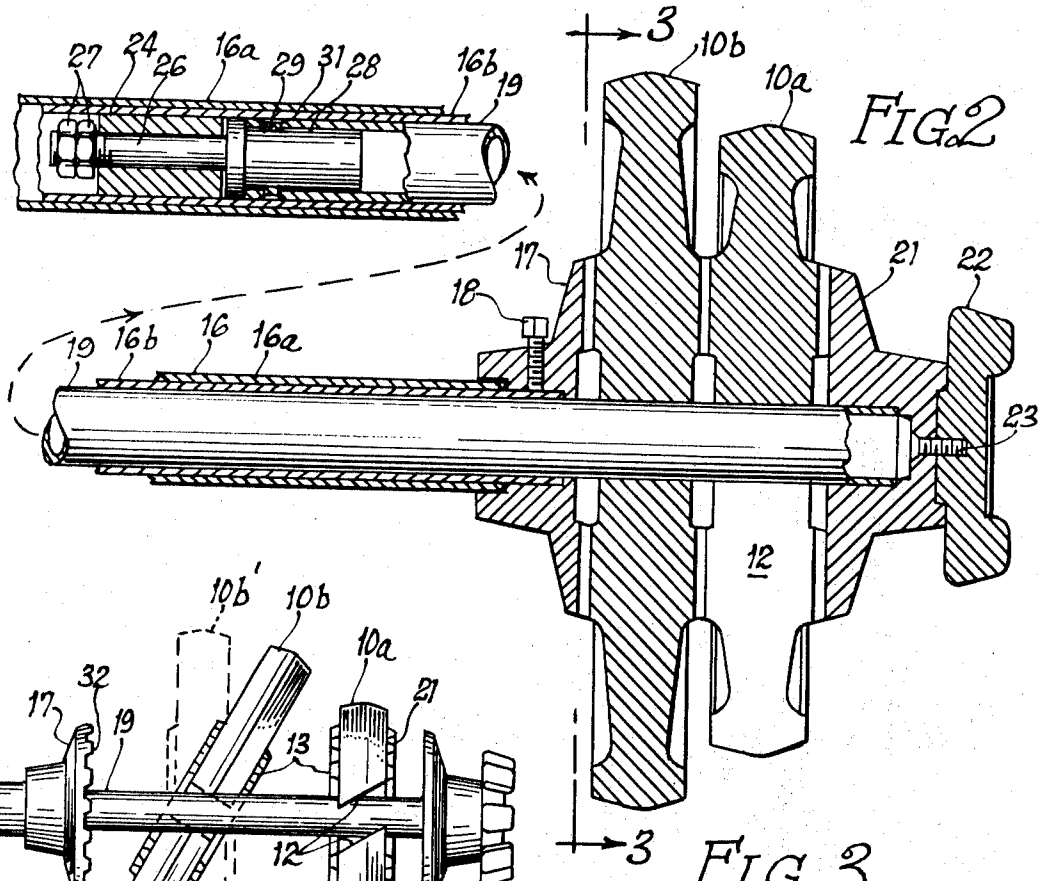


FIG. 2

FIG. 4

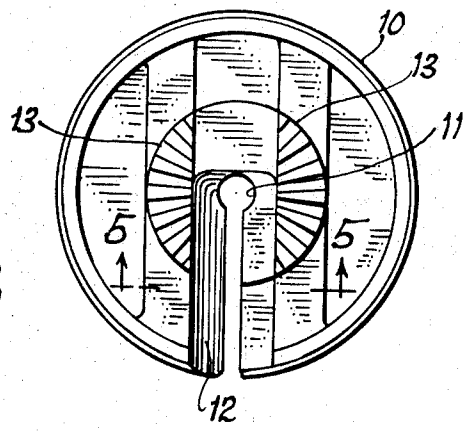


FIG. 3

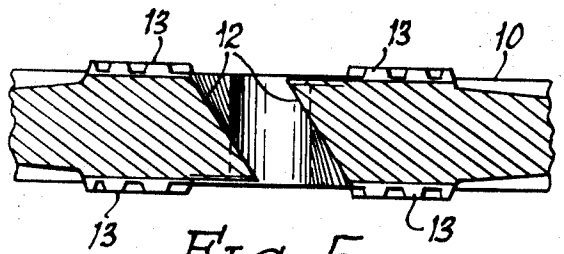


FIG. 5

FIG. 6

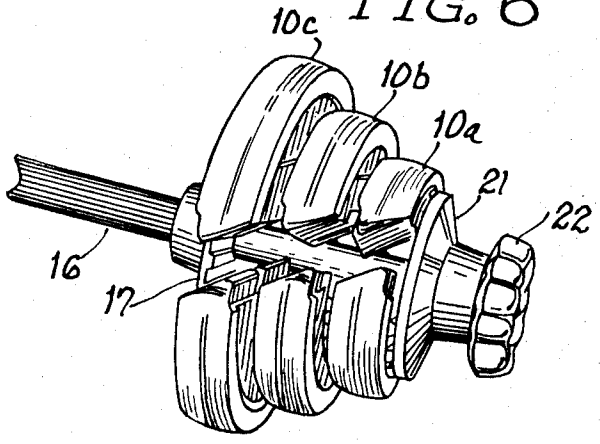
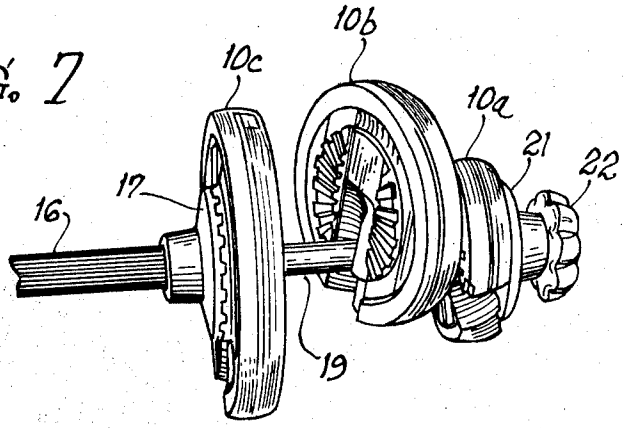


FIG. 7



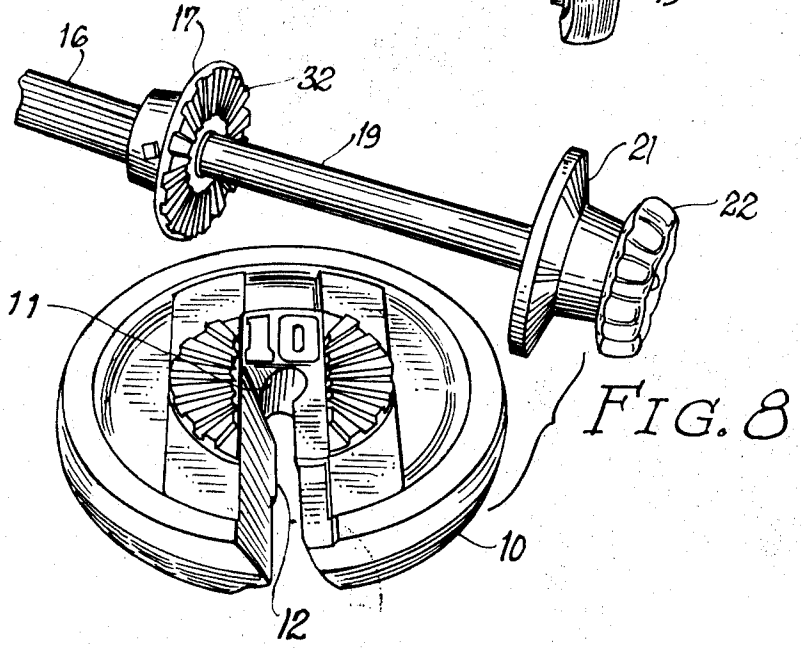


FIG. 8

BARBELL WITH REMOVABLE WEIGHTS

This is a division, of application Ser. No. 267,696, filed June 29, 1972, now Pat. No. 3,771,785.

BACKGROUND OF THE INVENTION

The present invention relates to barbells and weights therefor. The use of barbells and weights for exercising is known throughout the world. However, the known devices require the removal of collars at either end of the barbell or bar in order to add weights to the barbell by passing the bar through a centrally disposed bore in the weight. Similarly, removal of weights from the bar requires removal of the collar from the bar followed by pulling the weight axially off the bar. In the past, considerable time and effort was required to loosen and demount the collar in order to add or to subtract weights from the bar. More recently, snap-action type locking devices have been utilized to decrease the amount of effort required to loosen the collar prior to removal of the collar. However, even with these improvements, the collar must be removed from the bar and the weight slipped on or off the end of the bar.

SUMMARY OF THE INVENTION

An object of this invention is the provision of a combination of barbell and weight wherein the weight can be mounted on or demounted from the barbell without removal of weight retaining means, such as a collar.

Another object of the invention is the provision of a combination of barbell and weights wherein the weights each have a canted slot extending from the periphery of the weight to the bore through the center of the weight. The weights are mounted on a rod that telescopes into the hollow end of the barbell. The telescoping ends of each rod has a cam type locking device whereby rotation of the telescoped end of the rod will cause the locking device to engage the barbell and lock thereto. Protuberances formed on the flanges on the barbell, the rod and the weights form castellated mating surface portions capable of interengaging in anti-rotational relationship.

Further objects and advantages of this invention will become apparent from the following description when the same is considered in connection with the accompanying drawings.

In accordance with the present invention there is provided a barbell weight having a centrally disposed, axially aligned bore and a substantially radial slot formed therein whereby the weight is mountable on a barbell by passing the barbell through the slot formed in the weight. The walls defining the radial slot extend from the bore to the periphery of the weight and are disposed at an angle with respect to the axis of the bore. In the use of the weight, the weight can be mounted on or demounted from the barbell by canting the weight with respect to the axis of the barbell and passing the barbell through the radial slot in the weight. In mounting the weight on a barbell, upon the barbell reaching the bore of the weight, the weight is cammed along the junction between the walls defining the slot and the bore into axial alignment with the barbell, thus seating the bore of the weight about the barbell. The mounted weight is retained on the barbell by providing a force longitudinally to the axis of the barbell to prevent the canting of the weight by being cammed by the barbell passing through the junction between the bore and the

walls defining the radial slot. By providing the longitudinal force, the weight cannot accidentally slip or fall from the barbell in use or upon other movement as the passage of the barbell through the canted, radial slot is prevented by the surface formed at the junction of the radial slot and the bore. The weight can also be retained on the barbell by gravity by providing at least one portion of greater density than the density of the remainder of the weight near the periphery of the weight adjacent the slot.

The present invention further provides a barbell in combination with the weight, the barbell being adapted for supporting a plurality of the weights adjacent the ends thereof. The barbell comprises a hollow rod having a flange affixed at each of its terminal ends and a pair of bar members insertable into the rod and adapted to have a plurality or weights mounted thereon. Each of the flanges affixed to the rod has a central bore formed therethrough. Each bar member has a flange affixed to one end thereof and further has locking means affixed to the bar member for retaining the bar member in the hollow interior of the rod and retarding movement of the bar member axially of the rod.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is an elevational view showing weights of the present invention mounted on a barbell.

FIG. **2** is a vertical cross-sectional view, on an enlarged scale, of two weights and one end of the barbell shown in FIG. **1.**

FIG. **3** is an end elevational view of a weight as described herein, on a reduced scale, taken substantially on line **3—3** of FIG. **2.**

FIG. **4** is an elevational view of one end of the barbell assembly shown in FIG. **1** with a first weight mounted on the barbell, and with a second weight being partially mounted on the barbell and with the fully mounted position of the weight being shown in broken lines, the slots of the weights being horizontally disposed.

FIG. **5** is a cross-sectional view, on an enlarged scale, taken substantially on line **5—5** of FIG. **3.**

FIG. **6** is a perspective view of one end of the barbell shown in FIG. **1,** having three weights mounted thereon, the slots of the weights being horizontally disposed.

FIG. **7** is a perspective view of the barbell and weights shown in FIG. **6,** with the weights being rotated approximately 90° and with one weight being partially demounted from the barbell.

FIG. **8** is a perspective view of the barbell shown in FIG. **1** with a weight in accordance with the present invention lying in a demounted position.

BRIEF DESCRIPTION OF A PREFERRED EMBODIMENT

In the particular construction shown in the drawings, the numeral **10** indicates, generally a weight adapted for mounting on a barbell in acoordance with the present invention. Weight **10** is generally circular in shape and has a centrally disposed, axially aligned bore **11** formed therein. Weight **10** further has walls **12** which define a radial slot extending from bore **11** to the periphery of weight **10.** Walls **12** are disposed at an angle with respect to the axis of bore **11** of weight **10** for a purpose to be hereinafter described. Preferably walls **12** defining the radial slot are disposed at an angle

greater than 0° and less than 90° from the axis of bore **11.** Walls **12** are preferably spaced apart at least a distance substantially equal to the diameter of bore **11** and are substantially parallel, although walls **12** may be divergent from their junction with bore **11** to the periphery of weight **10.** Weight **10** preferably has spaced radial protuberances **13** on the substantially planar surfaces thereof. Protuberances **13** are designed for interengagement with surfaces having substantially identical protuberances, such as other weights **10.** Preferably, protuberances **13** form a castellated surface capable of meshing with substantially identical castellated surfaces.

The present invention includes an assembly formed of one or more weights **10** with a barbell indicated generally by numeral **15.** Barbell **15** includes a rod **16** having a hollow interior. Rod **16** can be of any desired shape and preferably is circular in cross-section and has a circular bore as its hollow interior. In the embodiment shown in FIG. **2,** rod **16** comprises two concentric tubular members **16***a* and **16***b*, wherein member **16***a* is a rod freely rotatable about member **16***b* and flanges **17.** Flanges **17** are each secured to rod **16***b* by means of at least one bolt or screw **18** and each has a central bore formed therethrough.

Barbell **15** further includes a pair of bar members **19,** each being adapted to have a plurality of weights **10** mounted thereon. Each of bar members **19** are partially, telescopingly insertable into rod **16** as illustrated in FIG. **2.** Each of the bar members **19** has a flange **21** affixed to one end thereof. Flange **21** preferably has a knob portion **22** adapted for gripping for manual rotation of the bar member **19** to which the flange is affixed. Knob portion **22** is secured to flange **21** by means of a screw **23.**

Each of bar members **19** is provided with locking means affixed thereto for retaining the bar member within the hollow interior of rod **16** and for retarding movement of the bar member axially of rod **16.** In the preferred embodiment shown in the drawings, the locking means comprises a camming member **24** which is eccentrically journalled on the end of bar member **19** opposed from the end thereof bearing flange **21.** Camming member **24** is rotatable about threaded stud **26** and is held thereon by means of a pair of nuts **27** threaded onto the end of stud **26.** Bar member **19** can be formed of a suitable material such as steel, and can be either solid or tubular. Stud **26** can be affixed to bar member **19,** particularly if the latter is tubular, by affixing stud **26** to a solid bar portion **28,** inserting bar portion **28** into the end of bar member **19,** and crimping or deforming bar member **19** against bar portion **28,** as at **29.** Bar portion **28** may have an annular depression **31** to facilitate crimping bar member **19** thereagainst.

Preferably, the cross-sectional dimensions of camming member **24** are substantially equal to the cross-sectional dimensions of bar member **19** to which it is affixed to enable insertion of camming member **24** and the adjacent end of bar member **19** into the hollow interior of rod **16** when camming member **24** is aligned with bar members **19.** Following insertion, camming member **24** is lockingly engagable with the interior of rod **16,** by friction, in response to rotation of bar member **19** in either direction with respect to rod **16.** Thus, the largest cross-sectional dimension of bar member **19** and camming member **24** should be slightly smaller than the cross-sectional dimensions of the hollow interior of rod **16** to permit bar member **19** and camming member **24** to be inserted into rod **16** while permitting the locking engagement of camming member **24** to the interior of rod **16** by friction as bar member **19** is rotated.

As barbell **15** forms an exercising device assembly in combination with one or more weights **10,** it is preferred to have the outer periphery of bar member **19** corresponding in configuration and be slightly smaller than bore **11** and the radial slot formed by walls **12.**

In accordance with the present invention, weight **10** is mounted on bar member **19** of barbell **15** by passing bar member **19** through the slot defined by walls **12** and seating bar member **19** in bore **11.** Similarly, weight **10** is removed from barbell **15** by causing bar member **19** to pass through the slot defined by walls **12** from bore **11** past the periphery of weight **10.**

In the mounted condition, weight **10** is clamped between flanges **17** and **21** to resist accidental demounting of weight **10** from barbell **15** upon use or other movement of the combination. Weight **10** is particularly resistant to accidental demounting from barbell **15** due to the radial slot defined by walls **12** being disposed at an angle to bore **11.** Thus, when bore **11** is seated about bar member **19,** weight **10** cannot be removed from bar member **19** unless weight **10** is angled and withdrawn slightly from bar member **19** to align bar member **19** with the slot defined by walls **12.** Only a relatively small longitudinal force is required to prevent the canting or angling of weight **10** thereby effectively preventing the accidental demounting of weight **10.** Barbell **15,** and its locking means provided by camming member **24** frictionally engaging the hollow interior of rod **16,** has been found to effectively provide the longitudinal force required to prevent accidental demounting.

Although resistance to accidental demounting of weight **10** from barbell **15** is provided by the clamping action between flanges **17** and **21** of barbell **15,** a positive weight retaining action and prohibition of rotation of the weights on barbell **15** is provided by having spaced radial protuberances **32** formed on the outwardly facing surfaces of flanges **17.** Protuberances **32** are substantially identical to and are adapted to mesh and interengage with the radial protuberances **13** formed on weight **10.** By providing mating protuberances **13** and **32,** weight **10** is held in locking and anti-rotational engagement upon the clamping of weight **10** between flanges **17** and **21.** Preferably, protuberances **32** and also protuberances **13** form castellated mating surface portions capable of interengaging in anti-rotational relationship. Since both substantially planar surfaces of weight **10** have protuberances **13** formed thereon, additional weights **10** can be held in anti-rotational locked arrangement by having the protuberances **13** on each subsequent weight interengage the protuberances **13** on each preceding weight. In this manner, a plurality of weights **10** are mountable on barbell **15** in anti-rotational relationship and are protected against accidental demounting by the interengagement of their respective protuberances **13,** the interengagement of the protuberances **13** formed on one substantially planar surface of one of the weights **10** with the protuberances **32** formed on flange **17,** and the clamping action on the weights between flanges **17** and **21** due to bar member **19** being inserted into rod **16** to the

fullest extent permitted by the presence of the weights **10** and by being lockingly engaged with the interior of rod **16.**

Additional resistance to the demounting of weight **10** from barbell **15** is provided by having the density of weight **10** vary so that portions of greater density are placed near the periphery of the weight adjacent to or in proximity of the radial slot defined by walls **12.** The portions of greater density will seek a downward orientation on barbell **15** due to the force of gravity, maintaining the radial slot in vertical downward-facing orientation. Thus, under the majority of conditions, weight **10** will be held on barbell **15** by gravity even where the clamping action on the action of mating protuberances **13** or **13** and **32** are temporarily suspended, such as during the mounting or demounting operations. The portions of greater gravity can be provided, for example, by boring holes in weight **10** adjacent the walls **12** defining the slot and filing these holes, such as by casting, with material of greater density, such as lead, than the density of the material comprising the remainder of weight **10,** which may generally comprise, steel, concrete, iron, and the like.

The operation of mounting or demounting a weight **10** with respect to barbell **15** is illustrated in FIG. **4.** To prepare barbell **15** for either mounting or demounting of a weight, such as weight **10*b***, knob portion **22** of flange **21** is rotated in a direction opposite to the direction utilized in locking bar member **19** to rod **16** to cause camming member **24** to release its frictional hold on the interior of rod **16.** Bar member **19** is then axially withdrawn from rod **16,** for example, by pulling knob portion **22** away from flange **17.** Bar member **19** need only be axially withdrawn from rod **16** a distance to provide release of protuberances **13** of weight **10*b*** from engagement with protuberances **32** on flange **17** and from engagement with protuberances **13** on other weights, such as weight **10*a*** and to permit canting or angling of weight **10*b*** to align the slot formed by walls **12** with the axis of bar member **19.** Barbell **15** is now prepared for mounting or demounting of weights. In demounting, weight **10*b*** is pulled from bar member **19** at the periphery of weight **10*b*** at a point diametrically opposed to the slot formed by walls **12.** Upon the initial pulling of the weight **10*b***, the weight is cammed along the junction of walls **12** with bore **11** of the weights causing weight **10*b*** to be canted from its mounted position **10*b*** to the position shown in FIG. **4** with the walls **12** of the weight being aligned with the axis of bar member **19.** Continued pulling of the weight causes bar member **19** to pass through the slot formed by walls **12.** After bar member **19** has cleared the open end of the slot formed by walls **12,** the weight **10*b*** is fully demounted. Where weight **10*b*** is mounted between two weights, **10*a*** and **10*c***, as shown in FIG. **6,** bar member **19** need be axially withdrawn from rod **16** only to the extent necessary to permit disengaging of protuberances **13** on weight **10*b*** from the protuberances on each of weights **10*a*** and **10*c*** and to permit the canting or angling of weight **10*b*** as shown in FIG. **7.** In mounting a weight such as weight **10*b***, the operation is reversed in that bar member **19** is again withdrawn from rod **16** to the extent described, the weight **10*b*** is aligned with bar member **19** so that the slot formed by walls **12** is in axial alignment with the bar member and the weight is applied to the bar member by passing the bar member through the slot as illustrated in FIG. **7.** Upon reaching the interior end of the slot, weight **10*b*** is cammed along the surface of the junction between the radial slot formed by walls **12** and the bore **11** to axially align weight **10*b*** with bar member **19.** Thereafter the bar member is inserted into rod **16** to the fullest extent permissible by the presence of weight **10*b*** and other weights, the protuberances of the weights are interengaged and the protuberances **13** of weight **10*c*** is interengaged with protuberances **32** of flange **17,** followed by the locking of bar member **19** to rod **16** by rotating bar member **19** in either direction, for example, by the manual rotation of knob **22.** In this manner, weight **10*b*** can be readily mounted or demounted on bar member **19** without the removal of a collar or other weight retaining device from barbell **15,** and upon completion of the mounting is securely held in non-rotational engagement on the bar member whereby accidental demounting is prevented.

Various changes coming within the spirit of my invention may suggest themselves to those skilled in the art; hence, I do not wish to be limited to the specific embodiments shown and described or uses mentioned but intend the same to be merely exemplary, the scope of my invention being limited only by the appended claims.

I claim:

1. An exercising device comprising in combination:

a. a hollow rod having a flange affixed at each of its ends, said flanges having a central bore formed therethrough;

b. a pair of bar members each bar member being adapted to have a plurality of weights mounted thereon and each being partially, telescopingly insertable into said rod, each of said bar members having a flange affixed to one end thereof and having locking means affixed to said bar member for retaining said bar member in the hollow interior of said rod and retarding movement of said bar member axially of said rod; and

c. at least one barbell weight having a circular shape and a centrally disposed, axially aligned bore formed therein, said weight having walls defining a radial slot formed in said weight extending from said bore formed therein to the periphery of said weight, said walls defining said slot being disposed at an angle to the axis of said bore formed in said weight, whereby said weight is mountable on either of said bar members by passing said bar member through said slot formed therein.

2. The exercising device of claim **1** wherein said locking means comprises an eccentrically journalled, rotatable camming member affixed to the other end of each of said bar members, said camming member having its cross-sectional dimensions substantially equal to the cross-sectional dimensions of each said bar member, whereby each of said bar members and its affixed camming member are insertable into the hollow interior of said rod with said camming members being lockingly engageable in weight retaining relation with said rod in response to rotation of said bar members in either direction with respect to said rod.

3. The exercising device of claim **1** wherein each said flange affixed to said rod and said weight have substantially identical, spaced radial protuberances on the interengaging surfaces thereof, whereby said weight is lockingly and anti-rotationally clampable on either of

said bar members between one of said flanges affixed to said rod and the flange affixed to said bar member.

4. The exercising device of claim **3** wherein said protuberances formed on said flanges and said weight form castellated mating surface portions capable of interengaging in anti-rotational relationship.

5. The exercising device of claim **1** wherein each said flange affixed to each of said bar members includes a knob portion adapted for gripping for manual rotation of said bar member.

6. The exercising device of claim **1** including a plurality of said weights.

7. The exercising device of claim **6** wherein said walls defining said slot of each of said plurality of weights are disposed at an angle greater than 0° and less than 90° to the axis of said bore formed in said weight.

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