Jan. 25, 1966 M. WINER 3,231,270

BAR BELL HAVING COLLAPSIBLE CHAMBERS

Filed July 23, 1962

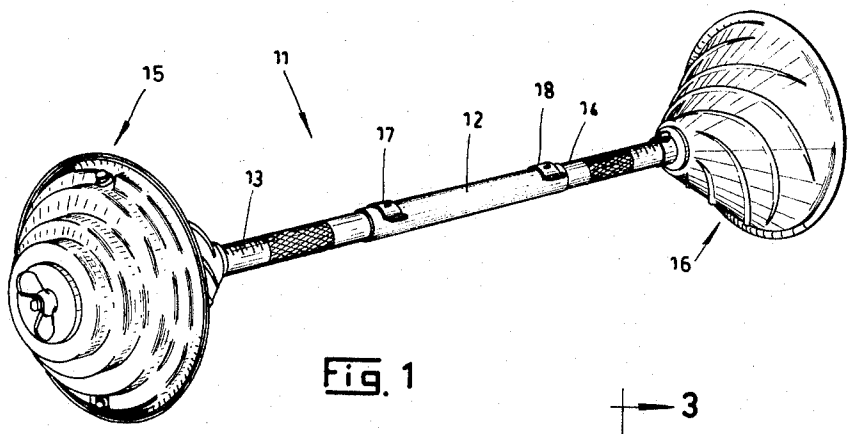


Fig. 1

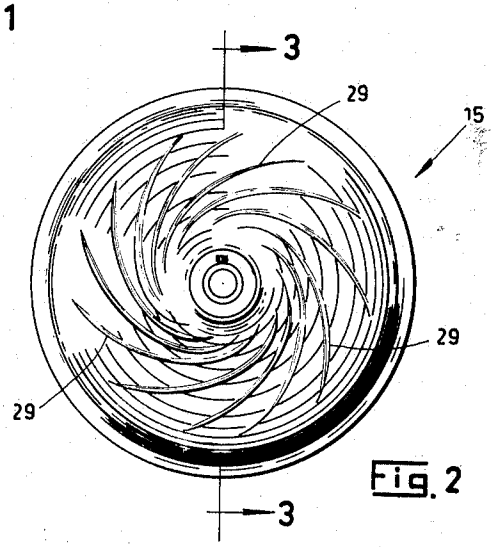


Fig. 2

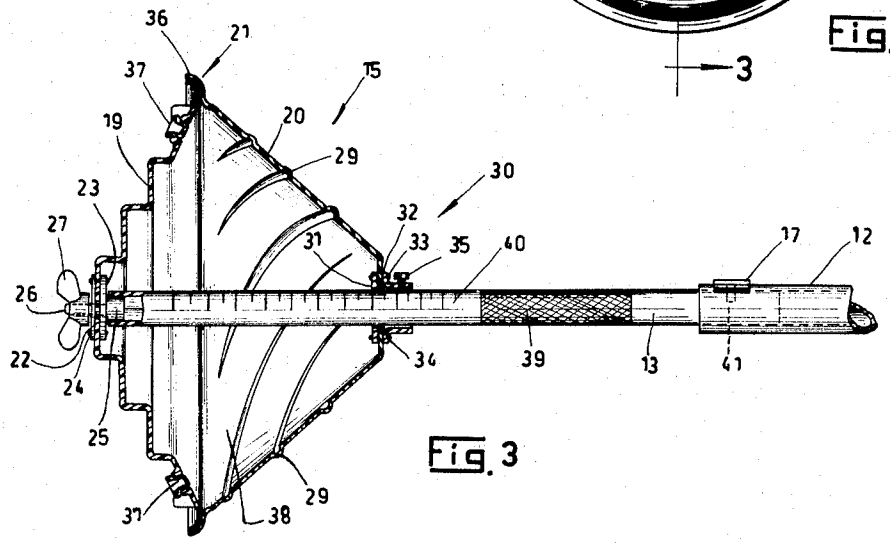


Fig. 3

United States Patent Office

3,231,270

Patented Jan. 25, 1966

3,231,270

BAR BELL HAVING COLLAPSIBLE CHAMBERS

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Filed July 23, 1962, Ser. No. 211,911
2 Claims. (Cl. 272—84)

This invention relates to weight-lifting devices of the type having means of varying the weight in order to meet the needs of an individual athlete.

It is common practice in providing a set of exercising weights or bar bells to employ a number of individual masses of various weights removably secured to the extremities of a bar. By this means a bar bell of predetermined weight may be had for exercising and the weight of the bar may be increased in discrete amounts as a person becomes more proficient.

While this method of constructing a bar bell is in common use it suffers from a number of disadvantages. Among such disadvantages is the difficulty of storage and handling of the masses while the bar bell is not in actual use. It will be appreciated that since the combined weight of all the masses is usually more than the athlete can lift, then considerable effort is required to assemble and store away the masses after each work-out even when done individually.

A second disadvantage is found in the fact that the purchase price of prior type bar bells is kept disproportionately high in contrast with the cost due to the shipping charges involved in distributing this considerable weight. The high cost of shipping also prevents long distance shipping which usually results in local manufacture of small lots and this in turn further increases the purchase price.

Accordingly, it is an object of the present invention to provide a bar bell of the character described having means of simply and continuously varying the weight thereof.

It is a further object of this invention to provide a bar bell using water as the main portion of the weight whereupon after exercising a person may discard the water thus leaving a lightweight bar bell which may be easily handled and stored.

It is a further object of this invention to provide a bar bell wherein the masses have a fixed centre of gravity for any given weight.

It is a still further object of this invention to provide a bar bell which may be disassembled for ease of transport and storage.

It is a further object of this invention to provide a bar bell which, while incorporating the foregoing objects may be manufactured at a comparatively low cost and shipped at a proportional charge.

These and other objects and features of the present invention will become apparent from the following detailed description and accompanying drawings of a presently preferred embodiment in which like numerals refer to like parts.

In the drawings:

FIG. 1 is a perspective view of an embodiment according to the present invention and illustrates the bar bell assembled and ready for use;

FIG. 2 is an enlarged view of one water chamber as seen from the inside face; and

FIG. 3 is a section along the line 3—3 in FIG. 2.

Referring now to FIG. 1 a bar bell indicated as **11** comprises a centre bar **12** having removably secured to the ends thereof end bars **13** and **14** which support water chambers **15** and **16** respectively. End bars **13** and **14** are prevented from inadvertent removal from centre bar **12** by means of clips **17** and **18**, details of which may be seen in FIG. 3 and will be later described.

Water chamber **16** is similar in all respects to water chamber **15** and for this reason only one will be herein described and toward this end reference will now be had to FIG. 2 and FIG. 3.

As will be seen from the drawing, chamber **15** comprises outer half **19** and inner half **20** joined peripherally at rim **21**. In this preferred embodiment half **19** is formed in a series of concentric steps or in the shape of a beehive, the reason for this being to increase the rigidity of this structure.

A pair of clamping plates **22** and **23** are secured centrally and to either face of half **19** by means of rivets **24**, plates **22** and **23** thus serving as a reinforced point of attachment as well as providing a watertight seal. A plug **25** secured within the outer end of bar **13** has a threaded stud **26** protruding therefrom. Stud **26** protrudes through a centrally located hole in plates **22** and **23** and in half **19** and a wing nut **27** is used to draw bar **13** tightly up against seal **28** whereby a removable water tight attachment is provided between half **19** and bar **13**.

With particular reference to FIG. 2 it will be noted that half **20** has a plurality of spirally placed pleats **29** formed in the material, pleats **29** starting at a position near the hub indicated as **30** and extending substantially to rim **21** of half **20**.

Hub **30** comprises inner plate **31** and outer flange **32** compressing therebetween half **20** by means of rivets **33**. Centrally located holes in plate **31** and flange **32** provided a freely sliding fit about bar **13**, whereas a centrally located hole in half **20** is greater than the diameter of bar **13**. A compressible seal **34** is positioned in the space provided by this hole in half **20** and provides a moving seal along the length of bar **13**.

A thumbscrew **35** is threadably inserted in flange **32** and is thus adapted to bear on bar **13** and position hub **30** thereupon.

It is preferable to form a lip **36** on half **19** at rim **21** to further increase the stiffness and at the same time provide a buffer against shock loads and abrasion. In this way the water containing portion of chamber **15** is protected against direct contact with the floor or other surface upon bar bell **11** being dropped in the normal course of exercising.

A pair of plugs **37** are removably inserted within a pair of diametrically opposed holes located in the peripheral portion of half **19** and provide means of filling and draining chamber **15** with water or other fluid **38**.

Bar **13** is provided with knurling **39** in order to prevent an athlete's hand from slipping as well as to indicate the preferred spacing of the grip. A scale **40** is also imprinted upon bar **13** which by registration of flange **32** therewith provides direct reading of the weight of chamber **15** for any particular setting.

Bar **13** is a sliding fit within a hole in bar **12** and a pin **41** on clip **17** is removably inserted within radially aligned holes in bars **12** and **13** and when inserted prevents rotation or removal of bar **13** relative to bar **12**.

In order to use bar bell **11** it would be first necessary to assemble the various portions and to fill chambers **15** and **16** with water. A preferred method of accomplishing this is to first position hub **30** at any predetermined position along the length of bar **13**, this position being indicated by scale **40**, the reading being the selected weight.

During movement of hub **30** half **20** deforms continuously at the periphery, the remainder of half **20** maintaining a generally conical configuration. It is a requirement of chamber **15** that the configuration remain substantially static for any particular setting during handling. This is necessary since the centre of gravity of the water mass must be fixed on the centre line of bar **13**.

It will be seen that any tendency of chamber **15** to sag will result in a downward displacement of the centre of gravity with a consequent unbalance about the rotational axis. This unbalance could result in a dangerous uncontrollable twisting force particularly when an athlete is lifting near his limit.

Whereas stiffness and rigidity of stationary half **19** is reasonably built in the problem of providing a sag proof half **20** is quite different. It has been found that by providing the configuration for half **20** as has been herein described and shown, that half **20** may be made from a flexible, substantially non-resilient material. Thus pleats **29** permit flexing of the material in two directions simultaneously, that is both radially and tangentially at the periphery of half **20** upon movement of hub **30**.

It is to be noted that for any position of hub **30** and thus for any volume of chamber **15** that water **38** completely fills chamber **15** and thus sloshing of water **38** with attendant uncontrollable acceleration forces is prevented. It is also to be noted that the volume of chamber **15** and thus the weight is continuously adjustable between the upper and lower limits of the chamber volume.

Upon the position of hub **30** being reached thumbscrew **35** is tightened and upper plug **37** is removed. Water **38** may then be poured into chamber **15** by means of a tube or other container until chamber **15** is completely filled whereupon plug **37** is reinserted.

This procedure is repeated for both chambers **15** and **16** after which they may be assembled to centre bar **12** by means of clips **17**. At this point bar bell **11** is ready for use in the normal manner. After use chambers **15** and **16** may be removed from bar **12** and lower plug **37** and upper plug **37** can be removed in order that water **38** may be drained.

It is worthwhile to note that bar **13** may be removed from chamber **15** by removing nut **27** and withdrawing bar **13**. Half **20** may then be collapsed into half **19** and the two chambers **15** and **16** be nested for transport and storage. It is also worthwhile to note that bars **12**, **13** and **14** comprise three substantially equal length bars the individual length of which is similar to the circumscribed

square of the diameter of chambers **15** and **16** making the packaging of bar bell **11** comparatively inexpensive.

It will be understood from the foregoing that the present invention comprises at least one chamber of variable volume having lifting means, said chamber being substantially non-deformable during use thereof, and said chamber being substantially full of fluid during said use.

It will be further understood that while a presently preferred embodiment of the instant invention has herein been disclosed, certain alterations in design and form may be resorted to, without departing from the spirit of the invention, and while still falling within the scope of the appended claims.

The embodiments of this invention in which an exclusive property or privilege is claimed are defined as follows:

1. A bar bell comprising an elongated bar, a variable volume fluid chamber at each end of the bar, the bar extending centrally through each fluid chamber, each fluid chamber having a first fixed portion and a second collapsible, movable portion that is continuously movable along the bar from a minimum volume position to a maximum volume position and vice versa, and the bar having readily visible exposed indicia means registering with a point on said second movable portion of each fluid chamber to indicate the volume of the fluid chamber at any position of the second movable portion and hence to indicate the weight of fluid within the fluid chamber.

2. A bar bell as claimed in claim **1** wherein each fluid chamber has a fluid inlet and a fluid outlet.

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