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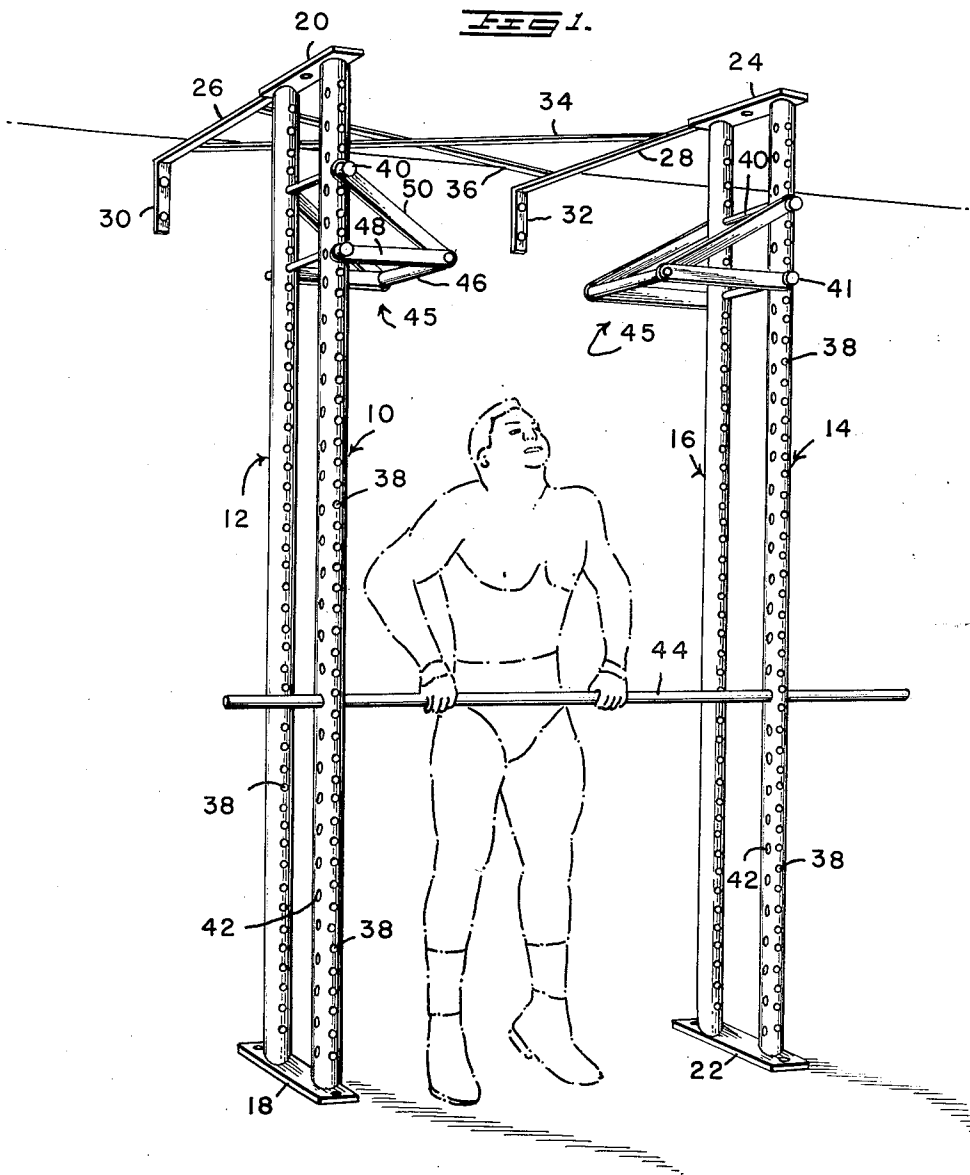
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EXERCISING RACK AND BAR APPARATUS

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3 Sheets-Sheet 1



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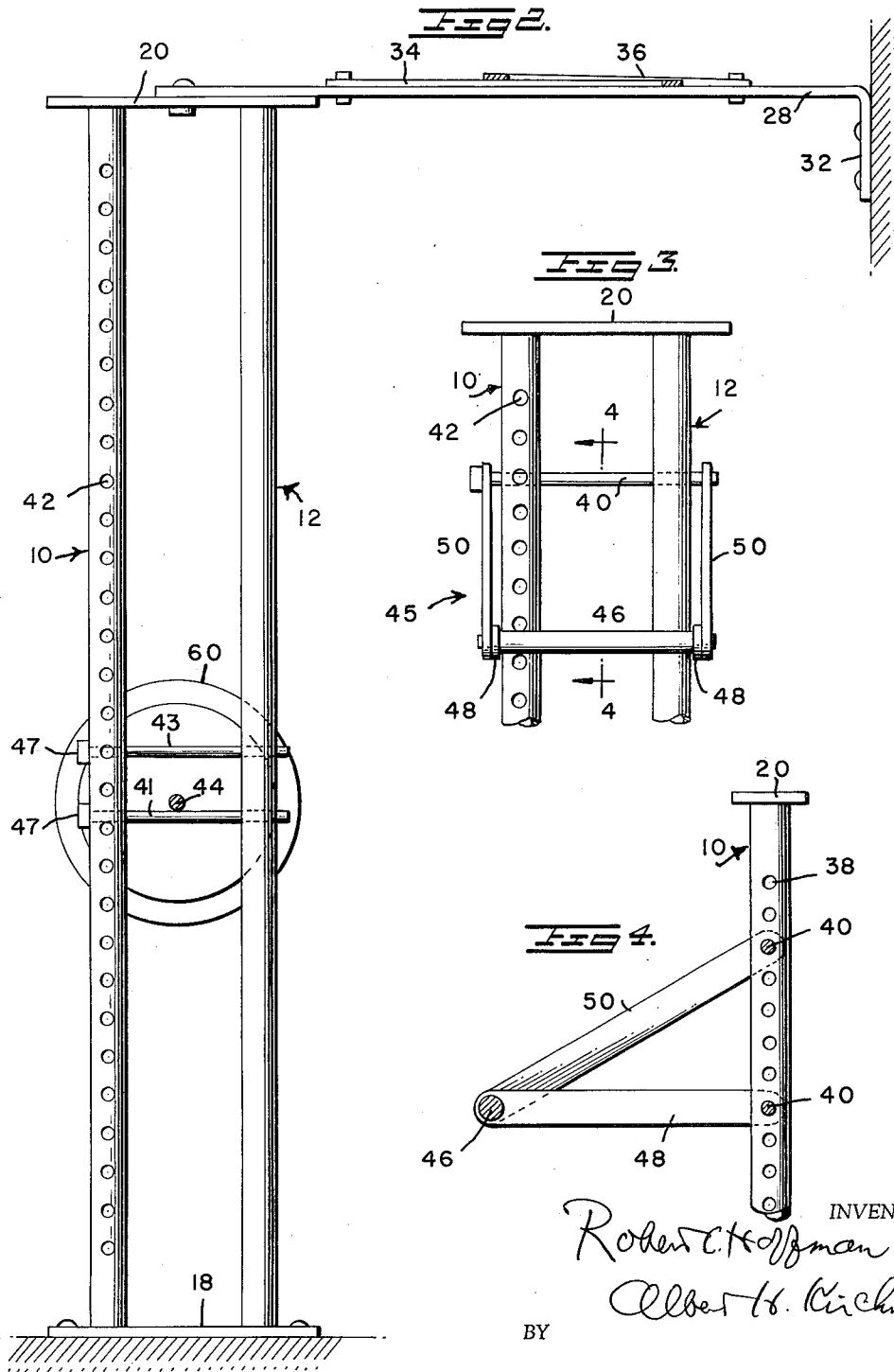
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3 Sheets-Sheet 2



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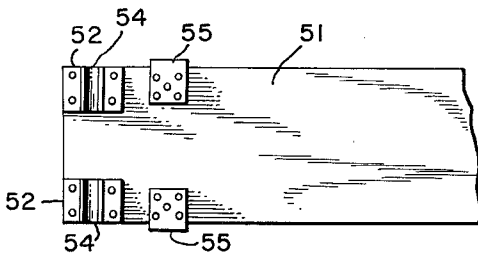
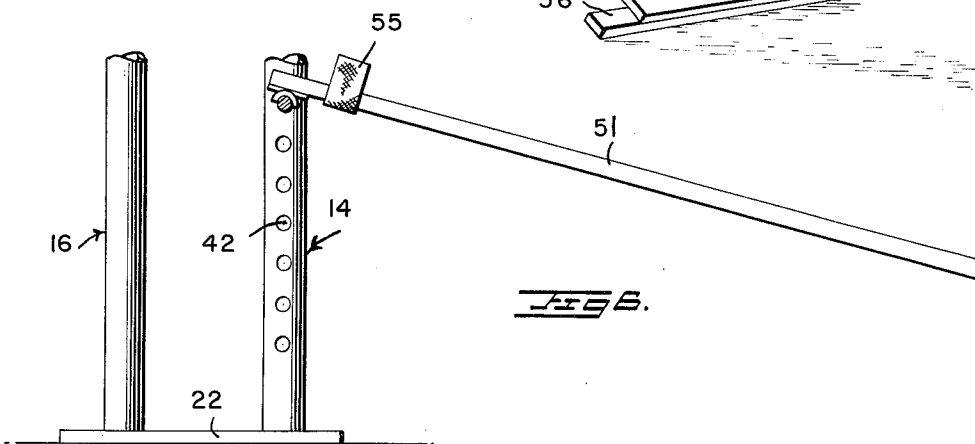
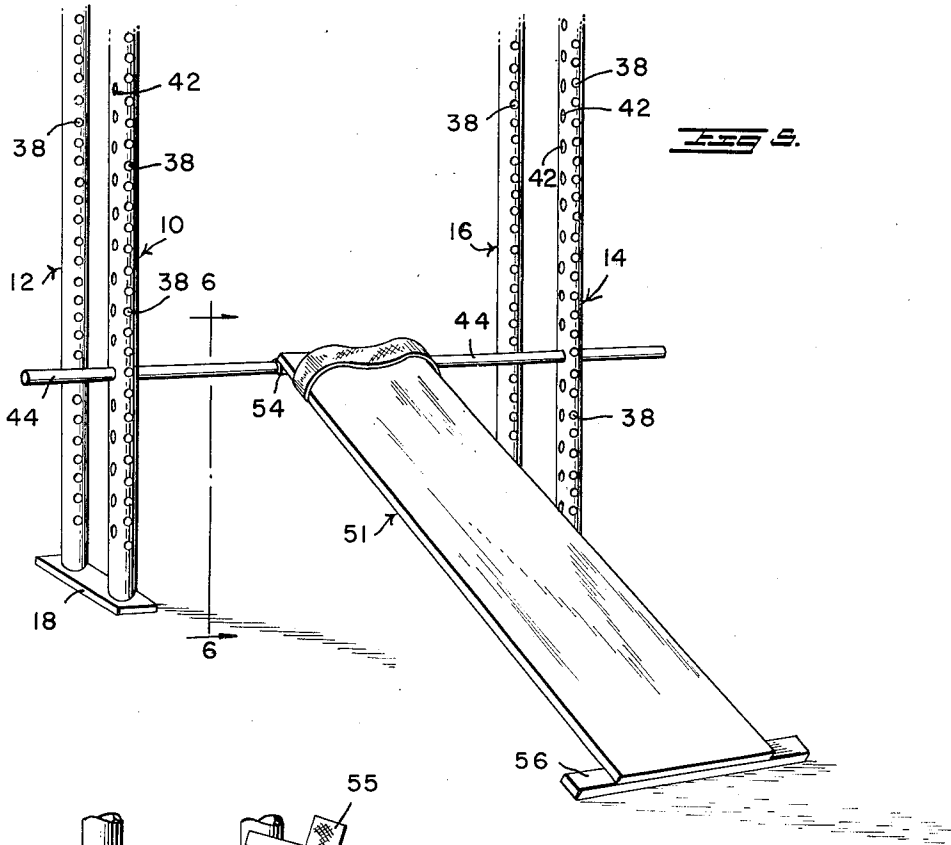
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EXERCISING RACK AND BAR APPARATUS

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3 Sheets-Sheet 3



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EXERCISING RACK AND BAR APPARATUS

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This invention relates to an exercising apparatus useful in performing body-building exercises, and more particularly to an apparatus which permits maximum development of muscles and bodily strength in a minimum of time and with a minimum of strain on the muscles, tendons and ligaments of the user of the apparatus.

For many years weight lifting exercises employing barbells have been widely used as a method of body building and of developing muscular strength. The weight lifting methods, apparatus and training systems heretofore used have required the practice of many exercises and have been time-consuming and fatiguing to the persons doing the exercises. Moreover, the weight lifting techniques previously used have required a considerable period of recuperation between training sessions, and much time was lost waiting for the muscles to become rested. Thus, when using the prior art apparatus and methods it was frequently necessary for the exerciser to take 24 to 36 hours of rest between exercise periods. As a result, long periods of time were required for a person to advance to a desired strength level as measured by his weight lifting ability.

Furthermore, the prior techniques of weight lifting imposed certain mental inhibitions upon the lifter which prevented him from making a maximum lifting effort. These inhibitions were caused by a fear of personal injury inherent in the sudden maximum muscle contractions that were inevitable with weight lifting techniques of the prior art.

Another disadvantage of the prior art techniques of weight lifting and muscle building is that they required that part of the muscle energy be used in shortening the length of the muscle, and that part of the energy be used in tensioning the muscle, whereas research in this field has shown that maximum muscle building and muscle cell development occur when all of the muscle energy is used in muscle tension and none is used in movement which shortens the muscle.

Still another disadvantage of the prior muscle building apparatus and methods is that they did not develop maximum strength in the position or direction in which the strength was to be used.

A further disadvantage of the weight lifting apparatus and methods of the prior art is that they are not properly related to the positions of movement used in lifting competitions, but rather provide isolated exercises having no planned or coordinated relationship to the weight lifting movements used in lifting competitions.

It is an object of the present invention to provide a weight lifting apparatus in which muscular strength can be increased much more rapidly than with the apparatus of the prior art, and in which the exercises are not as fatiguing to the user as in the prior art apparatus and methods.

It is another object of the invention to provide an exercising apparatus for muscle building which does not require long periods of rest and recuperation between training sessions.

Still another object of the invention is to provide an exercising apparatus for weight lifting which the weight lifter can use without fear of personal injury, thereby removing mental inhibitions which tend to limit the maximum weight lifting effort of the user.

Still another object of the invention is to provide an

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exercising apparatus for muscle development which permits exertion of force against an immovable object in a number of selected positions to permit maximum tension of different muscles without shortening of the muscles, thereby to promote maximum muscular development.

A further object of the invention is to provide an exercising apparatus for muscle development which trains the muscles and nervous system to give maximum coordinated effort in the position of needed force and which causes the weight lifter to execute all of the exercises in the various positions used in competitive weight lifting.

In achievement of these objectives, there is provided in accordance with this invention an exercise rack including two pairs of spaced uprights or standards, preferably steel pipe lengths. The two pairs of uprights are laterally spaced from each other by a distance sufficient to permit the exerciser to perform his exercises therebetween. The laterally spaced pairs of uprights are suitably secured to each other by cross braces at the upper end of the rack. The lower end of the rack is suitably anchored to a floor surface, while the upper end of the rack is suitably secured to an adjacent wall or equivalent fixed object by bracket members extending rearwardly from the rack.

Each pair of uprights includes a forward upright and a rear upright spaced from the forward upright by a distance of approximately nine to twelve inches. Each of the steel pipe uprights is provided with drilled holes at close vertical intervals throughout the entire height of the front and rear faces thereof. The forward upright at each side of the rack is provided with drilled holes extending at close vertical intervals throughout the entire height of each of the opposite side faces thereof. An exercise bar without weights thereon may be extended through and positioned in the holes in the side faces of the opposite forward uprights, so that the bar serves as an immovable object against which pushing or pulling forces may be exerted by the exerciser. Alternatively, a bar with weights thereon may be positioned in the space between the forward and rear uprights and be movable through a limited range of vertical movement as determined by the vertical spacing between supporting pins and retaining pins positioned at vertical spacing in the holes through the front and rear faces of the respective uprights. In addition, a chinning sub-assembly, including parallel chinning bars, may be detachably secured by removable pins to opposite sides of the upper portion of the exercise rack. Also, as a further feature, an abdominal exercise board may be detachably supported by a cross bar extending through the holes in the lower portion of the side faces of the opposite forward uprights.

Further objects and advantages of the invention and the details of a preferred embodiment will become apparent from the following description taken in conjunction with the accompanying drawings in which:

FIG. 1 is a perspective view of an exercising apparatus or exercising rack in accordance with the invention;

FIG. 2 is a side elevation view of one of the two pairs of standards of the exercising apparatus of FIG. 1, showing in cross section a barbell supported at one end by the support pin of the apparatus;

FIG. 3 is an elevation view, partially cut away, of the upper end portion of the pair of the uprights or standards at one side of the exercising apparatus, and showing one of the parallel chinning bars supported by said pair of uprights;

FIG. 4 is a view in vertical section along the line 4—4 of FIG. 3;

FIG. 5 is a perspective view of the lower portion of the exercising apparatus, showing an abdominal board supported at one of its ends by the bar of the apparatus;

FIG. 6 is a view in vertical section along the line 6—6 of FIG. 5; and

FIG. 7 is a plan view of the under surface of the abdominal board of FIGS. 5 and 6.

Referring now to these drawings, and more particularly to FIG. 1, the exercising apparatus of the invention may be designated as an "exercise rack" and includes a first pair of uprights or standards 10 and 12 on one side of the rack and a second pair of uprights or standards generally indicated at 14 and 16 on the opposite side of the rack. The four uprights are preferably stout steel pipe sections of approximately 2½ inches outside diameter. Each pair of uprights is welded at its upper and lower ends to a steel plate. Thus, uprights 10 and 12 are welded at their lower ends to steel plate 18 and at their upper ends to steel plate 20, while uprights 14 and 16 are welded at their lower ends to steel plate 22 and at their upper ends to steel plate 24. The uprights 10-12 and 14-16 on the opposite side of the rack lie in a common vertical plane parallel to but spaced laterally from the vertical plane of uprights 14 and 16 on the opposite side of the rack. The lateral spacing between the plane of uprights 10-12 on one side of the rack and the plane of the uprights 14-16 on the opposite side of the rack is sufficient to permit the exerciser to stand between the two sides of the rack as shown in FIG. 1 with ample clearance to perform the exercises for which the rack is designed.

The two front uprights 10 and 14 at opposite sides of the rack lie in a common plane at the forward side of the apparatus, while the two rear uprights 12 and 16 lie in a common plane which is parallel to but spaced rearwardly of the plane of uprights 10 and 14 by a distance of approximately five inches. The four uprights 10, 12, 14 and 16 are preferably eight feet in height.

The exercise rack is anchored to the floor of the room where it is installed by means of suitable anchor bolts or the like extending through apertures in the steel plates 18 and 22 at the lower ends of the uprights. The rack assembly is positioned at an outward spacing from an adjacent wall or other fixed object a distance sufficient to give the exerciser ample room to perform his exercises, and the upper end of the rack is secured to the adjacent wall or the like by opposite bracket members 26 and 28 which are secured at their outer ends to the top steel plates 20 and 24. Bracket members 26 and 28 include depending right angle portions 30 and 32 which are suitably anchored to the adjacent wall.

Braces 34 and 36 extend in diagonally crossed relation between the rearwardly-extending brackets 26 and 28 and maintain the opposite sides of the rack in rigidly assembled and properly spaced relation.

A plurality of holes 38 of approximately 3-inch diameter are drilled in the forward and rear surfaces of each of the uprights 10, 12, 14 and 16. Holes 38 are preferably positioned at 2-inch vertically-spaced intervals along the entire height of each of the uprights. Since the uprights are 8 feet high, forty-eight of the holes 38 are provided in each of the front and rear surfaces of each of the uprights, each upright having a total of ninety-six of the holes 38.

Each of the holes 38 in the front surface of each upright is aligned with a corresponding hole 38 in the rear surface of the same upright, and these two holes are properly aligned with a corresponding pair of holes 38 in the other upright on the same side of the rack. Also, the four corresponding holes 38 in a given horizontal plane of the two uprights on one side of the rack lie in exactly the same horizontal plane as the front and rear holes 38 of each of the uprights on the opposite side of the rack. Steel pins such as those indicated at 40, 41 and 43 in FIGS. 1-4 extend in a front-to-rear direction through the four aligned holes 38 of the forward and rear uprights on each respective side of the rack. Each of the pins 40, 41 and 43 is of identical construction, and each includes a

head portion 47 to facilitate positioning or withdrawal of the pin with respect to a set of holes 38.

The forward uprights 10 and 14 are each provided on each of its side surfaces with a vertical row of holes 42. The holes 42 of each upright 10 and 14 are of approximately 2-inch diameter and are spaced at 3-inch vertical intervals along the entire height of each respective forward upright to provide a total of thirty-two of the holes 42 on each side of each 8-foot upright. The holes 42 on opposite sides of each forward upright are accurately positioned at corresponding vertical levels to permit the exercise bar 44 to extend through the corresponding holes 42 in the opposite sides of each upright 10 and 14, as best seen in FIG. 1.

Parallel chinning bar sub-assemblies generally indicated at 45 may also be attached to the opposite sides of the exercise rack adjacent the upper end thereof. Each of the sub-assemblies 45 includes a chinning bar 46 having a horizontal support arm 48 and an inclined support arm 50 rigidly attached thereto. Support arm 50 is inclined at an angle of substantially 45 degrees with respect to the horizontal support arm 48 and with respect to the chinning bar 46. Horizontal support arm 48 and inclined support arm 50 at each end of each of the chinning bars 46 are provided with holes which are in mating alignment with a pair of vertically spaced holes 38 of the front and rear uprights at each side of the exercise rack. This permits each of the chinning bar sub-assemblies 45 to be detachably connected to the uprights 10-12 or 14-16 by means of the pins 40 which extend through the aligned holes in the arms 48 and 50 at the forward and rear sides of the respective chinning bar sub-assemblies and through the aligned holes 38 of the uprights on the corresponding side of the rack. The parallel chinning bars 46 at opposite sides of the exercise rack permit the performance of chinning exercises, as well as performance of the exercise known as the "frog kick."

As best seen in FIGS. 5, 6, and 7, the exercise rack is also adapted to be fitted with the abdominal board generally indicated at 51 which is used for exercises which develop muscles in the abdominal region. The abdominal board is approximately six feet long and includes on its under surface at one end thereof bearing plates 52 each having a semi-cylindrical bearing member 54 which engages the surface of the cross-bar 44 to hold the upper end of board 51 securely in position when the board is in use. The abdominal board also includes a strap member 55 which extends across the outer surface at the end of the board which is supported by bar 44, the ends of strap member 55 extending beneath and being secured to the under surface of the board. Strap member 55 is used to hold the feet of the exerciser in place. The opposite end of board 51 includes a cross member 56 which rests on the surface of the floor. When used with abdominal board 51, cross bar 44 is positioned at a rather low height, as, for example, two feet above the surface of the floor, which causes the abdominal board to be inclined at an angle of approximately 20 degrees with respect to the horizontal. When the abdominal board is mounted on bar 44 as shown in FIGS. 5 and 6, the exerciser lies with his feet hooked under strap 55 at the upper end of the board and with his head at the lower end of the board, and raises himself from the waist to strengthen muscles in the abdominal region.

When using the exercise rack of the invention for exercises which do not require movement of weights or shortening of muscle length, the bar 44 is positioned as shown in FIG. 1 so that it extends through the aligned holes 42 in the sides of the respective forward uprights 10 and 14. When bar 44 is used in this manner, no weights are mounted on the bar, and the maximum force of which the exerciser is capable, either a push or a pull depending on the height of the bar and the particular exercise which is being performed, is exerted on bar 44 to exercise the muscles.

With bar 44 located in the holes 42, as shown in FIG. 1, no actual movement of the bar occurs during the pushing or pulling effort since the engagement of bar 44 with the holes 42 makes the bar immovable. Thus, all of the muscle energy is used in muscle tension and none of the muscle energy is used in shortening movement of the muscle. Research in this field has shown that improved muscle building and muscle cell development occur under these conditions.

In a typical day's training schedule using the bar 44 without weights, the bar is positioned at various levels on the forward uprights 10 and 14. For example, in addition to the position shown in FIG. 1, the bar may be positioned at a level above the head of the exerciser, so that the exerciser must extend his arms to full length above his head to reach and exert force against the bar. In another exercise, the bar 44 may be positioned at approximately chin height. In still another position, bar 44 may be at a height where it will rest on the back and shoulders of the exerciser when he is in squatting position. In another position, corresponding to still another exercise, the bar 44 may be positioned several inches below the knees of the exerciser when he is in standing position. In all of these various positions of bar 44, the exerciser exerts maximum pushing or pulling force, to provide a single hard muscular contraction lasting for a period of six to twelve seconds for the respective exercise. It has been found that a single muscular contraction provided by exerting a force against an immovable object tends to provide maximum muscular development. By adjusting the bar 44 to various levels, different muscles or groups of muscles may be properly conditioned by exerting a single strong pushing or pulling force of short duration upon the bar 44.

The exercise rack may also be used for exercises in which weights 60 are mounted on opposite ends of the bar 44. When using weights on the bar, the bar is moved vertically in the space between the forward and rear uprights. As best seen in FIG. 2, support pins 41 are positioned in the aligned holes 38 of the forward and rear uprights 10-12 and 14-16, respectively, on opposite sides of the exercise rack, and retaining pins 43 are positioned at a higher level, preferably two holes above pins 41 on each side of the rack. This vertical spacing between support pins 41 and retaining pins 43 permits a limited vertical movement of four inches of bar 44 and the weights 60 mounted thereon.

As best seen in FIG. 2, bar 44 with weights 60 mounted thereon is positioned between the forward and rear uprights, and when not in use rests on the lower supporting pins 41 at opposite sides of the rack. The exerciser may lift the bar 44 and weights 60 mounted thereon through a limited range of movement, as determined by the height of the upper retaining pins 43 above the lower supporting pins 41. The lower supporting pins 41 and the upper retaining pins 43 on each side of the rack may be adjusted to various vertical positions corresponding to exercises which are to be performed, with a vertical spacing always being maintained between pins 41 and 43 to permit limited vertical movement of bar 44 and weights 60.

The exercise rack hereinbefore described has certain definite advantages as compared to exercising apparatus heretofore used, whether the rack is being used with the bar 44 without weights and held in an immovable position in holes 38 as shown in FIG. 1, or whether the rack is being used with the bar 44 having weights 60 mounted thereon and movable through a limited range of movement between the supporting pins 41 and retaining pins 43.

The exercise rack permits the exercises to be performed without fatigue associated with apparatus heretofore used, and permits the exerciser to exercise daily without long periods of recuperation between sessions. Furthermore, the exercise rack by permitting a definite positioning of the bar 44 either in an immovable position or in a posi-

tion having a limited range of movement permits the exercises to be performed with gradual muscle contractions, rather than sudden muscle contractions and thereby removes mental inhibitions previously associated with weight lifting which frequently prevented the lifter from exerting a maximum lifting effort. The exercise rack, particularly when used with the bar 44 in the immovable position in holes 38, permits a maximum amount of muscle energy to be applied to tensioning the muscle, rather than requiring part of the muscle energy to be diverted into shortening of the muscle, thereby providing improved muscle building and muscle cell development. Furthermore, the exercise rack permits the force of the exerciser to be exerted for any given exercise in the direction or position of the needed force for the given exercise. Also, the rack permits the weight lifting to be performed in the various positions used in competitive weight lifting and thus is an ideal training device for those who wish to engage in weight lifting competitions.

The parallel chinning bars and the abdominal board also cooperate with the exercise rack to permit diversified exercises which further improve the bodily strength and muscular development of the user.

While there has been shown and described a particular embodiment of the invention, it will be obvious to those skilled in the art that various changes and modifications may be made therein without departing from the invention, and therefore it is aimed to cover all such changes and modifications as fall within the true spirit and scope of the invention as defined by the appended claims.

What is claimed is:

1. An exercise apparatus comprising a first and a second pair of uprights, each of said pairs including a forward and a rear upright spaced from each other and lying in a vertical plane parallel to the plane of the forward and rear uprights of the opposite pair, said pairs of uprights being laterally spaced from each other to permit the performance of exercises therebetween, first connection means rigidly securing the lower end of the uprights of each pair together, said first connection means of each pair of uprights including means adapting said first connection means for attachment to a floor surface, second connection means rigidly securing the upper ends of each pair of uprights to the upper ends of the other pair of uprights, means forming part of said apparatus for rigidly securing the upper ends of said uprights to a surface adjacent said upper ends, a first set of holes positioned at frequent vertically-spaced intervals in a corresponding one upright of each pair, said holes of said one upright of each pair having horizontal axes extending in horizontal planes corresponding to the planes of the axes of the holes of said one upright of the other pair, said sets of holes of both of said one uprights lying in a common vertical plane, whereby an exercise bar may be supported adjacent its opposite ends in selected vertical positions in the holes of said one upright of both of said pairs of uprights and be immovable in a vertical plane when so supported, a second set of holes positioned at frequent vertically-spaced intervals in said one upright of each pair and having axes extending perpendicularly to the axes of said first set of holes and extending in the front-rear direction of said apparatus, the second set of holes of said one upright of each pair having axes lying in horizontal planes corresponding to the planes of the axes of the second set of holes of the other said upright, a third set of holes formed in the other upright of each pair and horizontally aligned with the second set of holes of said one upright of each pair, and at least one pin member positioned in corresponding holes of the second and third sets in the forward and rear uprights on each of the opposite sides of said apparatus, whereby an exercise bar lying in the space between said forward and rear uprights may have its movement in a vertical plane limited by said pin members.

2. An apparatus as defined in claim 1 including a second pin member on each of the opposite sides of said apparatus, cooperating with said first named pin member to provide a lower supporting pin and an upper retaining in, each of said pins being supported adjacent its opposite ends thereof in vertically spaced relation to the other pin in corresponding holes of the second set in the pair of forward and rear uprights on each of the opposite sides of said apparatus, whereby said exercise bar may be disposed in the space between said forward and rear uprights and have its movement in a downward direction limited by said supporting pins on opposite sides of the apparatus and have its movement in an upward direction limited by said retaining pins on opposite sides of the apparatus.

3. An exercise apparatus comprising a first and a second pair of uprights, each of said pairs including a forward and a rear upright spaced from each other and lying in a vertical plane parallel to the plane of the forward and rear uprights of the opposite pair, said pairs of uprights being laterally spaced from each other to permit the performance of exercises therebetween, first connection means rigidly securing the lower ends of the uprights of each pair together, said first connection means of each pair of uprights including means adapting said first connection means for attachment to a floor surface, second connection means rigidly securing the upper ends of each pair of uprights to the upper ends of the other pair of uprights, bracket means attached to the upper ends of said uprights for securing said apparatus in a rigidly fixed spaced relation to a wall adjacent the apparatus, a first set of holes in each of said forward uprights at frequent vertically-spaced intervals and having horizontal axes extending in horizontal planes corresponding to the planes of the axes of the holes of the other forward upright, the axes of said holes of both of said forward uprights extending in a common vertical plane, whereby an exercise bar may be supported adjacent its opposite ends at selected vertical positions in the holes of both of said forward uprights and be immovable in a vertical plane when so supported, a second set of holes positioned at frequent vertically-spaced intervals in each of said uprights and having axes extending perpendicularly to the axes of said first set of holes, the second set of holes of each of said uprights having axes lying in horizontal planes corresponding to the planes of the axes of the second set of holes of the other said uprights, a third set of holes formed in the other upright of each pair and horizontally aligned with the second set of holes of said one upright of each pair, and at least one pin member positioned in corresponding holes of the second and third sets in the forward and rear uprights on each of the opposite sides of said apparatus, whereby an exercise bar lying in the space between said forward and rear uprights may have its movement in a vertical plane limited by said pin members.

4. An exercise apparatus comprising a first and a second pair of tubular metal uprights, each of said pairs including a forward and a rear upright spaced from each other and lying in a vertical plane parallel to the plane of the forward and rear uprights of the opposite pair, said pairs of uprights being laterally spaced from each other to permit the performance of exercises therebetween, a first plate rigidly securing the lower ends of the uprights of each pair together, said first plate including means adapting said first plate for attachment to a floor surface, a second plate rigidly securing the upper ends of the uprights of each pair together, brace means rigidly securing the upper ends of each pair of uprights to the upper ends of the other pair of uprights, bracket means attached to the upper ends of said uprights for securing said apparatus in a rigidly fixed spaced relation to a wall adjacent the apparatus, a first set of holes in diametrically opposite sides of each of said forward tubular metal uprights

at frequent vertically-spaced intervals, said holes of each forward upright having horizontal axes extending in horizontal planes corresponding to the planes of the axes of the holes of the other forward upright, said holes of both of said forward uprights lying in a common vertical plane, whereby an exercise bar may be supported adjacent its opposite ends at selected vertical positions in the holes of both of said forward uprights and be immovable in a vertical plane when so supported, a second set of holes positioned at frequent vertically-spaced intervals in each of said uprights and having axes extending perpendicularly to the axes of said first set of holes and extending in the front-rear direction of said apparatus, the second set of holes of each of said uprights having axes lying in horizontal planes corresponding to the planes of the axes of the second set of holes of the other said upright, a third set of holes formed in the other upright of each pair and horizontally aligned with the second set of holes of said one upright of each pair, and at least one pin member positioned in corresponding holes of the second and third sets in the forward and rear uprights on each of the opposite sides of said apparatus, whereby an exercise bar lying in the space between said forward and rear uprights may have its movement in a vertical plane limited by said pin members.

5. An exercise apparatus comprising a first and a second pair of uprights, each of said pairs including a forward and a rear upright spaced from each other and lying in a vertical plane parallel to the plane of the forward and rear uprights of the opposite pair, said pairs of uprights being laterally spaced from each other to permit the performance of exercises therebetween, first connection means rigidly securing the lower ends of the uprights of each pair together, said first connection means of each pair of uprights including means adapting said first connection means for attachment to a floor surface, second connection means rigidly securing the upper ends of each pair of uprights to the upper ends of the other pair of uprights, means forming part of said apparatus for rigidly securing the upper ends of said uprights to a surface adjacent said upper ends, a set of holes positioned at frequent vertically-spaced intervals in the other said upright and having axes extending in the front-rear direction of said apparatus, said holes of each of said uprights having axes lying in horizontal planes corresponding to the planes of the axes of the holes of each of the other uprights, and at least one pin member positioned in corresponding holes in a pair of forward and rear uprights on each of the opposite sides of said apparatus, whereby an exercise bar lying in the space between said forward and rear uprights may have its movement in a vertical plane limited by said pin members.

6. An apparatus as defined in claim 5 including a second pin member on each of the opposite sides of said apparatus, cooperating with said first named pin member to provide a lower supporting pin and an upper retaining pin, each of said pins being supported adjacent its opposite ends in vertically spaced relation to the other pin in corresponding holes in a pair of forward and rear uprights on each of the opposite sides of said apparatus, whereby said exercise bar lying in the space between said forward and rear uprights and between said pins may have its movement in a downward direction limited by said lower supporting pins on opposite sides of the apparatus and may have its movement in an upward direction limited by said upper retaining pins on opposite sides of the apparatus.

7. In combination with the exercise apparatus defined in claim 5, a chinning bar sub-assembly attached to each of the opposite pairs of uprights adjacent the upper ends of said uprights, each chinning bar sub-assembly including a chinning bar extending in the front-rear direction of the apparatus and parallel to and laterally spaced in-

wardly of the inside surfaces of its corresponding forward and rear uprights, a separate horizontal arm connected to each of the respective opposite ends of each chinning bar, a separate inclined arm connected to each of the respective opposite ends of each chinning bar, and separate pins connecting said horizontal and inclined arms of each chinning bar to the corresponding forward and rear uprights, said pins being supported in said holes of said forward and rear uprights.

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