Feb. 1, 1966 G. P. NISSEN ETAL 3,232,609

PARALLEL BAR GYMNASTIC APPARATUS

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Fig. 1.

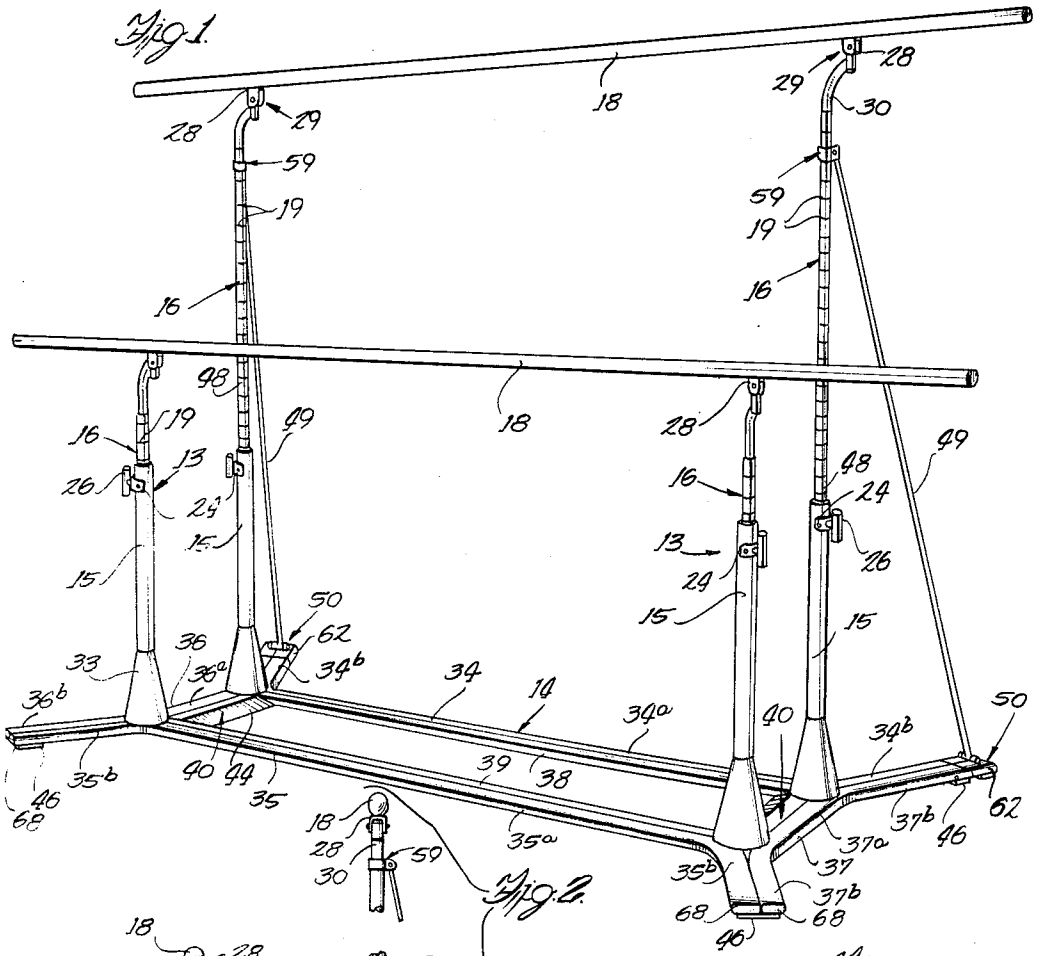


Fig. 2.

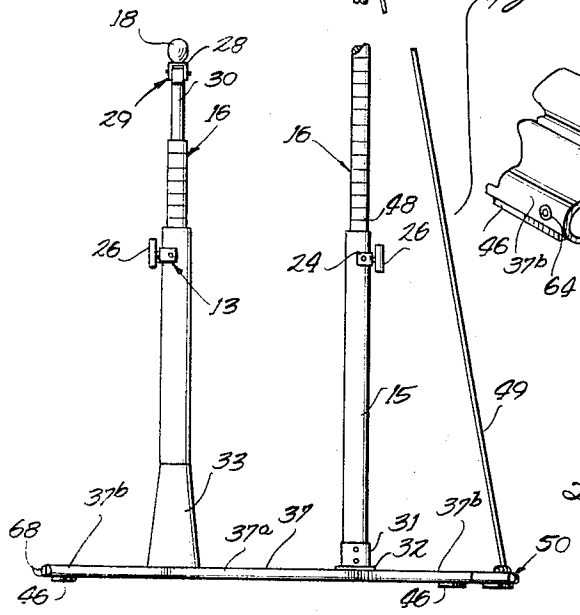
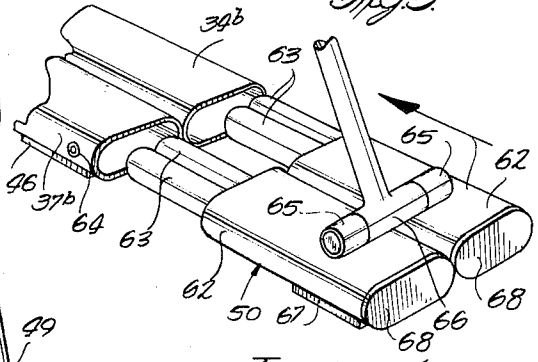


Fig. 3.



Inventors
George P. Nissen
Lawrence H. Conover
Howard P. Simmons
Attorney

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Fig. 4

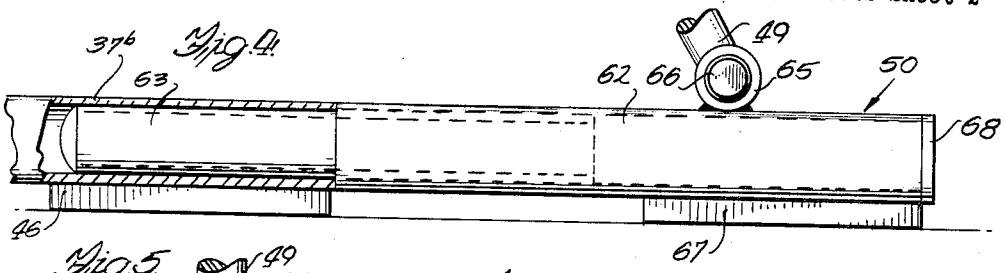


Fig. 5

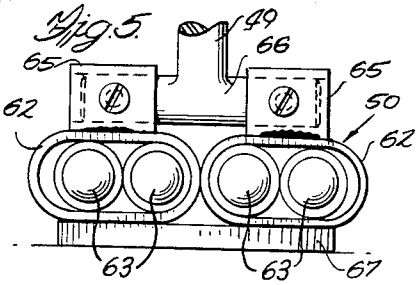


Fig. 6

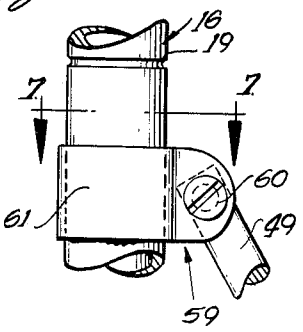


Fig. 7

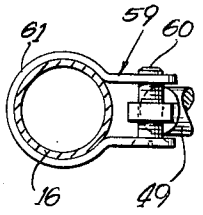


Fig. 10

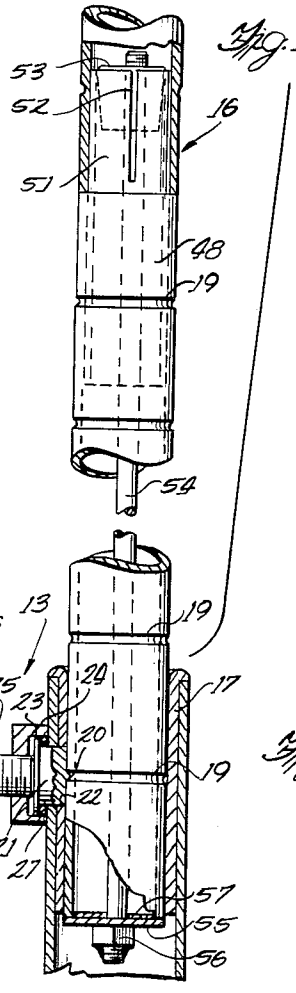


Fig. 8

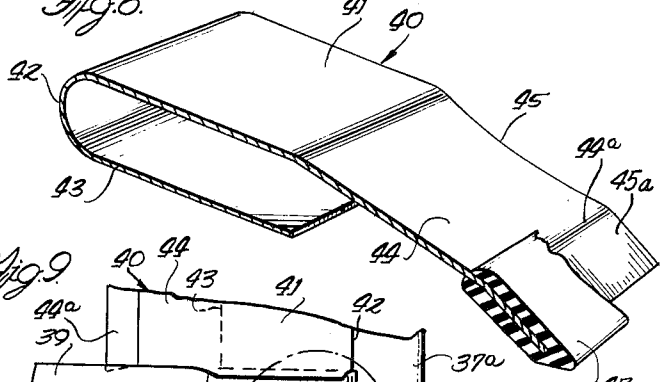


Fig. 9

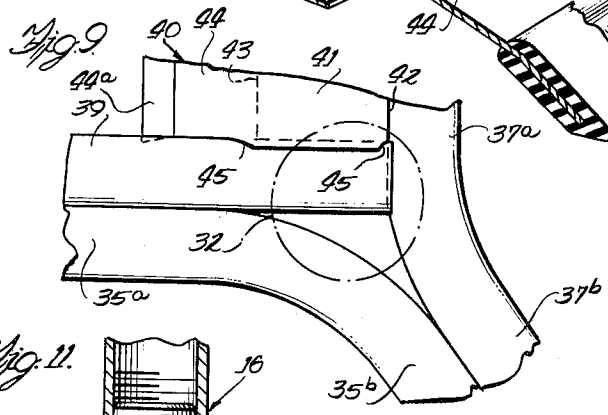
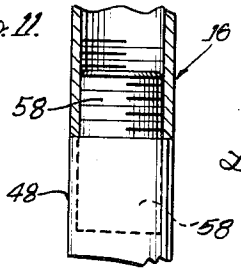


Fig. 11



Inventors
George P. Nissen
Lawrence H. Conover
Harry P. Simmons
Attorney

United States Patent Office

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PARALLEL BAR GYMNASTIC APPARATUS

George P. Nissen, and Lawrence H. Conover, Cedar Rapids, Iowa, assignors to Nissen Corporation, Cedar Rapids, Iowa, a corporation of Iowa

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6 Claims. (Cl. 272—63)

The present invention relates to gymnastic apparatus of the parallel bar type in which four hollow vertical posts upstand rigidly from four corners of a generally rectangular supporting base and four pistons telescoping within the respective posts are adjustable vertically to different heights to change the elevation of parallel horizontal bars mounted on the upper ends of the pistons. The bars are used either as even bars at the same height or as uneven bars with one higher than the other. When the bars are even, most of the motions of the performer are in a vertical plane between the bars and, when the bars are uneven, most of the motions are in a transverse vertical plane.

One object of the present invention is to provide a novel parallel bar construction enabling the same apparatus to be adapted quickly and easily for use either as uneven bars or as even bars.

Another object is to provide a novel adaptation kit providing extensions for two of the pistons and parts of the supporting base enabling the apparatus to be used for uneven parallel bar operation as well as even bar operation.

Still another object is to construct the supporting base of tubular and plate parts which are arranged in a novel manner to provide desired strength and stability and yet are of light weight and low cost.

A more detailed object is to construct the ends of the base in a novel manner of tubular and plate members which not only provide desired support, but also, avoid protruding surfaces likely to injure the performer.

Other objects and advantages of the invention will become apparent from the following detailed description taken in connection with the accompanying drawings in which:

FIGURE 1 is a perspective view of parallel bars embodying the novel features of the present invention and arranged for uneven parallel bar operation.

FIG. 2 is an end elevational view of the apparatus shown in FIG. 1, a shield being removed from one of the posts.

FIG. 3 is an enlarged fragmentary perspective view of a part of the base and an extension section for the post.

FIG. 4 is an enlarged fragmentary side elevational view of the base extension of FIG. 3.

FIG. 5 is an end elevational view of the extension of FIG. 4.

FIG. 6 is an enlarged fragmentary side elevational view of a brace bracket.

FIG. 7 is a sectional view taken along the line 7—7 of FIG. 6.

FIG. 8 is an enlarged fragmentary perspective view of a plate forming a part of one end of the supporting base.

FIG. 9 is a fragmentary plan view of one corner of the base with the upstanding posts removed.

FIG. 10 is an enlarged fragmentary side elevational view of one of the posts broken away in vertical section.

FIG. 11 is a fragmentary side elevational view of a modified piston construction.

The parallel bar apparatus shown in the drawings for purposes of illustration comprises generally a rectangular supporting base **14**, four hollow posts **15** upstanding rigidly from the four corners of the base, four pistons **16** telescoping closely within the bearings **17** in the posts

(FIG. 10), and two parallel bars **18** mounted on the upper ends of the pistons on opposite sides of the base. To accommodate persons of different height, the pistons are adjustable vertically within the posts and are secured releasably in their adjusted positions by means of individual clamps **13**.

In the present instance, the portions of the pistons **16** within the posts **15** are of cylindrical tubular construction with a plurality of axially spaced grooves **19** extending circumferentially around each piston to define different positions of adjustment of the piston within its associated post. The grooves receive an arcuate rib **20** on the reduced end portion of a plug **21** extending through an aperture **22** in the bearing sleeve **17** for the piston (see FIG. 10), the plug having an enlarged outer portion extending through an aperture in the upper end portion of the post and into a cylindrical recess **23** in a crescent-shaped bracket **24** which extends partially around the exterior of the post and is secured thereto as by set screws. Axially aligned with the plug recess in the bracket is a tapped aperture which receives a bolt **25** having a handle **26**. The plug normally is urged outwardly by a resilient O-ring **27** acting on the inner side of the enlarged end portion. When the bolt is retracted, the plug is shifted outwardly by the O-ring to permit axial sliding of the piston within the post until a desired axial adjustment is reached. At that time, the handle is turned to advance the bolt inwardly and shift the rib on the plug into a piston groove registering with the rib to lock the piston in place.

To permit one end of each parallel bar **18** to be raised at a time, the bar is connected to each piston **16** by means of a cradle **28** of U-shaped cross section having a universal joint connection **29** with the upper end of a solid rod or tube **30** whose other end portion is secured within the upper end portion of the piston. The upper end portion of the rod projects upwardly from the sleeve but is of goose-neck shape with a slight curvature so that, by simultaneous rotation of both pistons and rods supporting one horizontal bar, the latter may be shifted horizontally toward and away from the other horizontal bar and thereby vary the spacing of the bars. As is customary in this type of apparatus, the horizontal bars are single pieces of wood.

The posts **15** in the present instance are simply cylindrical tubes which receive the bearings **17** for the pistons **16** at their upper ends. At their lower ends, the tubes telescope within and are secured as by set screws to vertical sleeves **31** (FIG. 2). Flanges **32** projecting radially and outwardly from the lower ends of the sleeves lie flat against and are welded to upper flat horizontal surfaces on the four corners of the supporting base. The position of the flanges with respect to each corner is indicated in phantom in FIG. 9. Preferably, the lower end portion of each post and its sleeve are covered by a decorative conical shield **33**, such shield being removed from one post in FIG. 2 so as to reveal the sleeve.

As is well known, there are two types of parallel bar performances. In one type, the bars **18** are adjusted to the same height and many of the performer's movements are in a vertical plane extending longitudinally of the bars, such movements often bringing the performer's feet close to or actually in contact with the ends of the supporting base **14** located between the posts **15**. In the other type of performance known as uneven parallel bars, one bar is raised to a height substantially greater than the other bar as shown in FIGS. 1 and 2.

In one of its aspects, the present invention contemplates constructing the supporting base **14** of metal tubular and plate members which are arranged in a novel manner to provide the desired strength and stability for the apparatus while being of light weight and low cost and avoiding

protruding parts likely to injure a performer on the apparatus. To these ends, there are provided four outer tubular members 34, 35, 36 and 37 of generally U-shape, each including a straight central section and two straight end sections. The central sections 34*a*, 35*a*, 36*a* and 37*a* extend between the corners of the base to define the sides and ends of the rectangle and the end sections 34*b*, 35*b*, 36*b* and 37*b* flare diagonally and outwardly from the corners and lie against the end sections of the adjacent outer members. The end sections which lie side by side at each corner of the base and project diagonally and outwardly from the corner are secured rigidly together by welding at spaced points along their lengths. Preferably, the tubular members are of oval cross section flattened horizontally and providing generally flat upper and lower surfaces which lie in spaced horizontal planes.

Extending along and lying against the inner sides of the center sections 34*a* and 35*a* of the outer side members 34 and 35 are two inner side members 38 and 39 of oval cross section spanning the center sections 36*a* and 37*a* of the end members 36 and 37 and secured thereto by welding. The inner side members also are secured to the center sections of the outer side members by welding at spaced points with the flat upper and lower surfaces of the inner side members lying in the spaced horizontal planes of the flat upper and lower surfaces of the four outer members.

To increase the strength of the base and, at the same time, avoid projecting parts likely to be struck by the performer's feet, inner end members 40 adjacent the center sections 36*a* and 37*a* of the outer end members 36 and 37 are formed as plates presenting a smooth inclined upwardly facing surface to the performer. Each plate is of generally rectangular configuration with a flat center section 41 lying in the horizontal plane of the upper surfaces of the tubular side and end members and extending between and welded to the adjacent edges of the inner side members 38 and 39. From the center section, each inner end plate member first is curved downwardly as indicated at 42 (FIG. 8) to lie along the outer end member and then is bent reversibly into a flat end portion 43 which parallels the center section 41 and whose bottom surface lies in the same plane as the bottom surfaces of the outer end members 36 and 37. The flat end portion 43 and the curved section 42 are welded to the inner side members 38 and 39 at the side edges of the plate, and the outer side of the curved portion 43 also is welded to the inner edge of the adjacent outer end members 36 and 37.

To avoid projections likely to injure the performer's foot, the flat center section 41 of each end plate 40 merges smoothly with the other or inner end portion 44 of the plate and such end portion is inclined downwardly from the center section to terminate approximately in the plane of the lower surfaces of the outer end members 36 and 37. This inner end portion of the plate is recessed along its edges at two transversely spaced locations as indicated at 45 (FIGS. 8 and 9) to receive the curved inner edge of the inner side member, 38 or 39 as the case may be, to which this section is secured by welding. To obtain a more gradual mergence of the inner end portion 44 with the central section 41 of each plate and still extend the plate to the lower plane of the undersides of the tubular members, the outermost edge of that end portion of the plate is bent downwardly with respect to the remainder of that portion as indicated at 44*a*. The inner end members, by virtue of the reverse bending of the outer end portion 43 have the advantages of tubular construction and still avoid the presence of projections likely to injure the performer.

To avoid marring the floor of gymnasiums where the apparatus is used, it is preferred to secure thin pads 46 of a material such as rubber to the undersides of the outer end portions 34*b*, 35*b*, 36*b* and 37*b* of the outer side and end members 34, 35, 36 and 37. In the present instance, these pads are of rectangular shape and are secured to the tubular members by suitable screws. Further protection against marking the floors may be obtained as desired by elongated rubber guards 47 having laterally opening slots to receive the lower edge 45*a* of the inner end portion 44 of each of the inner end plate members 40 as shown only in FIGURE 8.

In accordance with another aspect of the present invention, novel means is provided to adapt the apparatus as described thus far for use as uneven parallel bars. This means comprises extensions 48 for the pistons 16, and, to stabilize the pistons when extended, diagonal braces 49 which are connected at opposite ends to the upper end portions of the extended pistons and to extensions 50 for the outwardly projecting diagonal parts of the base, the base extensions enabling the diagonal braces to operate at an efficient angle. The extension 48 for each of the two pistons for the higher parallel bar 18 is of the same exterior configuration as the pistons 16 and is secured to a part 51 which projects upwardly beyond one end of the extension and telescopes within and is secured to the lower end portion of the piston so that the adjacent ends of the piston and the extension abut each other in axial alinement and are rigidly connected so as to constitute a single piece.

In one form of piston connection shown in FIG. 10, the connecting part is a hollow sleeve 51 telescoping tightly within the upper end portion of the extension 48 and having a tight press fit therewith. The other end portion of the sleeve telescopes within the lower end portion of the piston and is expansible into gripping engagement with the inner wall of the piston 16. For this expansion, the upper end portion of the sleeve is split longitudinally as indicated at 52 and receives a conical plug 53 which is shiftable either axially into the sleeve to expand the sleeve axially out of the sleeve to permit its retraction.

The conical plug 53 for expanding the upper end portion of the sleeve 51 is shifted axially by a draw bar 54 which extends through the interior of the piston extension 48 and is accessible from the lower end thereof for manipulation to effect the shifting. In the present instance, the plug 51 also constitutes a nut which is threaded on the upper end portion of the draw bar. The other or lower end of the bar telescopes through a shouldered washer 55 and is welded to a nut 56 which abuts the outer side of the washer, the washer abutting the lower end of the extension and having a circular projection 57 telescoping within the extension to center the draw bar along the axis of the extension. With this construction, the lower nut 56 may be turned to pull the plug into the split end of the expanding sleeve. When the nut is turned in the opposite direction to move the draw bar and plug axially relatively to each other, the plug may be forced out of the split sleeve by striking an axial blow on the outer end of the bar.

In a modified construction shown in FIG. 11, the connecting part which projects upwardly beyond the piston extension 48 and into the piston 16 is a cylindrical rod 58 whose lower end portion telescopes closely within and is welded to the upper end portion of the extension. At its upper end portion, the rod is turned tightly into the lower end portion of the piston which is threaded for this purpose. The extenion and the rod are turned until the end of the extension and the piston shut each other tightly as shown in FIG. 11.

Each of the diagonal braces 49 is secured releasably at its upper end to the upper end portion of one of the extended pistons 16 by a clamp 59 in the form of a U-shaped bracket having two legs straddling the upper end portion of the brace and receiving a bolt 60 which extends through one leg and an aperture in the brace and is threaded into the other leg (FIGS. 6 and 7). The intermediate portion 61 of the clamp is cylindrical and large enough to telescope closely around the piston. The

clamp may be tightened or released simply by turning the bolt in opposite directions.

Each brace 49 is in the form of an elongated cylindrical rod of fixed length, the clamp 59 being released to permit axial shifting of the extended pistons 16 for raising and lowering the higher horizontal bars 18. To provide an effective angle for the brace, it is connected at its lower end to one of the extensions 50 which are secured to and project outwardly beyond and in alinement with the end portions 34*b*, 36*b* and 37*b* of the adjacent side and end base members 34, 36 and 37. The brace forms one leg of a triangle, the adjacent piston 16 and the post 15 form the second leg, and the base end portions with their extension form the third leg.

In the present instance, each base extension 50 comprises two oval tubular members 62 similar to the base tubular members and welded securely together in side by side relation the same as the outer end portions of the base members at each corner. At one corner, the extension tubes are alined with and abut the base end portions 34*b* and 37*b*. At the other corner on the same side of the base, the extension tubes abut and are alined with the end portions 34*b* and 36*b*.

To secure the extensions 50 in their proper alined relation with the end portions 34*b*, 36*b* and 37*b*, projections 63 rigid with the extension tubes 62 telescope within the end portions of the end members and are secured therein as by a set screw 64 which is threaded in one of the end portions (FIG. 3) at each corner of the base. The connection between the extension and its brace comprises two sleeves 65 welded to the respective tubes of the extension and receiving opposite ends of a cross bar 66 welded to the lower end of the base rod 49. As in the case of the main base members, rubber pads 67 are secured to the undersides of the extensions. To obtain a pleasing finished appearance of the apparatus, the exposed tube ends, either on the base members 34, 35, 36 and 37 or on the base extensions 50 are closed by removable plugs 68 of suitable resilient material such as rubber.

When it is desired to convert even parallel bars to uneven bars, first the post clamps 13 for one of the parallel bars 18 are released to permit the telescoping pistons 16 to be removed completely from their posts 15. Next, the extensions 48 are secured to the removed pistons and are inserted into the posts. Then, the plugs 68 on the appropriate end portions 34*b*, 36*b* and 37*b* of the base 14 are removed and the extensions 50 are secured to these end portions. Finally, after the extended pistons have been adjusted to their desired height and the post clamps have been retightened, the braces 49 are swung into position and the brace clamps 59 are affixed to the pistons. The apparatus then is prepared for use. If it is desired to change the height of the upper bar 18, the clamps 13 and 59 simply are loosened, the extended pistons 16 are adjusted, and the clamps are retightened.

It will be apparent that the piston extensions 48, braces 49, and base extensions 50 constitute a novel assembly by which even parallel bars 18 may be converted easily to uneven parallel bars having a desired rigidity by virtue of the tirangular relation of the parts. Further, it is apparent that the base 14 may be constructed simply and easily utilizing few tubular members and only two plate members 40 with the diagonal end portions 34*b*, 35*b*, 36*b* and 37*b* of the outer tubular members 34, 35, 36 and 37 cooperating to engage the supporting floor at widely spaced points so that the apparatus is very stable. Due to their novel shape, the plates 40 not only cooperate with the tubular members to provide a rigid frame structure, but also, achieve these ends while avoiding projecting parts likely to damage a performer in the event his feet swing down into engagement with the end members.

We claim:

1. In parallel bar gymnastic apparatus, the combination of a supporting base of generally rectangular configuration adapted to rest on a horizontal supporting surface and having elongated stabilizing sections extending diagonally and outwardly from the corners of the rectangle, four hollow tubular vertical posts upstanding rigidly from said four corners of said base, four cylindrical pistons telescoping within and guided for vertical adjustment relative to said posts, parallel bars each extending horizontally across and mounted on the tops of a different pair of said pistons, releasable clamps on said posts for holding said pistons in different selected positions of adjustment, and an adapter assembly for converting the apparatus for use as uneven parallel bars, said assembly comprising two base extensions secured to the outer ends of two of said stabilizing sections on one side of said base and extending the effective length of such sections, rigid elongated diagonal brace members having their lower ends connected to said extensions and their upper ends releasably clamped to the upper end portions of the pistons adjacent to the extensions, a pair of piston extensions of the same exterior configuration as said two adjacent pistons, said piston extensions being secured in abutting relationship to the lower ends of said adjacent pistons so as to extend the lengths of such pistons and position the associated parallel bar at a height substantially greater than the height of the other parallel bar.

2. The device of claim 1 wherein said piston extensions are secured to said pistons by means comprising, in the case of each such extension, a vertically disposed sleeve telescoping at its lower end portion tightly within the upper end portion of said extension and having a radially expansible upper end portion telescoping within the lower end portion of said piston, a conical plug telescoping within said radially expansible portion of said sleeve and shiftable axially of such portion to expand the same radially and outwardly into tight gripping engagement with the lower end portion of said piston, and a draw bolt connected at its upper end to said plug and extending axially downwards to beyond the lower end portion of said extension, the lower end of said bolt being both operative against the lower end portion of said extension and accessible in order to adjust said plug axially to expand said sleeve portion.

3. The device of claim 1 wherein said piston extensions are secured to said pistons by means comprising, in the case of each such extension, a cylindrical connecting member having one end portion telescoping within and secured rigidly to the abutting portion of said extension and its other end portion telescoping within and secured releasably to the abutting portion of said piston.

4. In parallel bar gymnastic apparatus, the combination of a supporting base of generally rectangular shape, four posts upstanding rigidly from the corners of said base, and two horizontal bars extending parallel to each other and the sides of said base being each mounted on a different pair of said posts, said base comprising a pair of tubular outer end members, a pair of tubular side members, and a pair of inner end members, each inner end member comprising a generally rectangular plate spanning said side members adjacent one of said outer end members, said plate having a horizontal section lying in a common horizontal plane with the upper plane of said side and outer end members, and an inclined section extending laterally from the side of said horizontal section remote from the adjacent one of said outer end members and inclining downwardly therefrom to the bottom plane of said side and outer end members, the ends of said inner end members being rigidly secured to their respective adjacent side members and the other sides of said horizontal sections being rigidly secured to their respective adjacent outer end members.

5. In parallel bar gymnastic apparatus, the combination of a supporting base of generally rectangular shape, four posts upstanding rigidly from the corners of said base, and two horizontal bars extending parallel to each other and the sides of said base being each mounted on a different pair of said posts, said base comprising a pair

of outer end members, a pair of side members, and a pair of inner end members, each inner end member comprising a generally rectangular plate spanning said side members adjacent one of said outer end members, said plate having a flat horizontal center section lying in a common horizontal plane with the upper plane of said side and outer end members, an outer section extending laterally from the side of said center section adjacent its adjacent outer end member, said outer section being first curled downwardly alongside the latter and then bent reversely into a common horizontal plane with the bottom plane of said side and end members, and an inner flat inclined section extending laterally from the other side of said central section and inclining downwardly therefrom to said bottom plane, the end edges of each of said inner end members being secured to their respective adjacent side members and the downwardly curled portions of said outer sections being secured to their respective adjacent outer end members.

6. In parallel bar gymnastic apparatus, the combination of a supporting base of generally rectangular shape, four posts upstanding rigidly from the corners of said base, and two horizontal bars extending parallel to each other and the sides of said base being each mounted on a different pair of said posts, said base comprising a pair of outer end members of generally U-shape having straight horizontal central sections forming parts of the ends of the rectangular base and horizontal straight end sections flaring diagonally outwardly from said base corners, a pair of straight inner side members spanning and welded at opposite ends to the ends of said central sections of said end members, a pair of outer side members of generally U-shape having straight central sections along side against said inner side members and welded to the latter and horizontal end sections flaring diagonally outwardly from said base corners and lying alongside against and welded to said end sections of said end members, all of said members being formed of horizontally flattened oval tubing having their upper and lower flattened surfaces lying in common upper and lower horizontal planes respectively, and a pair of inner end members, each inner end member comprising a generally rectangular plate spanning a pair of corresponding ends of said inner side members adjacent one of said outer end members, said plate having a flat central section lying in said upper plane, an outer section extending laterally from the side of said central section adjacent its adjacent outer end member, said outer section being first curled downwardly alongside the latter and then bent reversely into said lower plane, and an inner flat inclined section extending laterally from the other side of said central section and inclining downwardly therefrom to said lower plane, the end edges of said inner end members being welded to their respective adjacent inner side members and the downwardly curled portions of said inner end members being welded to their respective adjacent central sections of said outer end members.

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RICHARD C. PINKHAM, *Primary Examiner.*