April 16, 1957 W. E. BERNE 2,788,971

PARALLEL BAR EXERCISING APPARATUS

Filed July 5, 1955 2 Sheets-Sheet 2

Fig. 2.

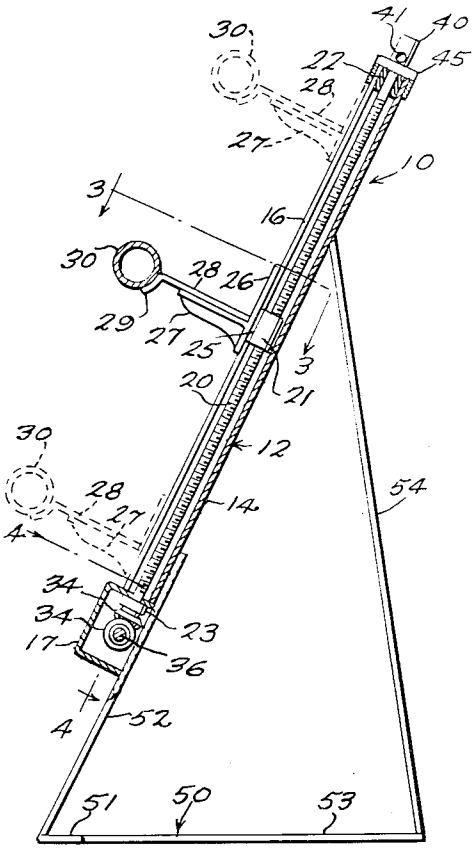


Fig. 3.

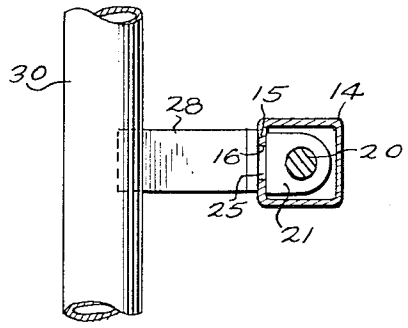
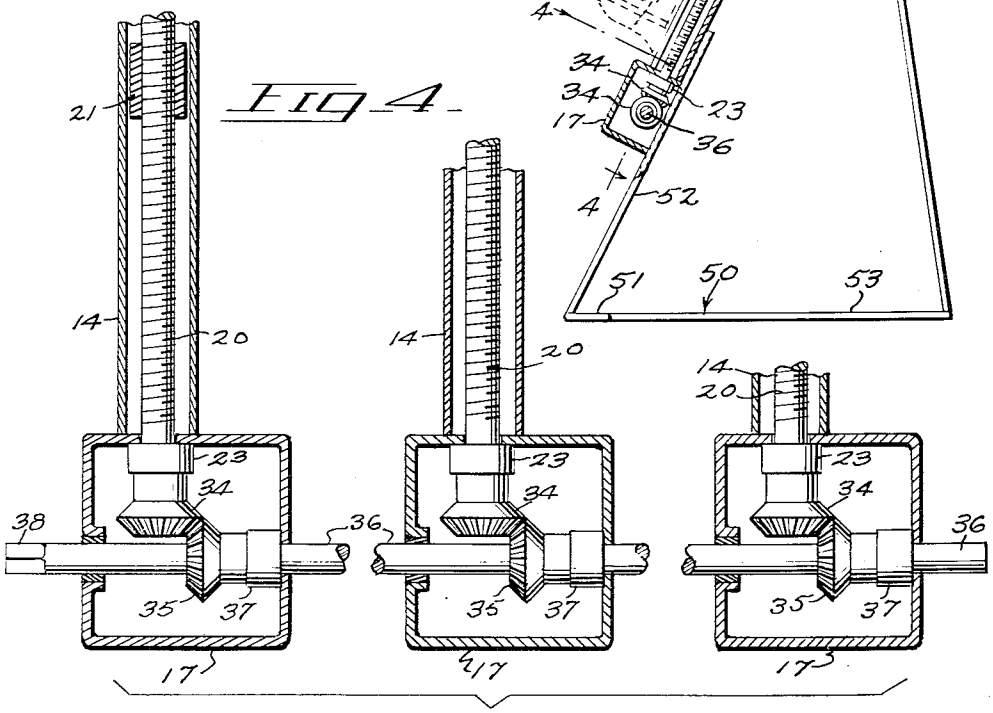


Fig. 4.



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April 16, 1957 W. E. BERNE 2,788,971

PARALLEL BAR EXERCISING APPARATUS

Filed July 5, 1955 2 Sheets-Sheet 1

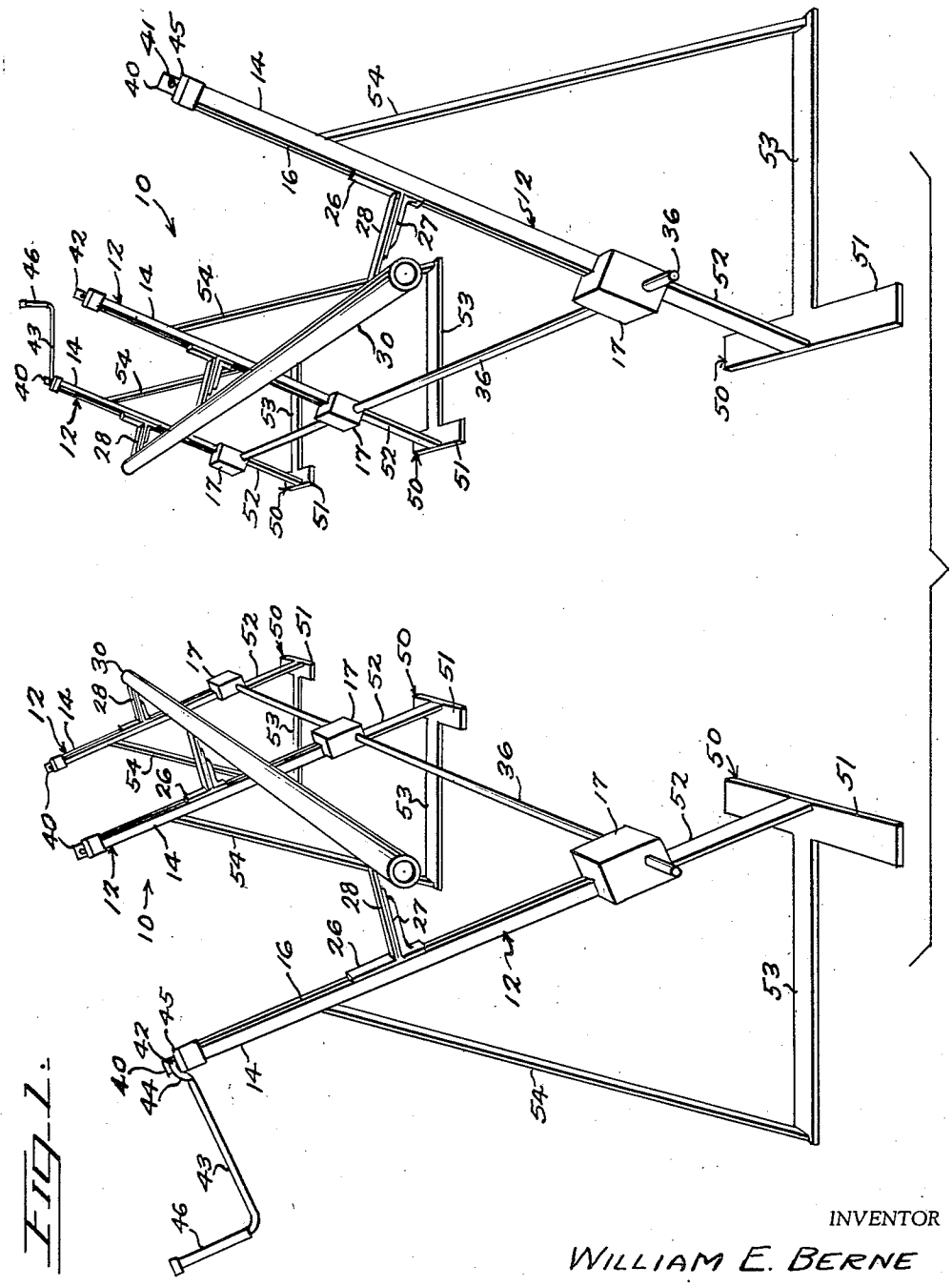


Fig. 1.

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PARALLEL BAR EXERCISING APPARATUS

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3 Claims. (Cl. 272—63)

This invention relates to parallel bars, and particularly to such bars for use in affording exercises for therapeutic treatments.

An important object of the invention is to provide an apparatus of the character referred to having rigidly supported parallel bars, and to provide in conjunction with such bars means for adjusting them both as to height and the distance apart of such bars, thus permitting the use of the apparatus by persons of substantially different heights.

A further object is to provide such an exercising apparatus wherein each parallel bar is supported by mechanism for adjusting it for the reason referred to and wherein a single operation adjusts each parallel bar.

A further object is to provide such an apparatus wherein each of the parallel bars is supported by a plurality of jack mechanisms the raising and lowering element of which is connected to the associated parallel bar and wherein all of the jack devices for each of the bars are simultaneously operable.

A further object is to provide such an apparatus having means for adjusting the parallel bars upwardly and downwardly, each adjustment being approximately at an angle of 20° to the vertical and the line of adjustment of each bar unit relative to the other bar unit diverging upwardly whereby the parallel bars may be adjusted downwardly for use by shorter people, with the bars arranged closer together, and upwardly for taller people with the bars arranged a greater distance apart.

A further object is to provide a mechanism of the character referred to wherein the jack mechanisms are of the nut and screw type and are identical with each other and have a common operating means whereby, through the operation of a single handle, each of the parallel bars may be adjusted as to height and the distance apart of the bars without the use of any locking or latching mechanism to support the bars in adjusted positions.

Other objects and advantages of the invention will become apparent during the course of the following description.

In the drawings I have shown one embodiment of the invention. In this showing:

Figure 1 is a perspective view of the apparatus as a whole looking lengthwise between the parallel bars;

Figure 2 is a central vertical sectional view through one of the jack devices and associated elements, parts being shown in elevation;

Figure 3 is a detail sectional view on line 3—3 of Figure 2; and

Figure 4 is a section taken substantially on line 4—4 of Figure 2, showing the operating means of the jack devices for one of the parallel bar units, parts being broken away.

Referring to the drawings, the numeral 10 designates each of a pair of parallel bar units which are identical in construction, and accordingly only one need be described in detail. Each unit 10 comprises a plurality

of jack devices each indicated as a whole by the numeral 12. The jack devices also are identical in construction, thus requiring the specific description of only one such device.

Referring to Figure 2, each jack device comprises a casing 14 which may be of the cross sectional shape shown in Figure 3, having a front wall 15 slotted as at 16 for a purpose to be described. Each casing 14 is substantially elongated, as will be obvious, and each is provided at its lower end with a gear housing 17 for a purpose to be described. Each casing 14 contains therein an operating screw 20 extending through and in threaded engagement with a nut 21, the screw being supported at its upper and lower ends in suitable bearings 22 and 23 which may be, and preferably are, conventional anti-friction bearings. Each nut 21 is provided with a laterally extending shank 25 projecting through the slot 16 and carrying a slide member 26 slidable over the adjacent face of the wall 15 to assist in supporting the nut 21 in alinement with the screw 20.

Each slide 26 carries, preferably as an integral part thereof, a bracket 27 to which is welded or otherwise secured to strap 28 the free end of which may be bent as at 29 substantially to fit an adjacent portion of a bar 30 forming one of the parallel bars of the apparatus and extending through the length thereof, as clearly shown in Figure 1. The strap ends 29 are preferably welded to the bars 30.

The lower end of each screw 20 (Figure 4) carries a bevel gear 34 in the associated gear housing 17. Each bevel gear 34 meshes with a similar gear 35 carried by a shaft 36. This shaft may be integral, and extends throughout the length of the apparatus and is mounted in bearings 37 carried by the gear housings 17. If desired, one end of the shaft 36 may be formed polygonal as at 38 (Figure 4) for the connection thereto of a wrench for rotating the shaft 36. This will form one means for simultaneously rotating the screws 20 of each unit 10, or another single means for this purpose may be resorted to, as referred to below.

Each screw 20 carries at the upper extremity thereof a head 40 having an opening 41 extending diametrically therethrough. This opening may receive the shank 42 of an operating crank 43 having a looped portion 44 adapted to engage a collar 45 carried by each head 40 and seating on the upper end of the associated casing 14. Such engagement of the loop 44 will support the crank 43 in the position shown, for example, at the left-hand side of Figure 1. The end of each operating crank carries a handle 46 which may be utilized for turning the screw 20 of any jack device to which the operating crank may be connected. The crank 43 may be swung upwardly and over the associated jack device, turning clockwise as viewed at the left-hand side of Figure 1, about the axis of the shank 42.

It will be apparent that the jack devices of each unit 10 are parallel to each other and that they are inclined to the vertical, this inclination being approximately 20°. It also will be apparent that the jack devices of the two units diverge upwardly at equal angles. The jack devices are supported in such position, and the supporting means, if desired, may be secured to the floor. Referring to Figures 1 and 2, it wil be noted that each jack device includes a T-shaped base member 50 the head portion 51 of which is in alinement with the corrresponding portions of the supporting bases of the other jack devices of each unit, as shown in Figure 1. Centrally thereof, each head portion 51 is welded or otherwise secured to an upwardly extending supporting shank 52 which may be flat, as shown, with its upper end portion welded against the back of the gear housing 17 and the back of the lower end portion of the casing 14. Accordingly, each casing 14,

its gear housing 17, and shank 52 are rigid with respect to each other.

Each base member 50 has its shank portion 53 projecting horizontally away from the head portion 51 and has its free end welded or otherwise secured to an angular brace member 54 at the lower end thereof. The upper end of such brace member is welded or otherwise secured to the back wall of the casing 14.

Operation

The two units 10 are arranged with respect to each other as shown in Figure 1 with the heads 51 of the bases 50 of the two units 10 arranged in parallel lines and spaced from each other a proper predetermined distance. The supporting bases preferably are bolted or otherwise secured to the supporting surface on which the apparatus is arranged. A crank 43 is connected to one of the heads 40 of each unit 10 and is turned to raise or lower the associated bar 30. Assuming that the cranks are connected as shown in Figure 1, rotation of the screw 20 of the nearest jack device at the left-hand side of the apparatus will rotate its associated bevel gear 34 (Figure 4), and this gear rotates the associated gear 35 to impart rotation to the shaft 36. This shaft through its remaining bevel gears 35 will similarly rotate the remaining screws 20 of the unit. The screws 20 of each unit being identical, the operation referred to will raise or lower the associated bar 30 according to the direction of rotation of the crank 43. The bar 30 of the other unit is similarly raised or lowered to its desired height, corresponding to the height of the left-hand bar 30 as viewed in Figure 1. Obviously, it is desirable that the parallel bars be arranged at the same height for the therapeutic exercising of a given patient. In actual practice, the apparatus is so designed that the bars 30 may be adjusted to a lowermost position approximately 17" from the floor to an uppermost position 44" above the floor.

Particular attention is invited to the fact that the vertical adjustment of the parallel bars changes the horizontal distance between the bars. Obviously, the taller the patient, the greater should be the distance between the bars 30, and it has been determined that an inclination of the jack devices at an angle of approximately 20° from the vertical automatically properly spaces apart the parallel bars 30 according to the height of the patient.

It will be apparent that the cranks 43, after being used to adjust the heights of the parallel bars, may be swung over the top of the jack device being directly adjusted, to assume an inoperative out-of-the-way position. It also will be apparent that instead of using the cranks 43, a box wrench or similar tool may be connected to the polygonal end 38 (Figure 4) to operate each shaft 36 directly. Such rotation of the shaft 36 will simultaneously and identically operate the screws 20 of each unit 10 to adjust the height of the associated bar 30.

From the foregoing it will be apparent that the present apparatus provides a highly useful exercise apparatus in the nature of parallel bars which may be adjusted both as to the horizontal spacing of the bars and the height thereof from the floor according to the height of the person using the apparatus. The apparatus has been found particularly useful and highly effective in the treatment of patients needing exercise on an apparatus of this character for the building up or rehabilitation of muscular weaknesses or deficiencies.

The construction illustrated embodies the invention in a preferred form, but it is intended that the disclosure be illustrative rather than definitive. The invention is defined in the appended claims.

I claim:

1. An exercising apparatus comprising a pair of parallel bar units each comprising a horizontal bar and a plurality of supporting and adjusting mechanisms for the horizontal bar, each supporting and adjusting mechanism comprising an elongated supporting casing, a base member therebelow, each base member being T-shaped and being provided with a head portion and a shank portion, the head portions of each unit being in alinement with each other and the shank portions of each unit being parallel to each other and projecting from said head portions away from the other unit, a supporting element fixed at its lower end to the head portion of each base member and fixed at its upper end with respect to the lower end portion of the associated elongated casing, a brace member connected at its lower end to the free end of the shank portion of each base member and at its upper end to the associated casing, the casings of each unit being parallel to each other and diverging upwardly from the casings of the other unit, a supporting bracket slidably connected to each casing and supporting the associated horizontal bar, and means for simultaneously adjusting the brackets of each unit parallel to the associated casing member, said units being spaced apart and the horizontal bars of the two units being in spaced parallel relation in any adjusted positions of said bars.

2. Apparatus according to claim 1 wherein the means for adjusting the brackets of each unit comprises a nut carried by each bracket, a screw in each elongated casing threaded through the associated nut, and means for simultaneously rotating said screws.

3. Apparatus according to claim 1 wherein the means for adjusting the brackets of each unit comprises a nut carried by each bracket, a screw in each elongated casing threaded through the associated nut, a gear housing carried by the lower end of each casing, a bevel gear in each housing, a shaft extending through all of the housings of each unit, and bevel gears carried by said shaft and each meshing with one of the first-mentioned bevel gears.

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