Aug. 20, 1968 J. K. BLASI 3,397,884

ISOMETRIC EXERCISING AND STRENGTH-TESTING DEVICE

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FIG. 1.

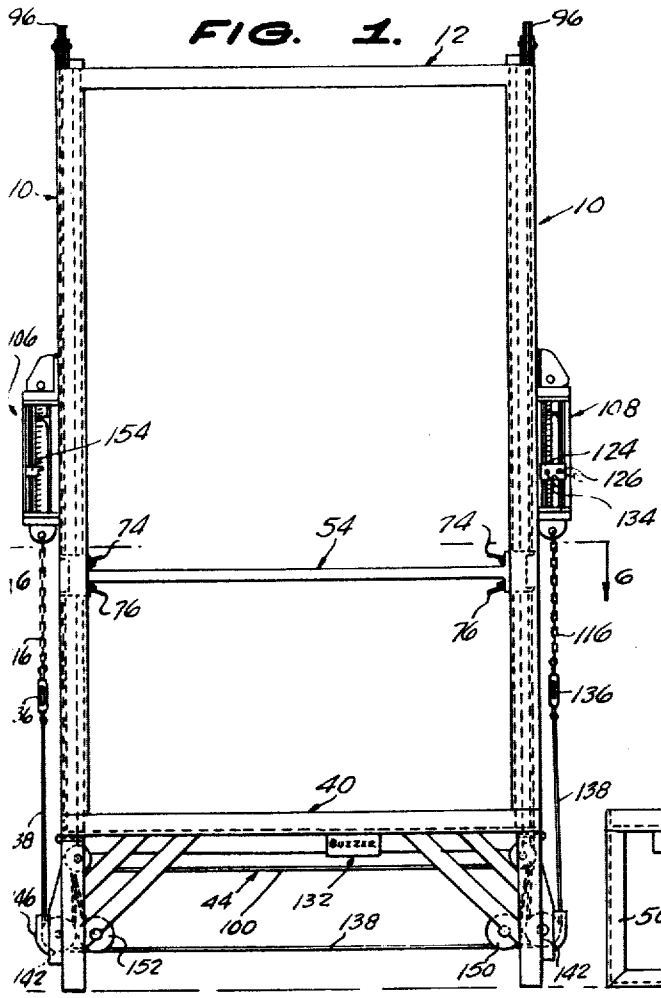



FIG. 2.

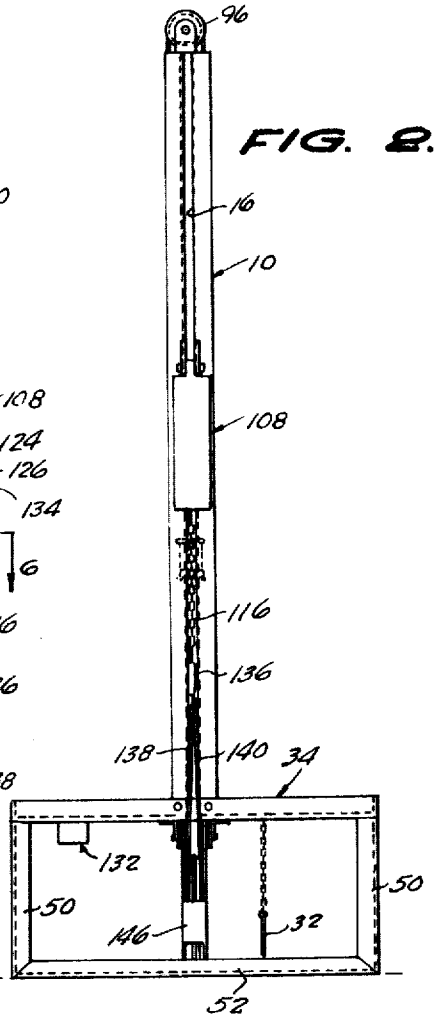
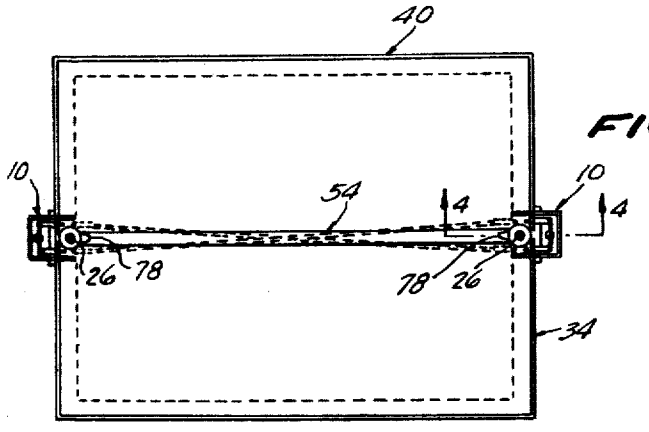



FIG. 3.




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FIG. 4.

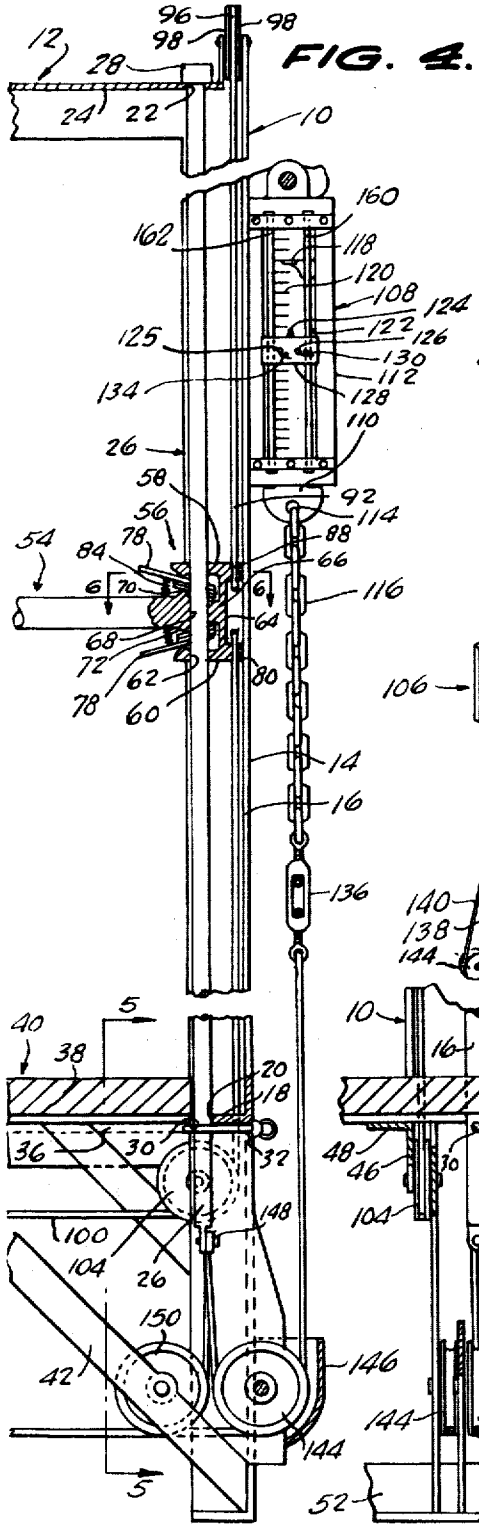



FIG. 7.

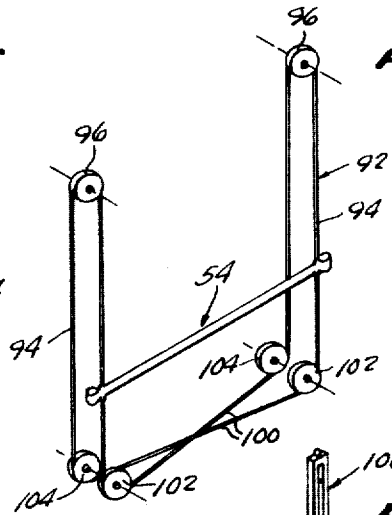



FIG. 8.

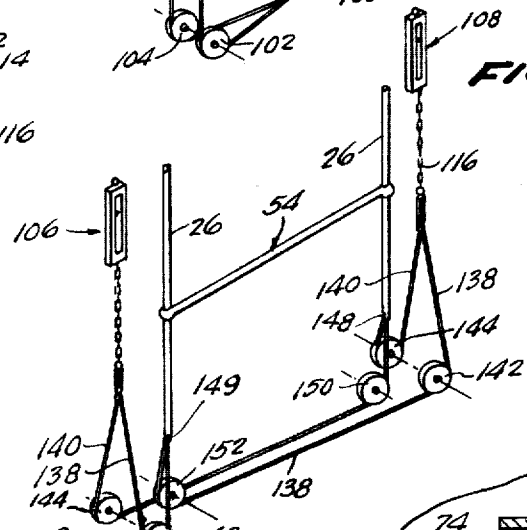



FIG. 5.

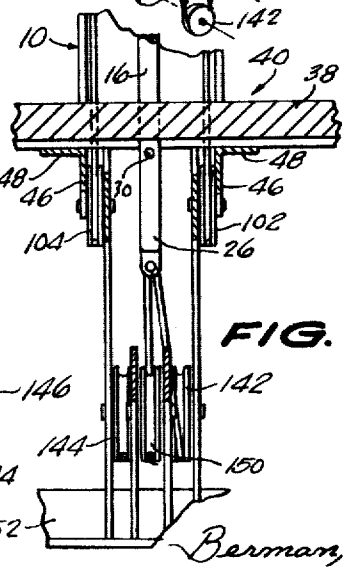
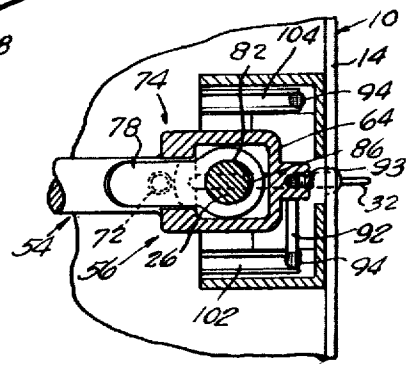



FIG. 6.




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# ISOMETRIC EXERCISING AND STRENGTH-TESTING DEVICE

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10 Claims. (Cl. 272—83)

## ABSTRACT OF THE DISCLOSURE

A device for performing isometric exercises and testing the increased strength of the exerciser. A pair of vertical rods adjustably mounts a horizontal cross-bar at its ends, above a stationary platform. The exerciser stands on the platform and grasps the bar for performing isometric exercises. The rods are normally immobile on a support frame, but the removal of anchoring pins connecting the rods to the frame enables them to be lifted upwardly upon upward movement of the cross-bar. The lower ends of the rods are connected by a cable system to spring scales mounted on the frame, which are used to measure the amount of force or pull exerted by the exerciser in lifting the rods, against the tension of the springs in the scales. A second cable system is also provided for insuring that the cross-bar remains horizontal and does not tilt.

This invention relates to a combination isometric exercising and strength measuring device.

In conducting personal and class isometric exercise courses, it is of interest and importance to the success thereof that the participant or participants have available not only efficient and practical means for carrying out such exercises, but also means of ascertaining the gains of strength resulting therefrom. Heretofore, these means have been in the form of separate and distinct devices, the provision of which involves substantial expense and involves dual problems of storage and maintenance.

The primary object of the invention is the provision of a unitary combination exercise and test device, adapted to be used for both isometric exercising and strength measuring, which provides these dual facilities and which eliminates or reduces the expense and trouble of two separate devices.

Another object of the invention is the provision of a combination device of the character indicated above, which incorporates means for visually indicating, in suitable scale units, amounts of strength imposed on the device, while exercising, and means for audibly indicating, while exercising, exertion of strength on the device which surpasses a previously established standard.

In the drawings:

FIGURE 1 is a front elevation of a device of the invention;

FIGURE 2 is a side elevation of said device;

FIGURE 3 is a horizontal section, taken on the line 3—3 of FIGURE 1;

FIGURE 4 is an enlarged fragmentary vertical section, taken on the line 4—4 of FIGURE 3;

FIGURE 5 is a fragmentary vertical section taken on the line 5—5 of FIGURE 4;

FIGURE 6 is an enlarged fragmentary section taken on the line 6—6 of FIGURE 4;

FIGURE 7 is a schematic view of the upper, bar-levelling cable system; and

FIGURE 8 is a schematic view of the lower, strength-measuring cable system.

Referring in detail to the drawings, the illustrated device comprises a vertical open frame F, having parallel perpendicular uprights or side members **10**, preferably of facing channel form, which are spaced and fixedly connected, at their upper ends, by an upper cross member **12**, preferably of downwardly facing channel form. The side members **10** have webs **14**, which are formed with vertical closed slots **16**, which are closed, at their lower ends, by inwardly extending horizontal flanges **18**.



The horizontal flanges **18** are formed, at their inner edges, with openings **20**, which are vertically aligned with openings **22**, provided in the web **24** of the upper cross member **12**, through which slide cylindrical rods **26**. The rods **26** have enlarged diameter heads **28**, on their upper ends, adapted in their depressed positions, to have stop engagements with the web **24** of the upper cross member **12**. The rods **26** are formed with horizontal diametrical bores **30**, adjacent to their lower ends, through which anchor pins **32** are adapted to be engaged, through the side member slots **16**, to bear against the undersides of the horizontal flanges **18**, to keep the rods **26** down in their depressed positions, as shown in FIGURE 4.

A rectangular open horizontal angle iron frame **34**, extends between the uprights **10**, with the horizontal flanges **36** thereof on a level with the horizontal flanges **18** of the uprights **10**, which are components of the horizontal flanges of the frame **34**. The frame **34** extends equally behind and in front of the uprights **10**, and a heavy plate **38** is seated thereon, to define a platform **40**, upon which the exerciser is adapted to stand while exercising with the device. The frame **34** is braced to the uprights **10**, as by means of diagonal braces **42** extending from the underside of the frame, to lower parts of the uprights. A lower rear angle iron cross member **44** extends between and is fixed to the uprights **10**, and is spaced slightly below the platform **40**, the member **44** having a vertical flange **46** and a horizontal flange **48**. Vertical corner members **50** extend downwardly from the frame **34** and are jointed to floor-engaging horizontal end members **52**.

For isometric exercising, while standing on the platform **40**, the exerciser grasps a horizontal bar **54**, which extends between the rods **26**. The exercise bar **54**, as shown in FIGURES 4 and 6, has fixed slides **56**, on its ends, which comprise parallel spaced upper and lower plates **58** and **60**, respectively, which are formed with openings **62**, passing the rods **26**, the plates **58** and **60** being joined, at their outer ends, by vertical plates **64**, spaced outwardly from the rods **26**. The exercise bar **54** has reduced end portions **66** which are fixed, at their outer ends, to the vertical plates **64**, and which are provided with openings **68**, slidably receiving the rods **26**. Between the reduced end portions **66** and the main portion of the exercise bar, upwardly and downwardly extending fulcrums **70** and **72**, are provided on the bar, which are located at the inner ends of the slide plates **58** and **60**, respectively.

Similar but reversed friction latches **74** and **76**, respectively, are provided for releasably locking the exercise bar **54**, in different vertically adjusted positions, on the rods **26**. Each of said latches comprises a flat arm **78** extending inwardly out of the related slide **56**, between the related plates **58**, **60** and the related fulcrums **70**, **72**. The arms **78** have, on their facing sides, at their outer ends, built-up portions **80**, the arms and these built-up portions being formed with openings **82** which receive the rods **26**. As shown in FIGURE 6, the openings **82** are larger in diameter than the rods **26**, only in the direction of the length of the exercise bar **54**, so that, when the arms **78** are compressed toward each other, against the resistance of springs **84** interposes between the arms **78**, and related sides of the bar **54**, and bear upon related fulcrums **70**, **72**, the edges **86** of the openings **82** are released from frictional holding engagements with the rods **26**, so that the exercise bar **54** can be raised or lowered relative to the rods **26**. Release of the arms **78** enables the springs **84** to restore the edges **86** of the openings

82 into frictional holding engagements with the rods 26.

The outer ends of the slide plates 58, 60 are formed with openings 88, through which are suitably secured, as indicated by set screw 93, the ends of an exercise bar levelling cable 92, which, as indicated in FIGURE 7, has flights 94 which are trained over upper pulleys 96, which, as shown in FIGURE 4, are journalled between upstanding ears 98, on the upper ends of the uprights 10, which extend above the upper cross member 12.

The cable flights 94 are enclosed within the uprights 10, and terminate, at their lower ends, in crossed horizontal flights 100, which are severally trained under, and extend between, pairs of front and rear lower pulleys 102, 104. The pulleys 102, 104 are journalled on the front and rear flanges, respectively, of the uprights 10, at locations immediately below the platform 40. As a result of this arrangement, the exercise bar 54 is prevented from being tilted out of horizontality, when the latches 74, 76 are released and the bar is vertically adjusted on the rods 26.

For the purposes of visible and audible indications of the strength of lift imposed, on the exercise bar 54, by an exerciser, spring-retracted, left and right hand scale assemblies 106, 108 are mounted externally on the webs of the uprights 10, at locations between the platform 40 and the upper ends of the uprights. The left hand scale assembly 106, like the right hand scale assembly 108, is provided with a spring retracted bar 110, working in a housing 112, to whose exposed lower end is secured, as indicated at 114, the upper end of a chain 116. The bars 110 are provided with lateral pointers 118, which refer to vertical scales 120, fixed within the housings 112, the pointers and the scales being visible through front openings 122 of the housings, whereby visual indications are obtainable as to the degree of strength of lift imposed on the exercise bar 54.

The right hand scale assembly 108, has, in addition to the above, an electrical contactor or switch 124, which is suitably electrically connected, through movement of the bar 110, and consequent contact and depression by pointer 118 to bridge a contact 126 and 125 carried by an insulated plate 128, secured to the housing across the front opening 122 thereof. A wire 130 leads from the contact 126 to one side of a circuit (not shown) leading to an audible buzzer 132, mounted to the underside of the platform 40, the other side of the circuit being connected to a wire 134 secured to contact 125.

Secured, by adjustable turnbuckles 136, to the lower ends of the chains 116, are the upper ends of front and rear lower cables 138 and 140, respectively, which, as shown in FIGURES 4, 5 and 8, are turned under and between lower front and rear pulleys 142 and 144, respectively, which are journalled on the uprights 10, below the upper pulleys. The pulleys 142, 144 are enclosed by protective hoods 146 fixed to the outer sides of the uprights 10.

One of the rear lower cables 140, after passing around a lower rear pulley 144, is secured, at its upper end, as indicated at 148, to the lower end of a related one of the rods 26. The other rear lower cable 140, after passing around the other related lower rear pulley 144, is brought across to and is trained under a lower intermediate pulley 150, spaced inwardly from the lower front and rear pulleys, and secured to the lower end of the aforementioned rod 26. A lower front cable 138, after passing under a related lower front pulley 142, is brought across and is trained under another intermediate pulley 152, and is connected to the lower end of the remaining rod 26, as indicated at 149. Similarly, the other related front cable 138, after passing around the other related lower front pulley 142, is connected to the remaining rod 26.

As a result of this arrangement, when pull is exerted upwardly on the exercise bar 54, and anchor pins 32 are removed, equal amplitudes of downward movement of



the chains 116, and hence, of the scale assembly bars 110 takes place, so that the pointers 118 make the same indications, relative to the scales 120, on the two scale assemblies 106, 108, so as to establish a standard or norm of strength of effort of the particular exerciser, at the time.

However, when it is desired to establish a greater standard or norm, a slider 154, mounted on the housing of the left hand scale assembly 106, is provided, which is adjustable downwardly below its first established norm, so as to give a visual indication of the strength of a greater succeeding effort, on the part of the exerciser. Similarly, the insulated contact plate 128 of the right hand assembly 108, is slidably mounted on vertical stationary bars 160 and 162 on the housing of the right hand scale assembly 108, so that the same can be adjusted below the first established norm. Should the exerciser exert sufficient extra pull-up on the exerciser bar 54, to make the contactor 124 reach and bridge contacts 125 and 126, the buzzer 132 will give audible indication of the fact.

What is claimed is:

1. A device of the character described comprising a support having parallel uprights and a fixed upper cross member extending therebetween, a fixed exerciser's platform extending between the uprights and spaced below said cross member, vertical rods disposed at the inner sides of the uprights and mounted on the support for vertical movements relative thereto between depressed and elevated positions, stop means on the upper ends of the rods engageable with said upper cross member only in the depressed positions of the rods, retaining means on the uprights releasably engageable with said rods only in the depressed positions thereof to retain said rods against upward movement, and a horizontal exercise bar extending between and connected to said rods.

2. A device according to claim 1, wherein said exerciser bar has slides on its ends slidably engaged with said rods, and latch means on the slides releasably engaged with the rods for locking the exercise bar in vertical positions of adjustment relative to the rods.

3. A device according to claim 1, wherein said exerciser bar has slides on its ends slidably engaged with said rods, latch means on the slides releasably engaged with the rods for locking the exercise bar in vertical positions of adjustment relative to the rods, and exercise bar leveling means operatively connected between the slides and said support.

4. A device according to claim 1, wherein said exerciser bar has slides on its ends slidably engaged with said rods, latch means on the slides releasably engaged with the rods for locking the exercise bar in vertical positions of adjustment relative to the rods, and exercise bar levelling means operatively connected between the slides and said support comprising a levelling cable system.

5. A device according to claim 1, wherein said exercise bar has slides on its ends slidably engaged with said rods, latch means on the slides releasably engaged with the rods for locking the exercise bar in vertical positions of adjustment relative to the rods, and exercise bar levelling means operatively connected between the slides and said support comprising a levelling cable system having upper pulleys on the upper ends of the uprights, pairs of front and rear pulleys located beneath the platform and adjacent to the uprights, and first cables trained over the upper pulleys having their ends secured to the slides, said cables having front and rear flights trained severally under the front and rear pulleys, said flights being trained between and crossed relative to the pairs of front and rear pulleys.

6. A device according to claim 1, wherein said uprights have scale assemblies fixed thereon, each of said scale assemblies comprising a fixed housing containing a fixed vertical scale and a vertical movable bar having a lateral pointer referred to in the scale, and means operatively connecting the exercise bar to the movable

bars of the scale assemblies, while said retaining means is disengaged from the rods.

7. A device according to claim 1, wherein said uprights have scale assemblies fixed thereon, each of said scale assemblies comprising a fixed housing containing a fixed vertical scale and a vertical movable bar having lateral pointer referred to in the scale, and means operatively connecting the exercise bar to the movable bars of the scale assemblies, while said retaining means is disengaged from the rods, one of said scale assemblies having a vertically adjustable member, referred to the scale thereof, and to the pointer of the related vertically movable bar.

8. A device according to claim 1, wherein said uprights have scale assemblies fixed thereon, each of said scale assemblies comprising a fixed housing containing a fixed vertical scale and a vertical movable bar having a lateral pointer referred to in the scale, and means operatively connecting the exercise bar to the movable bars of the scale assemblies, while said retaining means is disengaged from the rods, said connecting means comprising chains secured at their upper ends to the movable bars of the scale assemblies, pairs of front and rear cables secured at their upper ends to the lower ends of the chains, pairs of front and rear lower pulleys journalled on the support beneath the platform, intermediate lower pulleys journalled on the support inwardly of said pairs of pulleys, one of said front cables being trained under a front pulley and around a related intermediate pulley and connected to one of said related rods, the other one of said front cables being trained under the other of said front pulleys and connected to the same rod.

9. A device according to claim 1, wherein said uprights have scale assemblies fixed thereon, each of said scale assemblies comprising a fixed housing containing a fixed vertical scale and a vertical movable bar having a lateral pointer referred to in the scale, and means operatively connecting the exercise bar to the movable bars of the scale assemblies, while said retaining means is disengaged from the rods said connecting means comprising chains secured at their upper ends to the movable bars of the scale assemblies, pairs of front and rear cables secured at their upper ends to the lower ends of the chains, pairs of front and rear lower pulleys journalled on the support beneath the platform, intermediate lower pulleys journalled on the support inwardly of said pairs



of pulleys, one of said cables being trained under a front pulley and around a related intermediate pulley and connected to one of said related rods, the other one of said front cables being trained under the other one of said front pulleys and connected to the same rod, a rear cable being trained under a related rear pulley and connected to another of said rods, the other of said rear cables being trained under a related rear pulley and under a related intermediate pulley and connected to the other of said related rods.

10. A device according to claim 1, wherein said uprights have scale assemblies fixed thereon, each of said scale assemblies comprising a fixed housing containing a fixed vertical scale and a vertical movable bar having a lateral pointer referred to in the scale, and means operatively connecting the exercise bar to the movable bars of the scale assemblies, while said retaining means is disengaged from the rods said connecting means comprising chains secured at their upper ends to the movable bars of the scale assemblies, pairs of front and rear cables secured at their upper ends to the lower ends of the chains, pairs of front and rear lower pulleys journalled on the support beneath the platform, intermediate lower pulleys journalled on the support inwardly of said pairs of pulleys, one of said front cables being trained under a front pulley and around a related intermediate pulley and connected to one of said rods, the other of said front cables being trained under the other of said front pulleys and connected to the same rod, a rear cable being trained under a related rear pulley and connected to another of said rods, the other of said rear cables being trained under a related rear pulley and under a related intermediate pulley and connected to the other of said rods, the chains having equalizing turnbuckles incorporated thereon.

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