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[54] **FRICTION TYPE EXERCISING DEVICE**

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[52] **U.S. Cl.**..... **272/79 D**, 272/DIG. 3, 272/DIG. 4, 272/83 A

[51] **Int. Cl.**..... **A63b 21/00**

[58] **Field of Search**. 272/79 D, 79 R, 79 B, DIG. 3, 272/70.1, 83 A

[56] **References Cited**

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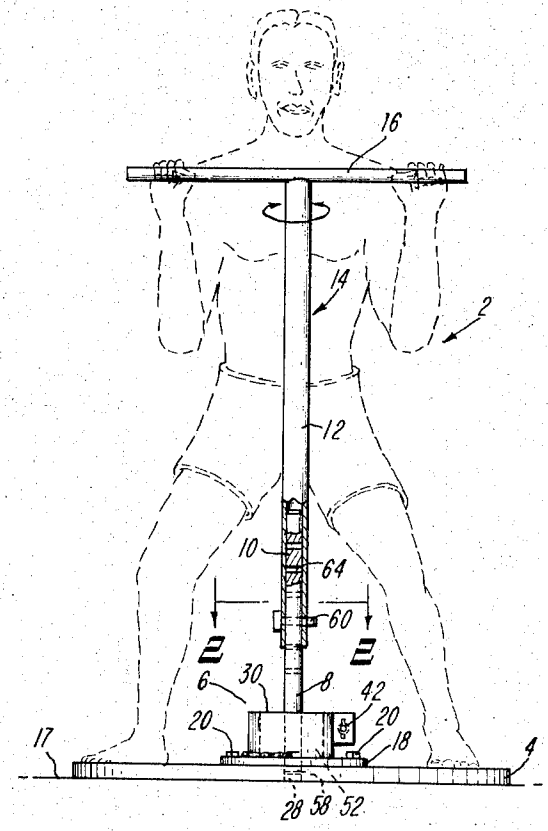
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Assistant Examiner—William R. Browne
Attorney, Agent, or Firm—Bacon & Thomas

[57] **ABSTRACT**

A platform has a vertically mounted, adjustable rotary resistance unit thereon, to which the lower end of the center leg of a vertically disposed T-shaped handle is connected. A subject standing on the platform grips the cross bar of the handle, and rotates the handle back and forth against the force of the resistance unit, thereby exercising selected body muscles. A torque frictional resistance is developed by the resistance unit against the twisting of the center leg by a user acting on the cross bar. The resistance unit has an adjustable clamp that grips a rotor on the lower end of the center leg to vary the frictional resistance to the rotation of the rotor. An anchored vertical bar may be used to lockingly engage the lower most portion of the T-shaped handle so as to offer resistance to twisting of the T-shaped handle. An adjustable collar may be provided on the vertical bar to vary the amount of torque necessary to twist the vertical bar.

11 Claims, 8 Drawing Figures



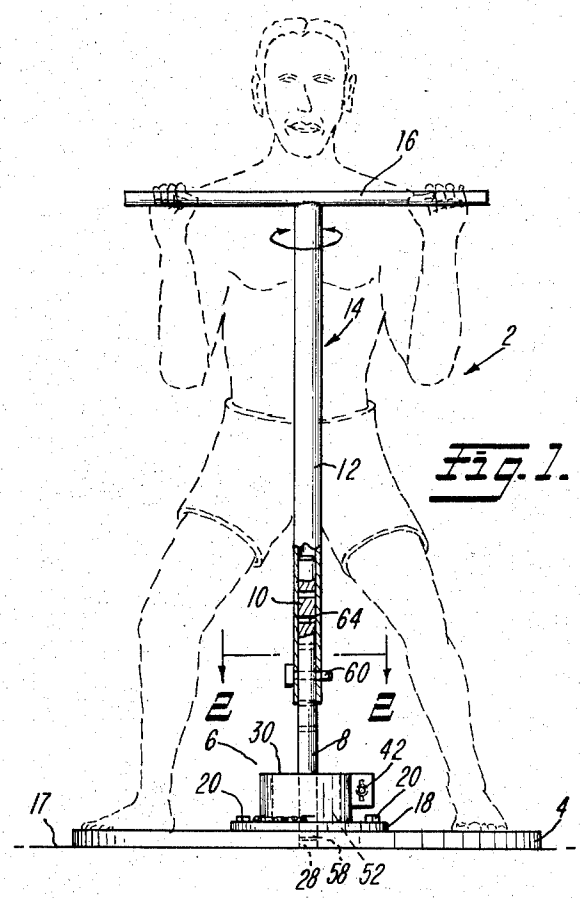


Fig. 1.

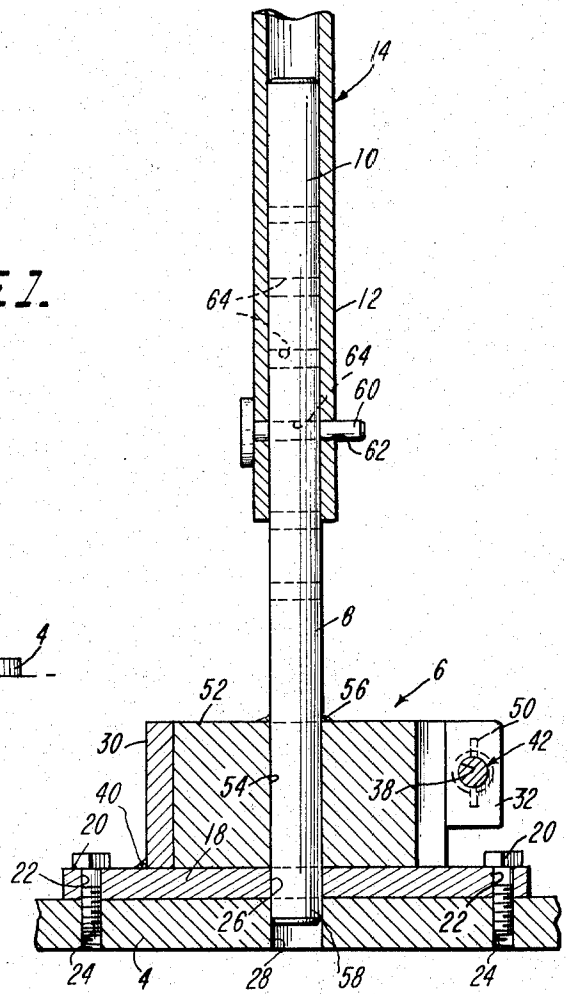


Fig. 3.

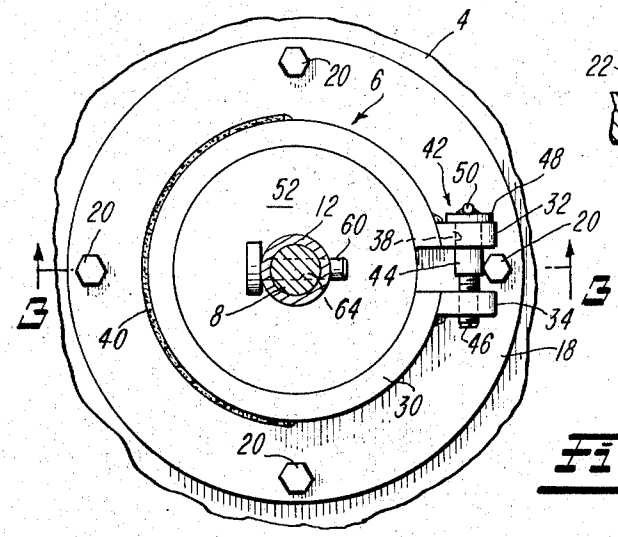


Fig. 2.

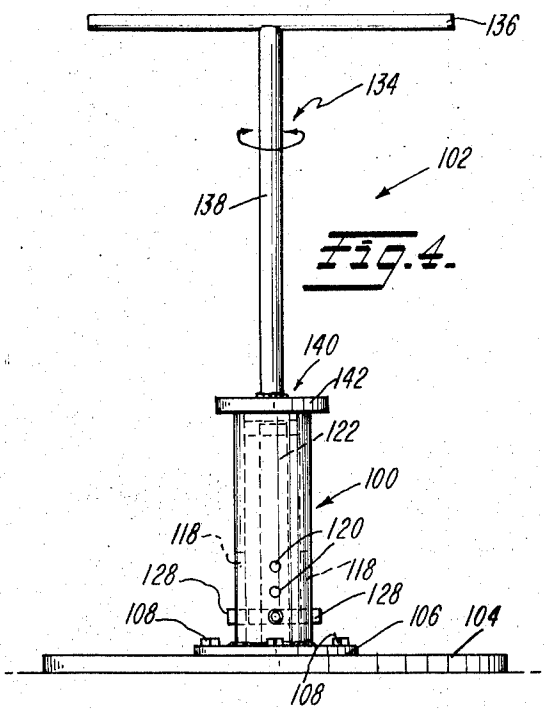


Fig. 4.

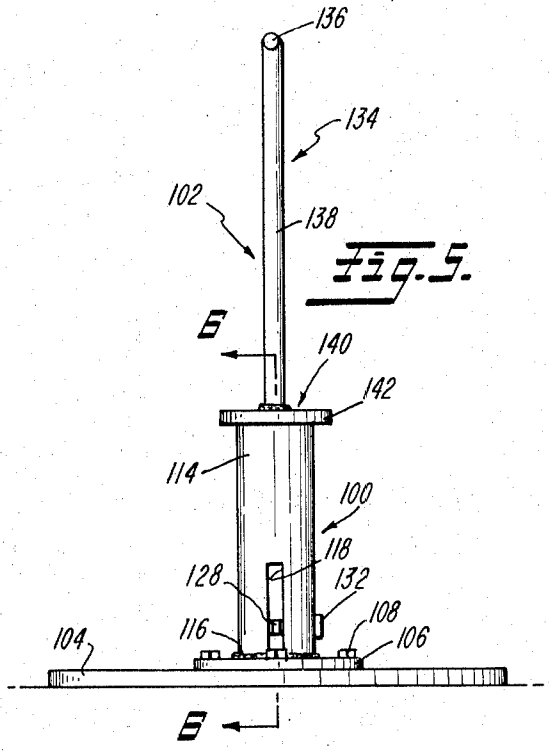


Fig. 5.

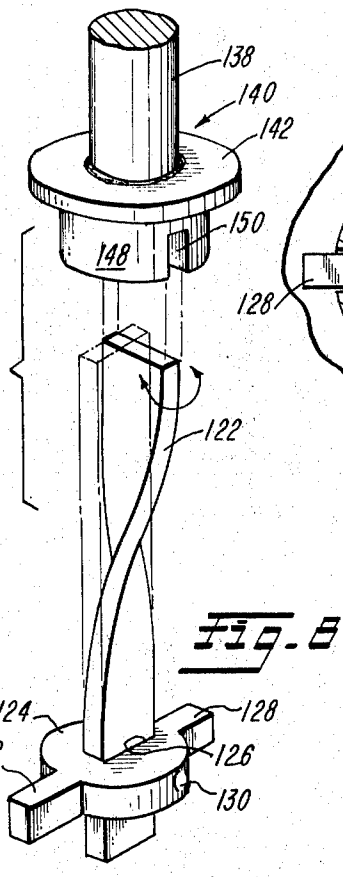


Fig. 8

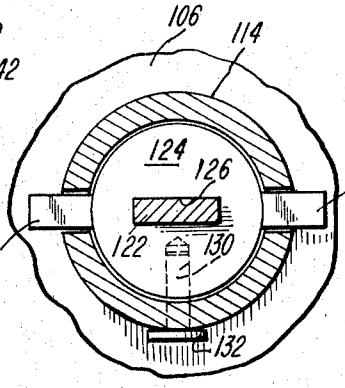


Fig. 7.

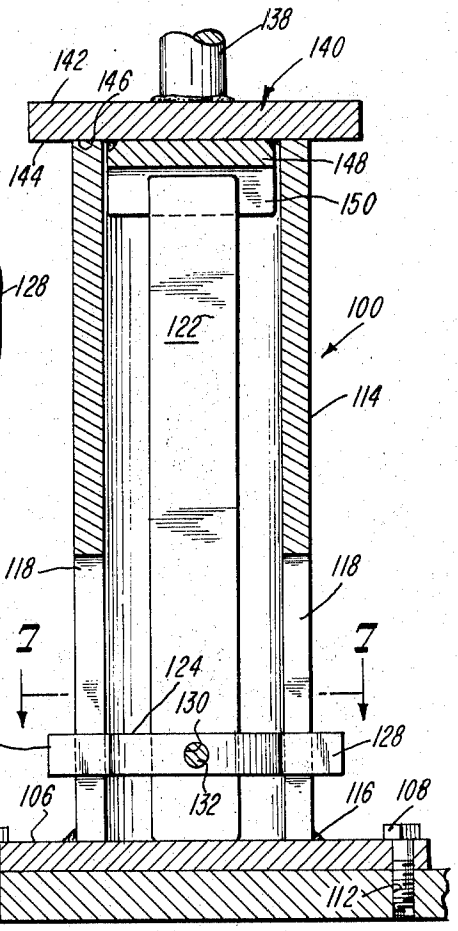


Fig. 6.

FRICTION TYPE EXERCISING DEVICE

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates generally to devices for exercising muscles of the human body, and more specifically to a unique adjustable rotary motion exerciser device adapted to work those muscle groups utilized to twist or turn the body.

2. Description of the Prior Art

There have been devices designed for use by athletes, businessmen and others who feel the need to exercise body muscles. Such exercises may be undertaken for the purpose simply of keeping in good physical condition, or they may be specifically designed for conditioning certain muscles so that the subject can be more profficient in certain athletic activities, like golf. The subject may want to do such muscle exercises at home, in a gymnasium, or at the office, and thus the device employed should be readily adaptable to any location.

The present invention is specifically intended for use in exercising those muscles used in twisting or turning the body. While devices have been produced for this general purpose, generally they suffer from one or more deficiencies that do not make them acceptable for use substantially anywhere by the average person. For example, some such devices are designed so that the subject must assume an unnatural position when using them, which limits their effectiveness and can even cause physical injury.

In other available devices permanent installation is required, a feature unacceptable in many homes and offices, and the devices are either unadjustable, or can be adjusted only by a fairly complicated arrangement. In addition, some presently available devices are ungainly in appearance, and are relatively expensive to purchase.

There is thus need for a rotary motion exercise device that is easily adjustable and economical, neat in appearance, and which can be easily used wherever desired. The present invention is intended to satisfy that need.

SUMMARY OF THE INVENTION

The present rotary motion exerciser includes a plate-like platform on which the subject stands, and which can be placed to rest on a carpeted floor in the office or home, on a gymnasium floor, on an outdoor surface, or wherever it is desired to use the device. A resistance unit is mounted vertically on the platform, and the lower end of the center leg of a T-shaped handle is connected thereto. The upper end of the handle has a horizontal cross bar, which the subject grasps when using the exerciser device.

In use, the subject stands on the platform with his feet spread apart and placed on opposite sides of the resistance unit. The opposite ends of the handlebar are then grasped, and the subject then twists or turns his body to thereby impart rotary motion to the handle. The resistance unit generates force opposing back and forth rotary motion of the handle, whereby the muscles used when twisting or turning the body are exercised. The exerciser is self-contained and need not be secured to the floor by nails or screws, the weight of the user holding it in place.

The resistance unit can be of different constructions, and is designed to provide an adjustable resistance torque. Two different embodiments of the resistance unit are disclosed herein, one employing friction to generate the resistance torque, and the other utilizing a torsion bar; both embodiments are designed to be easily adjustable.

The friction resistance unit includes a split cylinder having a portion of its circumference welded to a mounting pad that is in turn secured to the platform, the ends of the split cylinder having confronting flanges thereon with aligned bores, one of the bores being threaded. An adjustment screw extends through the other flange bore, and is threaded into the threaded bore in the first flange.

A rotor is received in the split cylinder, and carries an axial shaft to which the T-shaped handle is connected, the handle being adjustable vertically. Resistance torque is generated by friction resistance between the split cylinder and the rotor occurring when the latter is rotated by the handle, the value of such resistance torque being easily adjusted merely by turning the adjustment screw.

The torsion bar resistance unit includes a vertically disposed cylindrical housing secured at its lower end to a mounting plate, which plate is in turn secured to the platform. The housing has diametrically opposed vertical slots therein, and receives a rectangular torsion bar having a retainer collar slidably received on the lower portion thereof, the collar having diametrically opposed lugs thereon that are slidably received in the opposed vertical slots of the housing.

The lower end of the center leg of the T-shaped handle in this embodiment of the invention carries a retainer head having a transverse channel slot therein for receiving the upper end of the torsion bar. Thus, when the handle is rotated the torsion bar is twisted over the length thereof located between the retainer head and the position of the retainer collar, thereby generating resistance torque.

The value of the resistance torque generated by the torsion bar resistance unit is determined by the vertical position of the retainer collar. When the collar is at the extreme lower end of the torsion bar, the effective length of the bar is at its greatest value and resistance torque will be at a minimum. Sliding the collar upwardly on its torsion bar reduces the bar's effective length, and causes a greater resistance torque to be generated. The retainer collar is secured in any selected one of several possible vertical positions by a retainer pin, received through a selected one of several vertically spaced and aligned bores in the cylindrical housing.

With either resistance unit it is thus possible to readily adjust the resistance torque. Further, the exerciser device of either embodiment is neat in appearance and can be easily moved from one location to another, and is economical to construct.

It is a principal object of the present invention to provide a safe, effective device to exercise particular muscle groups of the human body, especially the muscles which allow the body to twist or turn.

Another object is to provide an exerciser device for use in exercising and reducing the mid-section in particular, and for generally promoting physical fitness of the user.

A further object is to provide a rotary motion exerciser wherein the subject can exercise against resistance torque generated mechanically either by friction or a torsion bar.

Yet another object is to provide a rotary motion exerciser device which is adjustable in height to fit various persons, and which has an adjustable resistance unit whereby the user can adjust the degree of resistance torque to suit his own needs.

Still another object is to provide an exercise device which can be used indoors and without damage to floors or floor coverings, and which is portable.

Other objects and many of the attendant advantages of the present invention will become readily apparent from the following Description of the Preferred Embodiments, when taken together with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a front elevational view, partly broken away, of a first embodiment of the present invention wherein the rotary resistance unit is of the friction type, a subject being shown by broken lines on the exerciser device to illustrate how such is used;

FIG. **2** is an enlarged, fragmentary view taken along the line **2—2** of FIG. **1**, and showing the friction resistance unit in top plan view;

FIG. **3** is a fragmentary, vertical sectional view taken along the line **3—3** of FIG. **2**, showing further details of the friction resistance unit, and the adjustable in height exerciser handle;

FIG. **4** is a front elevational view of a second embodiment of the rotary exerciser device of the invention, utilizing a torsion bar resistance unit;

FIG. **5** is a side elevational view of the device of FIG. **4**, showing in particular the vertical adjustment slots in the cylindrical housing on the resistance unit;

FIG. **6** is an enlarged, fragmentary vertical sectional view taken on the line **6—6** of FIG. **5**, showing the interior of the resistance unit;

FIG. **7** is a fragmentary sectional view taken on the line **7—7** of FIG. **6**, showing in particular the retainer collar and how such is arranged; and

FIG. **8** is an exploded perspective view of the torsion bar, the retainer collar and the lower end of the handle, showing how the torsion bar is operated to produce resistance torque.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to FIGS. **1–3** of the drawings, a first embodiment of the present rotary exerciser device is indicated generally at **2**, and includes a plate-like platform **4** having a vertically oriented friction resistance unit **6** mounted centrally thereon, said unit including a shaft **8** to the upper end **10** of which the center leg **12** of a T-shaped handle **14** is connected, the handle **14** having a horizontal cross bar **16** at its upper end. The dimensions and configuration of the platform **4** can be varied, but such is to be sufficiently large so that the feet of a subject using the exerciser device **2** can be comfortably accommodated thereon, the weight of the subject being sufficient to hold the device **2** in position on a floor **17** or other supporting surface without the use of screws, nails, stakes or the like.

The friction resistance unit **6** includes a mounting pad **18** secured centrally to the upper surface of the platform **2** by screws or bolts **20**, the bolts **20** passing through bores **22** in the pad **18** and being threaded into threaded bores **24** provided in the platform **2**. The mounting pad **18** has a circular hole **26** centrally thereof, which is in alignment with a hole **28** of like diameter in the platform **2**. The lower end of an upright split cylinder **30** rests on the mounting pad **18** concentrically of the aligned holes **26** and **28**.

The split cylinder **30** has two parallel, outwardly projecting flanges **32** and **34** welded to the opposite edges thereof, the flanges extending from the top edge of the cylinder downwardly for about three-fourths the height thereof. The flange **34** has a threaded bore **36** therethrough that is aligned with a larger, unthreaded bore **38** in the flange **32**. The bottom edge of the cylinder **30** opposite the flanges **32** and **34** is secured to the mounting pad **18** by a weld **40**, the center of the weld **40** being disposed diametrically opposite the space between the confronting flanges **32** and **34**, and the arc length of said weld being about 180°.

An adjustment screw **42** is provided for connecting the flanges **32** and **34**, and includes a body portion **44** receivable through the enlarged bore **38**, and from which extends a reduced diameter threaded portion **46** that is engageable in the threaded bore **36**. The outer end of the body portion **44** has an enlarged head **48** thereon, to which a crosspin **50** is welded to aid in turning the screw. When the adjustment screw **42** is tightened the portions of the split cylinder **30** outside the weld **40** are moved radially inwardly, and the inherent resiliency of said cylinder will effect movement in the opposite direction when said screw is subsequently loosened.

Received within the split cylinder **30** of the resistance unit **6** is a cylindrical rotor **52** having an axial bore **54** therethrough within which is received the shaft **8**, said shaft being secured to the rotor by a weld **56** or other suitable means. The lower end **58** of the shaft **8** projects beyond the rotor **52** and is journaled within the aligned circular openings **26** and **28**, whereby the rotor **52** is fixed against radial movements. The rotor **52** fits snugly within the cylinder **30** so that a friction resistance will be created therebetween when the rotor is turned by the shaft **8**, whereby a resistance torque is placed on said shaft. The value of the resistance torque is easily adjusted by turning the adjustment screw **42** in the proper direction.

The center leg **12** of the handle **14** is hollow, and the upper end thereof is welded centrally to the cross bar **16**. The upper end **10** of the shaft **8** is telescopically receivable within the lower end of the center leg **12**, to which it is secured by a pin **60** passed through a diametric bore **62** in the leg **12** and a selected one of several vertically spaced diametric bores **64** in the shaft upper end **10**. The height of the cross bar **16**, as is easily seen, can be varied by inserting the pin **60** into an appropriate bore **64**.

With the height of the cross bar **16** properly adjusted and the adjustment screw **42** turned to produce the desired degree of friction between the rotor **52** and the split cylinder **30**, the subject stands on the platform **2** as shown in FIG. **1**, with feet spread apart and with the hands grasping the opposite ends of the cross bar **16**. The subject then twists the upper portion of his torso back and forth, thereby rotating the shaft **8** and the rotor **52**. As the rotor is moved, friction between it and the inner surface of the cylinder **30** creates a resistance

force that is applied over the radius of the rotor to place a resistance torque on the shaft **8**, thereby creating a force against which the body muscles must work. It is readily seen that the result of effort by the user is to exercise the specific body muscles used to twist or rotate the torso.

The friction resistance unit **6** is simple and economical to construct, maintenance free, and easily adjusted. However, it is to be understood that other types of resistance units capable of producing adjustable resistance torque might be used instead of the unit **6**, for example the torsion bar resistance unit indicated at **100** in FIGS. **4–6**, used in connection with a second embodiment **102** of the present rotary exerciser device.

Referring now to the embodiment of FIGS. **4–6**, a platform **104** is shown therein that is similar to the platform **4** of the exerciser **2**, except that such need not have a bearing opening centrally therein. The torsion bar resistance unit **100** is disposed centrally on the platform **104** in a vertical position, and includes a mounting pad **106** secured to the platform by bolts **108**, the bolts **108** passing through bores **110** in the pad **106** and being threaded into bores **112** in the platform.

Disposed centrally on the mounting pad **106** is a vertically disposed cylindrical housing **114**, the lower end of said housing being secured to the pad **106** by a circumferential weld **116**. The housing **114** has two vertical, diametrically opposed slots **118** cut therein, extending from the lower end thereof to about one-half the height of the housing. Displaced 90° from the slots **118** is a vertical row of spaced bores **120**, the purpose for which will be explained later.

Received within the cylindrical housing **114** is a rectangular torsion bar **122**, which can be made of spring steel having torsion characteristics suitable for the exerciser device **102**. Slidably received on the bar **122** is a circular retainer collar **124**, the collar having an external diameter slightly less than the internal diameter of the housing **114**, and having a central rectangular opening **126** therein for snugly receiving the bar **122** with a sliding fit. The retainer collar **124** has diametrically opposed rectangular lugs **128** thereon that slidingly fit within the diametrically opposed slots **118**, and displaced 90° therefrom the collar has a radial bore **130** that is alignable with the bores **120** in the housing **114**.

The retainer collar **124** is assembled into the slots **118** before the lower end of the housing **114** is welded to the mounting pad **106**. It functions to securely hold the lower end portion of the torsion bar **122** while the upper end thereof is being twisted, the cooperating lugs **128** and slots **118** holding the bar's lower end against twisting movement, and the circular body of the collar **124** keeping the lower end of the bar centrally positioned in the housing **114**. The collar **124** is held in a selected vertical position by a pin **132** passed through a selected one of the bores **120**, and seated in the bore **130**.

The exerciser device **102** includes a T-shaped handle **134**, having a horizontal cross bar **136** to which is centrally welded the upper end of a vertical center leg **138**. Welded to the lower end of the handle center leg **138** is a retainer head **140**. While the handle **134** is thus not shown to be vertically adjustable in height, it is to be understood that the center leg **138** thereof might be constructed of telescoping members to be adjustable in length, if such is desired, in a manner similar to the arrangement shown for the handle **14**.

The retainer head **140** includes a circular bearing plate **142** of larger diameter than the external diameter of the housing **114**, and which includes a flat lower surface **144** adapted to rest upon the flat upper end face **146** of the housing. Welded centrally to the lower face **144** of the bearing plate **142** is a circular anchor block **148** having an external diameter slightly less than the internal diameter of the housing **114**, and having a deep, diametric slot **150** therein with parallel sidewalls spaced apart a distance just slightly greater than the thickness of the upper end of the torsion bar **122**. The lower end of the torsion bar **122** rests on the mounting pad **106**, and the bar is of such length that the upper end thereof is well seated in the diametric slot **150**. It is to be understood that the retainer head **140** might be made in one piece, if desired.

With the retainer head **140** seated on the housing **114** and engaged with the torsion bar **122**, the device **102** is ready for use. The subject stands on the platform **104** and grasps the oppsoite ends of the cross bar **136**, just as in FIG. **1**, and then twists his body to effect rotation of the handle **138**. When such rotation occurs the torsion bar **122** is twisted over the length thereof between the anchor block **148** and the retainer collar **124**, thereby generating resistance torque against which the body muscles can work.

The value of such resistance torque is directly related to the effective length of the torsion bar **122**, the effective length being that portion of the bar between the anchor block **148** and the retainer collar **124**, This effective length can be varied by adjusting the height of the retainer collar **124**, which is easily done by merely pulling the pin **132**, sliding the collar to the next desired bore **120**, and then reinserting the pin. When a greater resistance torque is wanted the collar **124** is moved upwardly to shorten the effective length of the torsion bar **122**, and vice-versa.

It is readily seen that the exerciser device **102** of FIGS. **4–8** is rugged, economical to construct, and easily adjustable. Thus, both embodiments of the invention satisfy the objects hereinabove set forth. Obviously, variations of the invention are possible.

What I claim is:

1. A rotary motion exerciser device, comprising: a portable platform upon which a subject using the device stands; a vertically disposed resistance unit mounted centrally on said platform, and including a vertical shaft rotatable in either direction about the vertical axis thereof; a T-shaped handle, said handle including a straight, generally vertically disposed center leg aligned with the vertical axis of and connected at its lower end to said shaft of said resistance unit, and a generally horizontal straight cross bar attached to the upper end of said center leg; and means on said resistance unit for fixing said vertical shaft in a vertical orientation with respect to the platform so that said shaft cannot be moved out of said vertical orientation during the rotation of said shaft by said T-shaped handle by a person standing upon said platform and gripping and manipulating the opposite ends of said cross bar.

2. A rotary motion exerciser device as recited in claim **1**, wherein said center leg of said handle is adjustable in height above the platform.

3. A rotary motion exerciser device as recited in claim **1**, wherein said resistance unit is adjustable,

whereby the value of resistance torque generated against rotation of said handle can be adjusted.

4. A rotary motion exerciser device as recited in claim **3,** wherein said resistance unit includes a friction resistance.

5. A rotary motion exerciser device as recited in claim **4,** wherein said friction resistance comprises: a vertically disposed split cylinder, a portion of the circumference of the lower end of said split cylinder away from said split being secured to said platform; a rotor received within said split cylinder, said shaft connected to the lower end of said center leg of said handle being secured to said rotor; and adjustable means for tightening said split cylinder about said rotor, whereby the inner surface of said split cylinder grips the peripheral surface of said rotor with a selected degree of force.

6. A rotary motion exerciser device as recited in claim **5,** wherein said adjustable tightening means includes a pair of abutting flanges on said split cylinder, located on opposite sides of the split therein; and an adjustment screw engaged with said flanges.

7. A rotary motion exerciser device as recited in claim **5,** wherein said shaft extends through and projects downwardly from said rotor, and wherein said projecting lower shaft end is journaled in said platform to thereby limit lateral shifting of said rotor.

8. A rotory motion exerciser device as recited in claim **3,** wherein said resistance unit utilizes a torsion bar to generate torque resistance.

9. A rotary motion exerciser device as recited in claim **8,** wherein said shaft and said center leg of said T-shaped handle are integral, and wherein said resistance unit comprises: a vertical cylindrical housing secured at its lower end to said platform, and having at least one vertical slot therein; a retainer collar slidably received within said housing, said collar having a radial lug thereon slidably received in said vertical slot, and having a central opening therein; a torsion bar received within said housing and passing through said central opening in said collar, said torsion bar having a non-circular cross section, and said central opening conforming to said cross section whereby to prevent relative rotation between said collar and said bar; means for selectively securing said retainer collar at different heights within said vertical housing; and a retainer head engaged with the upper end of said torsion bar, said retainer head being secured to the lower end of said shaft.

10. A rotary motion exerciser device as recited in claim **9,** wherein said means for selectively securing said retainer collar includes a pin, said collar having a radial bore therein to seat said pin, and said cylindricial housing having a plurality of vertically spaced bores therethrough to selectively receive said pin.

11. A rotary motion exerciser device as recited in claim **9,** wherein said retainer head comprises: a bearing plate adapted to engage the upper end face of said cylindrical housing; and an anchor block having slot means therein conforming to the cross sectional configuration of said torsion bar, and adapted to receive the upper end portion of said bar.

* * * * *