May 26, 1964 R. J. HARWOOD 3,134,378

EXERCISE MACHINE

Filed Oct. 10, 1960 6 Sheets-Sheet 1

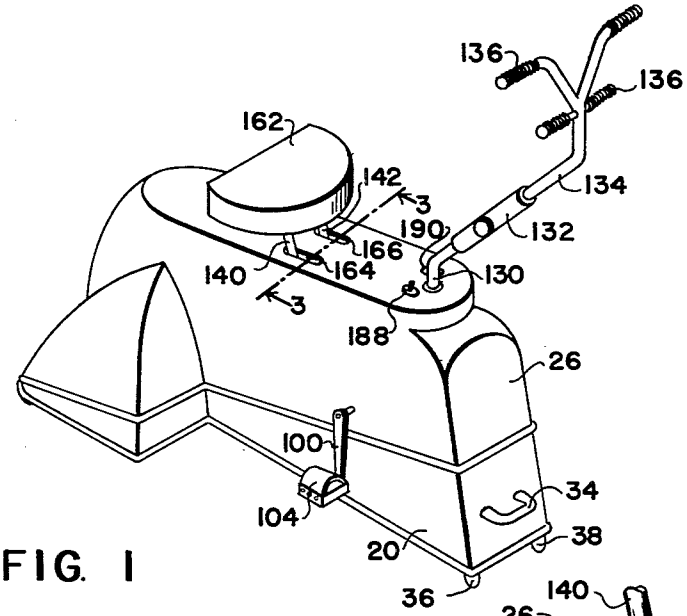

FIG. 1

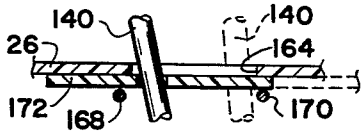

FIG. 5

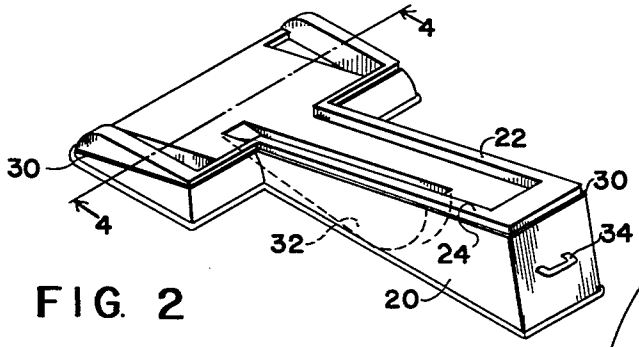

FIG. 2

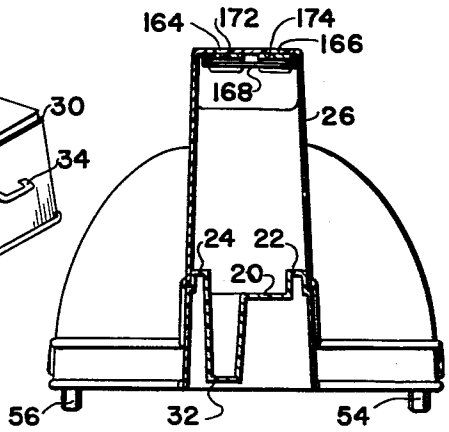

FIG. 3

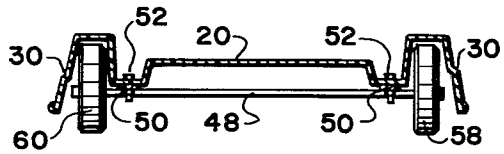

FIG. 4

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May 26, 1964 R. J. HARWOOD 3,134,378

EXERCISE MACHINE

Filed Oct. 10, 1960 6 Sheets-Sheet 2

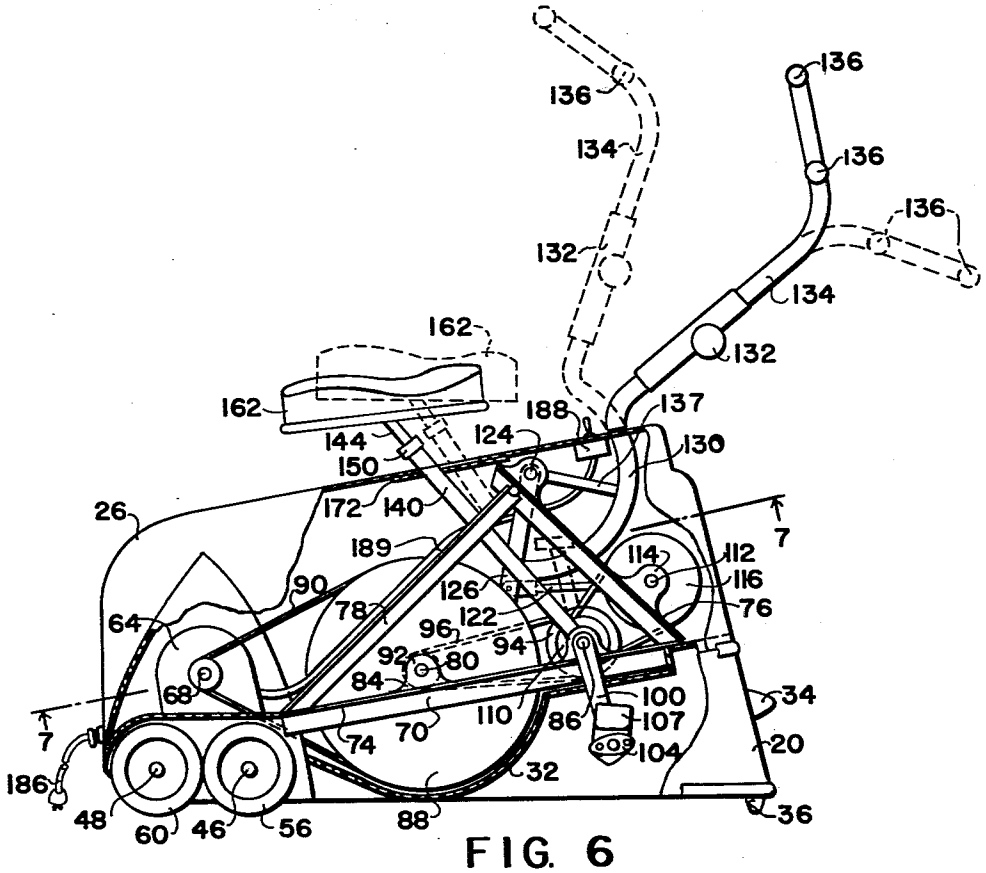

FIG. 6

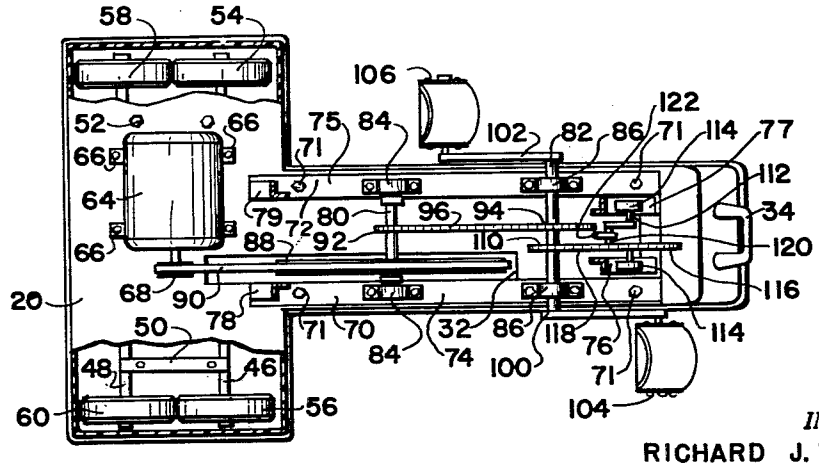

FIG. 7

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May 26, 1964 R. J. HARWOOD 3,134,378

EXERCISE MACHINE

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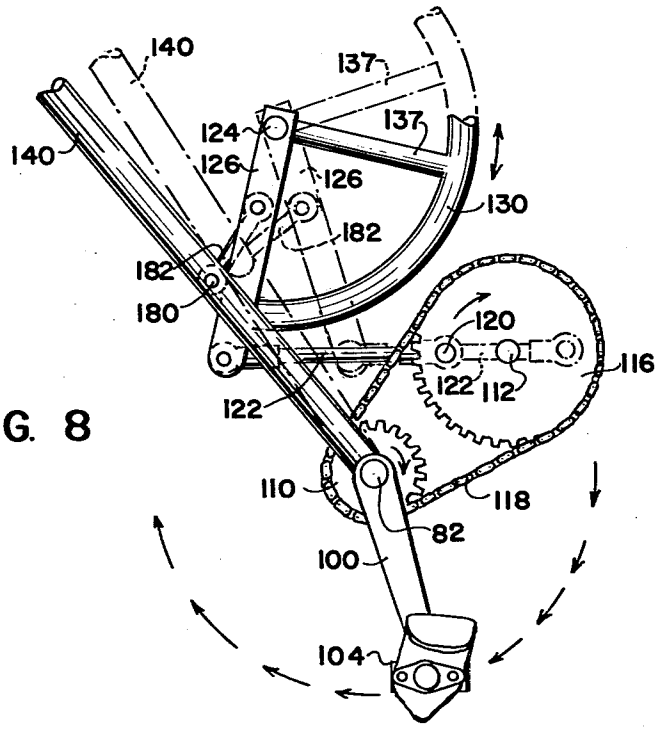

FIG. 8

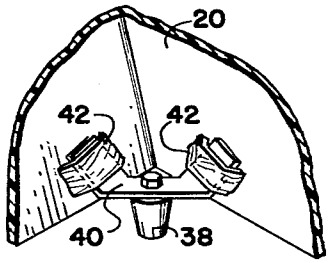

FIG. 9

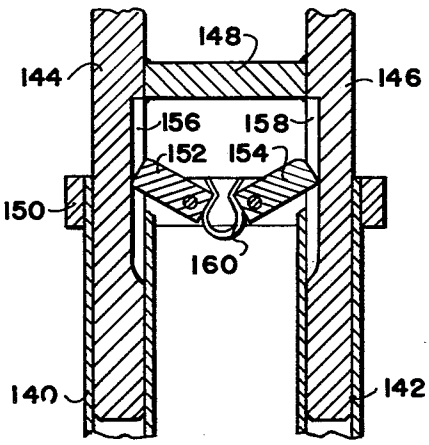

FIG. 16

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EXERCISE MACHINE

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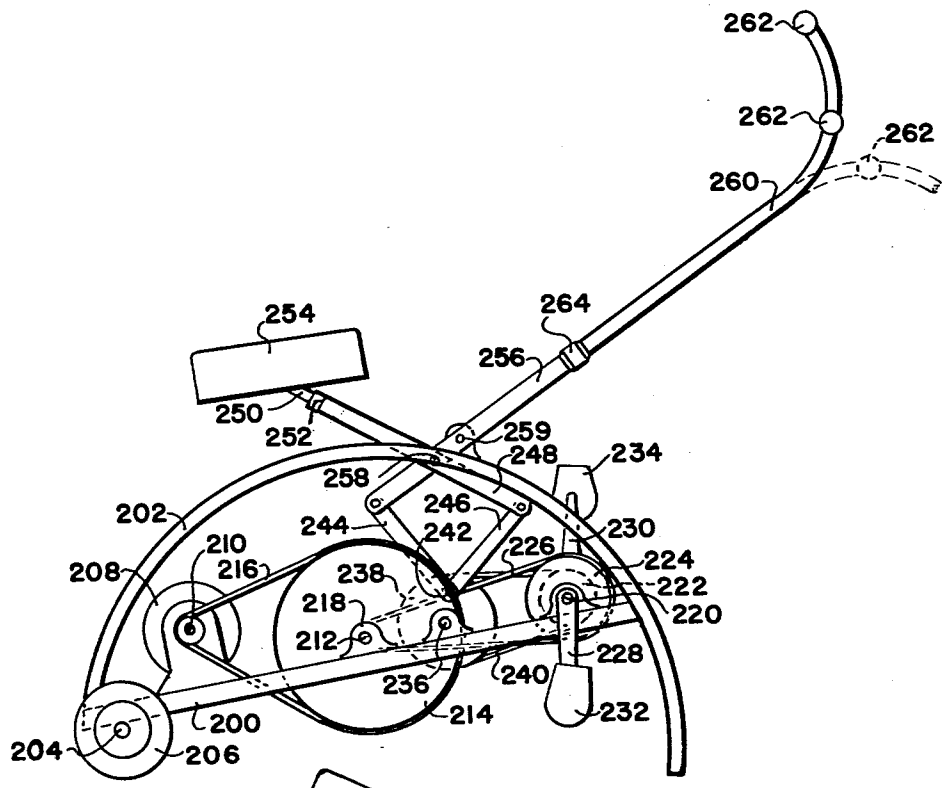

FIG. 10

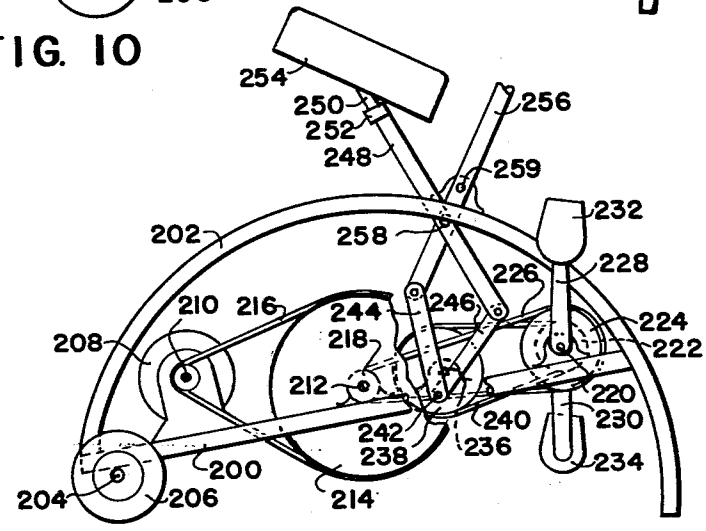

FIG. 11

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EXERCISE MACHINE

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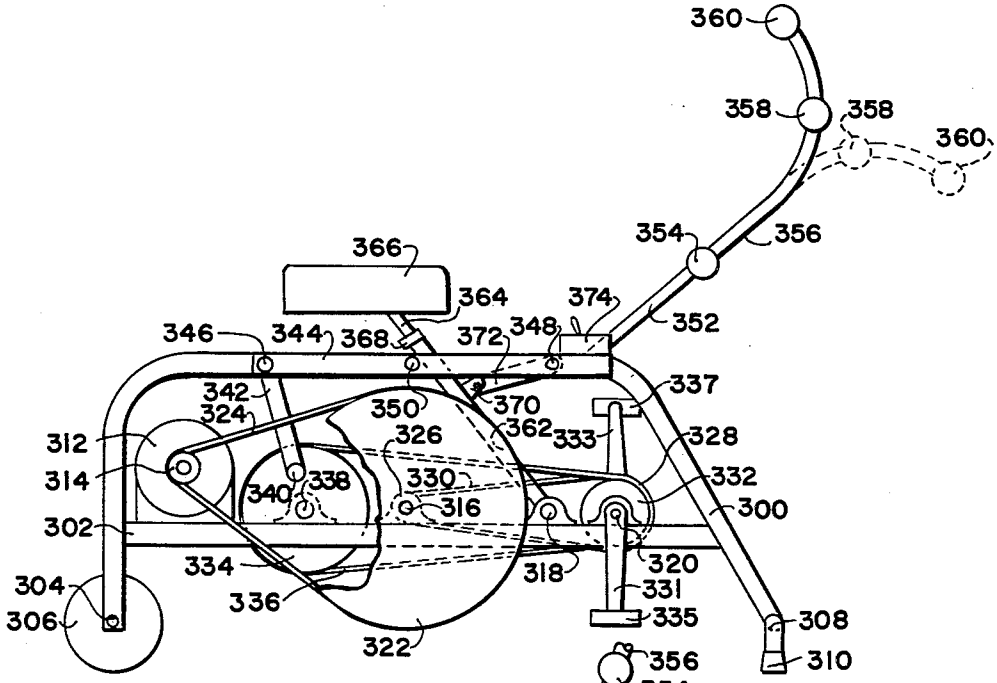

FIG. 12

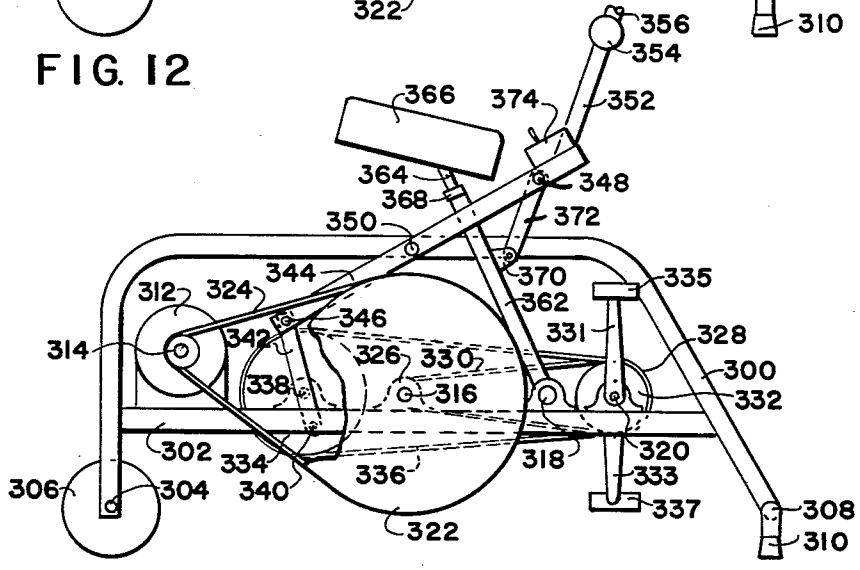

FIG. 13

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EXERCISE MACHINE

Filed Oct. 10, 1960 6 Sheets-Sheet 6

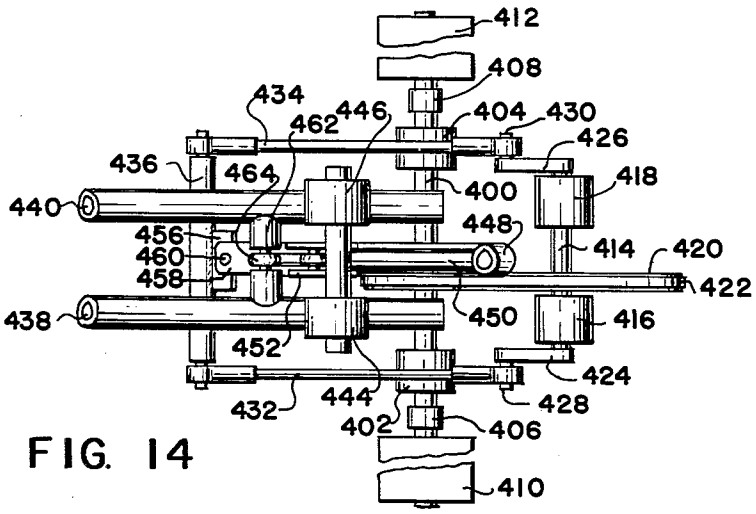

FIG. 14

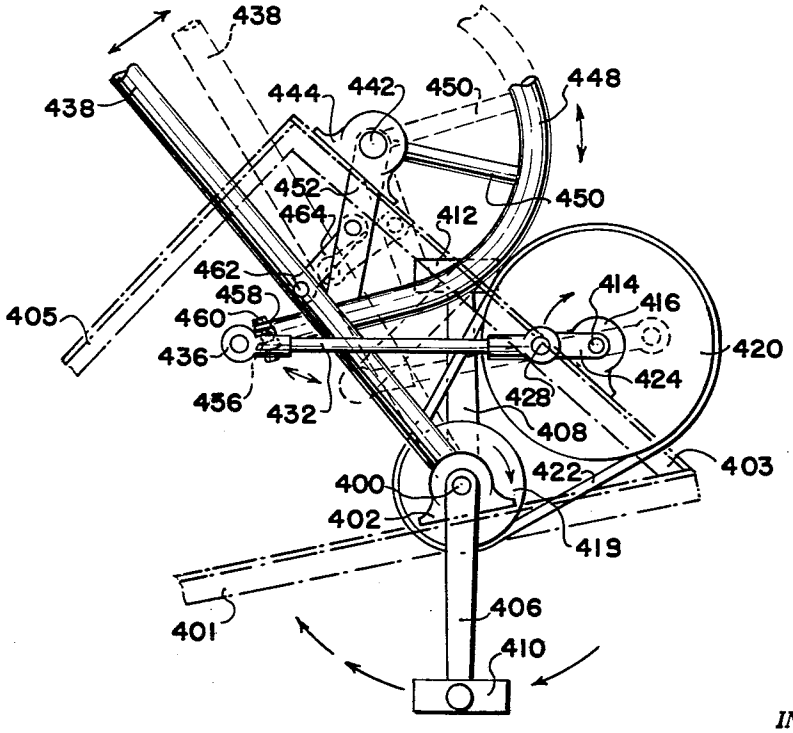

FIG. 15

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United States Patent Office 3,134,378
Patented May 26, 1964

3,134,378

EXERCISE MACHINE

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Filed Oct. 10, 1960, Ser. No. 61,746
14 Claims. (Cl. 128—25)

This invention relates to exercise machines. In a more specific aspect, this invention relates to bicycle type exercise machines having power means to drive pedals and oscillate handle bar and seat structures. In another aspect, the invention relates to means for driving the movable structure in an exercise device.

Various types of exercising machines, including the so-called bicycle type exerciser are known. The bicycle exercisers of the prior art utilize spring or other means as a counter-balance for the weight of the individual using the machine, and these means have been found to be unreliable in operation, such tending to lose their strength, thus reducing the effectiveness and efficiency of the bicycle exerciser. Also, prior art bicycle type exercisers have failed to provide suitable adjustable handle bar and seat supporting structures which are desirable for the device to be conveniently used by persons of different size and/or weight. Furthermore, the prior art devices do not provide means for positively preventing movement of the device on the supporting surface during operation, resulting in slippage and in some instances damage to the supporting surface which limits use of these devices in the ordinary home. The mechanical means for operating the prior art bicycle type exercisers are bulky, inefficient and unreliable. Also, the moving parts operating the exercising device are often not shielded or covered, thereby requiring care in use so as to prevent injury. Many of the prior art devices, particularly those having counter-balance means, cannot be operated unless driven by the power means since the force required to operate the device is greater than can be supplied by a human being. This limits the use of the device and requires excessively large and expensive power units.

In accordance with the present invention a new exerciser has been provided which overcomes the disadtages and deficiencies apparent in the prior art. The present bicycle type exerciser utilizes an improved mounting means which positively prevents undesirable movement of the device during operation. Also, the handle bar and seat structure are adjustable and variable within a wide range so that the device can comfortably be used by various individuals, regardless of size or weight. New and improved mechanical operating means are provided in each of several preferred embodiments which efficiently provides for the desirable interaction between the foot pedals and the seat and handle bar structures. The moving parts of the apparatus of the invention are preferably covered so that injury to the user due to movement of any of the apparatus is prevented. The present machine is constructed so that it can be operated without the power means, making it more versatile and eliminating the need for excessively large power means.

One preferred specific embodiment of the exerciser of the invention includes a base. The base is preferably supported by feet and/or wheels which are desirably constructed in such a manner as to prevent movement of the base during operation of the apparatus. Seat and handle bar structures are preferably constructed and mounted so as to be movable relative to each other and in relation to foot pedals. Power means are desirably provided and suitably mounted so as to drive the foot pedals, seat structure, and handle bars. Various mechanical means of my invention for driving the seat, foot pedals and handle bars are provided to obtain the desired results. The device is preferably covered with a housing which covers the working parts.

The mechanical means of the invention for driving an exerciser is preferably applied to an exerciser having a foot pedal crank assembly rotatably mounted on suitable frame means, and a handle bar post assembly and a seat post assembly carried by the frame means. In the drive means of my invention these assemblies are operatively connected thereby so that the seat post assembly and handle bar post assembly are moved when the foot pedal crank assembly is rotated. Preferably, this movement occurs whether the preferred electric powered means drives the foot pedal crank assembly or whether same is manually powered. In a specific preferred embodiment, a sprocket having an eccentrically mounted pin thereon is carried by the frame means and is driven by a sprocket on the foot pedal crank assembly. Linking means, such as a pitman, is carried by the pin to impart an oscillating movement to the seat and handle bar post assembly. In some of the preferred embodiments of the mechanical driving of the invention, a single pitman is used and the handle bar and seat post assemblies are interconnected by suitable linking means. In other specific embodiments of the invention, a plurality of pitmans are used to impart the motion to the seat and handle bar post assemblies. In one preferred specific embodiment of the mechanical drive means of the invention, two pitmans are preferably used to act in unison to impart the oscillating movement to the handle bar and seat post assemblies.

It is an object of this invention to provide a new exercise machine means.

Another object of the invention is to provide a new bicycle type exercise machine.

Another object of the invention is to provide a new bicycle type exercising machine having power means to move foot pedals, seat and handle bar structures.

Another object of the invention is to provide a new exercise machine which can be operated with or without the use of power means.

A further object of the invention is to provide new mechanical movements and means for driving the foot pedal and seat and handle bar structures in an exercising machine.

A still further object of the invention is to provide an exercising machine having new and improved mounting means.

Another object of the invention is to provide a new exercising machine having simplified driving means.

A further object of the invention is to provide a new exercise machine constructed so as to eliminate the need for counterbalancing apparatus.

A still further object of the invention is to provide a new construction for a bicycle type exercise machine which is relatively simple in operation and inexpensive to construct.

Another object of the invention is to provide a new exercise machine incorporating novel adjustable seat and handle bar structures.

Various other objects, advantages, and features of the invention will become apparent from the following description taken in connection with the accompanying drawings, in which:

FIG. 1 is an isometric view of one embodiment of the bicycle type exercising machine of the invention.

FIG. 2 is an isometric view of the base or lower portion of the housing of the device shown in FIG. 1.

FIG. 3 is a cross section view of the housing taken along the line 3—3 of FIG. 1.

FIG. 4 is a cross section view taken through the base portion of the housing along the line 4—4 of FIG. 2.

FIG. 5 is an enlarged cross section view showing a

preferred manner of receiving the seat posts for movement in the housing.

FIG. 6 is an enlarged side elevation view with the housing partially cut-away showing the operating means used in one embodiment of the invention and diagrammatically showing the movement of the seat and handle bar structure during operation.

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

FIG. 8 is an enlarged diagrammatic view of the foot pedal, seat and handle bar operation of the device shown in FIG. 6.

FIG. 9 is an enlarged inside isometric view of a preferred means of mounting the front leg support means.

FIGS. 10 and 11 are side elevation views of another preferred specific embodiment of the invention showing the structure in different operating positions.

FIGS. 12 and 13 are side elevation views of a still further preferred specific embodiment of the invention showing the structure in different operating positions.

FIG. 14 is an enlarged top plan view showing a modified structure for driving the seat and handle bar structure.

FIG. 15 is a diagrammatic view of the structure shown in FIG. 14 illustrating the movement of the seat and handle bar structure.

FIG. 16 is an enlarged view illustrating a preferred means of providing adjustment for the seat structure.

The following is a discussion and description of preferred specific embodiments of the new exerciser of the invention, and the new mechanical operating means of my invention, such being made with references to the drawings whereon the same reference numerals are used to indicate the same or similar parts and/or structure. It is to be understood that such discussion and description is not to unduly limit the scope of the invention.

Referring now to the embodiment of the invention shown in FIGS. 1–9, the bicycle type exercising machine of the invention includes an elongated base member **20** which is preferably somewhat wider at the rear end portion than at the forward end portion so as to form a generally T-shaped base member. Base member **20** is also preferably inclined upwardly from the rear end portion to the front end portion and has ledges **22** and **24** along the intermediate and forward end portions to receive and mount frame members described hereinafter. An upper housing **26** is desirably provided and is preferably contoured as to cover all of the working or moving parts of the exerciser to prevent the possibility of the user becoming injured by the moving parts. Housing **26** can be mounted on base **20** in any suitable manner, such as by providing a ridge **30** around the periphery of base **20** on which housing **26** will snugly fit. Base **20** and housing **26** can conveniently be formed of metallic or plastic materials and can be reinforced if desired to provide the required strength. A fiberglass reinforced plastic housing has been found desirable.

Base member **20** preferably has an elongated, generally arcuate recess **32** formed therein, preferably on one side thereof to receive the working parts as described hereinafter. A handle **34** is secured to the front end portion of base **20** so that the device can be lifted for movement.

Various types of mounting means can be provided to support the exerciser when in use. A preferred manner of mounting the front end of the base of the exerciser is by providing spaced feet **36** and **38** secured to opposite corners of the front portion of the base member **20**. FIG. 9 shows a desirable manner of mounting the feet **36** and **38** wherein foot **38** is bolted or otherwise secured to brace member **40** which in turn is secured to the corner of base **20** in any suitable manner, such as by glassing in as shown at **42**.

The rear end portion of base **20** is preferably mounted on wheels and in such a manner that the exercise machine can be moved when desired but will be prevented from moving during operation. A preferred manner of doing this is shown in FIGS. 4, 6 and 7. Two axles **46** and **48** are provided and are spaced by reinforcing and spacing members **50** which are rigidly secured to the axles, such as by welding. The members **50** are secured to the base **20** by mounting bolts **52** or the like. Wheels **54** and **56** are rotatably mounted on opposite ends of axle **46** and wheels **58** and **60** are mounted on opposite ends of axle **48**. Axles **46** and **48** are spaced relative to the sizes of the wheels so that the wheels on each axle are in tangential frictional contact with the wheels on the other axle and with the supporting surface. Thus, when the exercise machine is in operation any movement of the machine will be prevented due to the counter-rotating frictional engagement between the wheels and with the supporting surface. In order to move the device, it is merely necessary to raise base **20** by lifting handle **34** so that one set of wheels is out of contact with the supporting surface. This wheel mounting is also advantageous for use in moving the exercise machine on steps or the like where first one set of wheels and then the other will contact the steps, eliminating much of the bumping and the like usually necessary in order to move the machine up the steps. This wheel mounting means is shown and described more fully in the copending application Serial No. 58,414, filed September 26, 1960, and titled "Wheel Mounting Means," now Patent No. 3,096,852. While this means of mounting the base **20** has been found desirable, other means can be utilized if desired.

Suitable power means, such as electric motor **64**, is mounted on the rear end portion of the base **20** in any suitable manner, such as mounting bolts **66**. Motor **64** preferably is positioned between the wheels supporting the rear end of the device. Pulley **68** is mounted on the shaft of the electric motor **64**. Motor **64** preferably has two or more speeds, or the output can be varied by using a rheostat.

Two generally triangular shaped frame members **70** and **72** are rigidly mounted on ledges **24** and **22** respectively in any suitable manner, such as by mounting bolts **71**. Frame member **70** consists of a base portion **74**, a forward portion **76** and a rearward portion **78** and frame member **72** includes base portion **75**, forward portion **77** and rearward portion **79**. Frame memebers **70** and **72** are constructed to be the mirror images of each other and are in facing relation when mounted. Frame members **70** and **72** can be formed of common angle irons or other suitable materials secured together in any desirable manner. The frame members **70** and **72** are disposed in generally parallel planes when mounted.

Two shafts **80** and **82** are mounted for rotation on frame members **70** and **72** in any suitable manner, such as in pillow blocks **84** and **86** respectively. Shafts **80** and **82** extend between the base portion of frame members **70** and **72** and are generally parallel when mounted.

A pulley **88** is fixed to shaft **80** to turn therewith. Pulley **88** is disposed within recess **32** in base **20** and receives a V-belt **90** which is connected to pulley **68** on the electric motor **64** so that pulley **88** and shaft **80** are driven by the electric motor **64**.

Sprockets **92** and **94** are mounted on shaft **80** and **82** respectively for rotation therewith. Sprockets **92** and **94** are connected by a chain **96** so that when shaft **80** is rotated by pulley **88** shaft **82** will also be rotated through the chain drive and sprockets.

Crank arms **100** and **102** have one end portion thereof secured to opposite end portions of shaft **82** and are secured thereto so as to extend from shaft **82** one hundred and eighty degrees apart. Foot pedals **104** and **106** are secured to the other end portion of crank arms **100** and **102** respectively. Pedals **104** and **106** can be of the conventional bicycle type pedal, or they can be of the type shown in copending design application Serial No. 61,579, filed August 1, 1960, titled "Pedal or Similar Article," now Patent No. D. 191,091. The pedals **104** and **106** preferably have adjustable straps **107** which receive the foot of the user.

Another sprocket **110** is mounted on shaft **82** for ro-

tation therewith. A crank shaft 112 is rotatably mounted in pillow blocks 114 on the forward portion of frame members 70 and 72. Crank sprocket 116 is mounted on crank shaft 112 and is driven by a chain 118 between it and sprocket 110. Crank sprocket 16 has a crank pin 20 eccentrically mounted thereon which receives one end portion of a pitman 122. A pivot 124 is rotatably mounted on and extends between the upper end portion of the forward portions of the frame members 70 and 72. Pivot 124 receives one end of a lever 126. The other end portion of lever 126 is pivotally connected to the other end portion of pitman 122.

Handle bar support member 130 is rigidly secured to the outer end portion of lever 126 in any suitable manner, such as by welding. Handle bar support member 130 extends in an arcuate manner forwardly and upwardly to project out of a hole in housing 26. Spoke 137 can be provided to brace handle bar support member 130, and is rigidly secured to the handle bar support member 130 and to the pivot 124. A collar member 132 is rigidly secured to the outer end portion of handle bar support member 130 and telescopically receives handle bar 134. Handle bar 134 has handles 136 thereon and handle bar 134 can be rotated within collar 132 as shown in FIG. 6, so that the handles 136 can be moved toward or away from the user during operation. Handle bar 134 is preferably telescopically, rotatably and lockably secured within collar 132 in any suitable manner, such as shown in copending application entitled "Adjusting Means," Serial No. 61,453, filed October 10, 1960.

Two spaced and generally parallel seat post guide tubes 140 and 142 are rotatably secured in any suitable manner in one end portion to shaft 82 and extend upwardly and rearwardly therefrom between frame members 70 and 72 and on opposite sides of the lever 126 and handle bar support member 130. Seat posts 144 and 146 are received in seat post guide tubes 140 and 142 respectively. Seat posts 144 and 146 are separated by a lug reset bar 148 which extends between and is rigidly secured to both of the posts. Coacting means are provided on the seat posts 144 and 146 and seat post guide tubes 140 and 142 to lockably and adjustably position the seat posts within the tubes. A preferred manner of accomplishing this is set forth in detail in the copending application entitled, "Positioning Means for Seat Structures and the Like," Serial No. 48,035, filed August 8, 1960, and now Patent No. 3,113,793. This structure is shown in FIG. 16 and includes a base member 150 which receives seat post guide tubes 140 and 142. Lugs 152 and 154 are pivotally mounted on base member 150 so that one edge thereof can be in biting engagement with the post 144 and 146 respectively into which the edges of lugs 152 and 154 are received. A generally U-shaped leaf spring member 160 is loosely positioned between lugs 152 and 154 and urges the edges of the lugs into biting engagement with post 144 and 146 during normal locking action.

In order to adjust the posts 144 and 146 upwardly, it is merely necessary to lift the seat 162 to which the seat posts 144 and 146 are rigidly secured. Lugs 152 and 154 will permit upward movement of the seat posts. When the posts are urged downwardly the edges of lugs 152 and 154 will be in biting engagement with the posts, thus preventing downward movement. In order to readjust the seat to a lower position, the seat is first pulled to its outermost position at which time the lugs 152 and 154 will be engaged by the lower end of the grooves 156 and 158 respectively, causing them to be moved into a nearly vertical position where they will be held by the flat end portions of spring 160. The seat post 144 and 146 can then be lowered without engaging the lugs 152 and 154 until the lugs 152 and 154 are engaged by the lug reset bar 148, which moves the lugs outwardly into the grooves 156 and 158 whereupon the body portion of spring member 160 will once again urge them outwardly into biting contact with the seat posts 144 and 146, and the seat 162 can again be adjusted upwardly to any desired position merely by lifting on the seat. While the locking and positioning means for the seat structure 162 as described above is preferred, various other means of adjusting or positioning the seat can be used, if desired.

Since seat 162 will be moved during operation of the exerciser, it is preferred to provide a movable closure means with the housing 26 so that the operating portion of the device is never exposed and fingers, clothes and the like will not become caught in the operating mechanism. For this purpose, elongated slots 164 and 166 (FIGS. 1, 3 and 5) are provided to receive tubes 140 and 142 respectively. Two transversely extending rod guides 168 and 170 (FIG. 5) are secured to the underneath surface of the upper portion of the housing 26 and spaced therefrom. Plates 172 and 174, which can be formed of the same plastic material used to make housing 26, are apertured to receive the seat posts guide tubes 140 and 142 and are positioned between the top surface of the housing 26 and the guides 168 and 170 so that as the seat posts guide tubes 140 and 142 move longitudinally within the housing 26 during operation, the plates 172 and 174 will also be moved within guide 168 and 170 so that the inside of the device having the moving parts therein will never be exposed.

The exercise machine is preferably constructed so that the seat 162 moves in opposition to and in cooperation with the handle bar structure 134. One manner of accomplishing this is best seen in FIG. 8 and includes a pivot 180 which is secured to and extends between the seat post guide tubes 140 and 142. A connecting member 182 is pivotally connected to and joins the pivot 180 and the intermediate portion of lever 126 so that as lever 126 is moved by pitman 122 causing handle bar support member 130 to be moved, the seat post guide tubes 140 and 142 are also moved. FIG. 8 illustrates the various positions of the pitman 122, lever 126, handle bar support member 130, and seat post guide tubes 140 and 142 during a cycle of the device. Thus, as seen in FIGS. 6 and 8, as the sprocket 116 is rotated the seat 162 will be moved forward as the handle bars 134 are moved rearwardly, and as seat 162 is moved rearwardly handle bars 134 will be moved forwardly.

To use the device, plug 186 is connected to a suitable electric wall outlet and switch 188 on the top of housing 26, which is connected to motor 64 by cable 189, is turned to the on position which starts electric motor 64. Pulley 68 will then be rotated, causing pulley 88 to be turned, which in turn drives shaft 80 and 82. The rotation of shaft 82 turns pedals 104 and 106 and also turns sprocket 116. As sprocket 116 turns crank pin 120 thereon will be moved eccentrically around shaft 112 so that pitman 122 will oscillate longitudinally. Pitman 122 causes lever 126 to oscillate which moves handle bar support member 130 and handle bars 134 thereon as well as the seat structure 162 as hereinbefore described. When motor 64 has more than one speed or a rheostat or other suitable means is provided to vary the speed of rotation of the electric motor 64, switch 188 can be conveniently operated by the user to obtain the desired result. Timing means shown at 190 in FIG. 1, can also be provided to accurately control the length of time the machine is used, and can be a coin operated timing device, if desired.

In order to further vary the operation of the device, the seat 162 can be moved to a higher or lower position, which also moves the seat forwardly or rearwardly, and handle bar structure 134 can be moved so that handles 136 thereon are closer to or further away from the user, such as shown in the dotted lines in FIG. 6. Also, the user can grasp either the upper or lower handles 136 in use so as to vary the movement of his body during the cycle of the machine. Furthermore, since handle bar structure 134 is telescopically and adjustably mounted in collar 132, the handle bar structure can be moved inwardly or outwardly as desired.

When electric motor 64 is operating, the user expends a relatively small amount of energy. Since the machine utilizes no springs or weights for counter-balancing, the user can, if desired, turn motor 64 off and operate the machine by manually pumping foot pedals 104 and 106.

A further preferred specific embodiment of the exerciser and mechanical drive means of the invention is shown in FIGS. 10 and 11, wherein a modified drive and operating means are provided. In this embodiment, a generally horizontal base or frame member 200 is secured to an arcuate frame member 202. Duplicate frame members similar to members 200 and 202 are provided and are spaced therefrom in a parallel plane to provide a support frame work. Frame members 200 and 202 are supported at the rear end of the device by axle 204 having wheels 206 at each end thereof and at the front end thereof by the lower end of frame member 202 which act as the feet for the front end of the device. The front end portion of frame member 200 and/or 202 can be joined by suitable braces (not shown).

Electric motor 208 is mounted between the rear end portions of frame members 200 and has a pulley 210 mounted thereon. Shaft 212 is rotatably mounted between frame members 200 and has mounted thereon pulley 214 which is driven by V-belt 216 which passes over pulleys 210 and 214. Also mounted on shaft 212 for rotation thereon is sprocket 218.

Another shaft 220 is rotatably mounted between support members 200 and has mounted thereon for rotation therewith sprockets 222 and 224. Chain 226 connects and drives sprocket 224 with sprocket 218 on shaft 212. Pedal crank arms 228 and 230 are mounted on opposite ends of shaft 220 and extend therefrom 180 degrees apart. Pedals 232 and 234 are mounted on the outer ends of crank arms 228 and 230 respectively. Pedals 232 and 234 are preferably of the type shown in the before mentioned patent application, though other types can be used, if desired.

A crank shaft 236 is rotatably mounted on frame members 200, preferably between shafts 212 and 220, and has sprocket 238 secured thereto. Chain 240 connects sprockets 222 and 238. Crank pin 242 is eccentrically mounted on sprocket 238. The mounting and construction of sprocket 238 and crank pin 242 is similar to that shown and described above in connection with sprocket 116 and crank pin 120.

Crank pin 242 carries pitmans 244 and 246. The outer end portion of pitman 246 has two spaced seat post guide tubes 248 pivotally secured thereto, only one of which is shown in the drawings. A seat post 250 is received by each of the guide tubes 248 and suitable adjusting and locking means shown at 252 can be provided to position the seat posts 250 within tubes 248. The locking means 252 can be of any suitable construction, such as that shown in FIG. 16 of the drawings. A seat 254 is mounted on the outer end of seat posts 250 and preferably is contoured for the comfort of the user.

Pitman 244 has a handle bar support post 256 pivotally secured to the outer end thereof which extends forwardly and upwardly therefrom. Handle bar posts 256 passes between the two guide tubes 248 and is pivotally connected thereto as shown at 258. Pivot 259 is rotatably mounted on frame member 202 and is received by handle bar post 256. A handle bar 260 is provided and has handles 262 thereon, preferably two pair of such handles spaced along the handle bar 260. The handle bar 260 is preferably adjustably received by adjusting means 264 on handle bar support 256. Adjusting means 264 can be of any suitable type, such as that shown and described in connection with FIGS. 1–9 and described in the before mentioned copending application entitled "Adjusting Means," Serial No. 61,453, filed October 10, 1960. Handle bar 260 is preferably rotatable within post 256 so that handles 262 can be placed in the position shown in either the solid or the dotted lines in FIG. 10.

The entire device is preferably covered by a suitable housing, such as a fiberglass reinforced plastic cover member, and a switch (not shown) is conveniently mounted on the housing to operate electric motor 208 and regulate the driving speed of same. Timing means can also be included as in the previous embodiment so that the device can be operated a predetermined length of time.

In operation, the electric motor 208 is started which turns pulley 214 and rotates shaft 212. Sprocket 218 thereon will be turned, causing sprocket 224 and shaft 220 to be rotated, which drives pedals 232 and 234. As shaft 220 turns, crank sprocket 238 will be driven, causing crank pin 242 to be moved in an annular path coaxial with shaft 236. Pitmans 244 and 246 will thus be moved, causing seat post tubes 248 and handle bar support member 256 to be moved alternately from the position shown in FIG. 10 to that shown in FIG. 11. Here, as in the previous embodiment, the machine can be operated manually, if desired.

A still further preferred specific embodiment of the exerciser and mechanical means of this invention is shown in FIGS. 12 and 13. In this embodiment two spaced frame members 300, only one of which is shown in the drawings, are provided and the lower end portions thereof are connected by base frame member 302. The lower rear end portion of frame members 300 receive axle 304. Axle 304 has a wheel 306 rotatably mounted on each end thereof. In some instances, it will be desirable to provide wheels in tangential frictional engagement such as shown in FIG. 6 of the drawings. The lower front end portions of frame members 300 are rigidly secured to a bar 308 which extends across the front end of the bicycle type exerciser and has feet 310 thereon at either end thereof, preferably covered with rubber cup supports or the like to prevent movement and injury to the supporting surface. An electric motor 312 is mounted between the rear end portion of base frame members 302 and has a pulley 314 mounted on the drive shaft thereof. Three shafts 316, 318 and 320 are mounted on frame members 302 and are generally parallel to each other and in spaced relation. Each of the shafts can be rotatably mounted in any suitable manner, such as by the use of pillow blocks as shown in the drawings.

Shaft 316 mounts large pulley 322 for rotation therewith and V-belt 324 connects pulley 322 to pulley 314 on electric motor 312.

Shaft 316 also mounts a relatively small sprocket 326 which is connected to sprocket 328 mounted on shaft 320 by chain 330. Arms 331 and 333 are secured to the end portions of shaft 320 and mount pedals 335 and 337 respectively. A second sprocket 332 on shaft 320 is connected to crank plate 334 by a chain 336. Crank plate or sprocket 334 is suitably mounted between base frame members 302 on a crank shaft 338 which is rotatably mounted on base frame member 302 in any suitable manner, such as by the use of pillow blocks. A crank pin 340 is eccentrically mounted on one crank plate 334 and moves in an annular path about shaft 338. Pitman 342 is pivotally secured to crank pin 340 for movement therewith.

A handle bar support assembly 344 is provided which preferably includes two spaced bars or beams which are held in spaced relation by pivots 346 and 348 at opposite end portions of the assembly 344. Pivot 346 receives the other end of pitman 342 for movement therewith. A pivot member 350 passes through the beams of handle bar assembly 344 and pivotally mounts it between the central portions of frame members 300. Thus, as crank pin 340 moves in its path about crank shaft 338, pitman 342 will be moved therewith, causing handle bar beam assembly 344 to be oscillated about pivot 350 as shown in FIGS. 12 and 13. The handle bar beam assembly 344 has a tubular neck 352 rigidly secured thereto and extending upwardly therefrom on the forward end. Neck 352 preferably includes adjusting means 354 which re-

ceives and adjustably mounts handle bar 356. Handle bar 356 preferably has two sets of spaced handles 358 and 360 similar to those previously described, and preferably handle bar 356 can be rotated within the neck 352 so that the handles 358 and 360 can be positioned toward or away from the user as shown in the dotted lines in FIG. 12. The adjusting means 354 can be similar to that described in connection with FIGS. 1 and 6, or it can be simply an adjustable collar surrounding neck 352, which is split at its outer end so as to be compressed by the collar to tightly grip the handle bar 356.

A seat post guide tube 362 is mounted on shaft 318 to be movable thereon and extends upwardly and rearwardly therefrom and is positioned between the beams of handle bar assembly 344. Tube 362 receives a seat post 364 which mounts seat 366. Seat post 364 is preferably adjustably mounted within seat post tube 362 by adjusting means 368 of any suitable construction, such as that shown in FIG. 16 of the drawings which can easily be adapted for use with a single tube and post. In other instances, it will be desirable to provide the adjusting means 368 by merely spliting the upper end portion of the tube 362 and providing an adjustable collar thereabout which can be tightened when the seat post 364 is in the desired position.

Standard 370 is rigidly mounted on the intermediate portion of seat post tube 362 and extends outwardly therefrom. Connecting bar 372 is pivotally mounted at one end portion on standard 370 and is pivotally received at its other end portion by pivot 348 on handle bar assembly 344. Thus, the seat post guide tube 362 is connected to the handle bar assembly 344 for movement therewith as movement is imparted thereto by pitman 342 moving with crank pin 340.

The switch mechanism 374 for operating electric motor 312 is conveniently mounted on the forward portion of handle bar assembly 344, or it can be mounted on a housing (not shown). The switching mechanism preferably is such that electric motor 312 can be operated on any of its speeds, and timing mechanism can be provided as in previous embodiments described so that the user can ride the device for a predetermined time.

In operation, switch 374 is turned to the operating position which starts electric motor 312. Motion is imparted to pulley 322 by V-belt 324 and pulley 314. This motion is transmitted through shaft 316, sprocket 325 and chain 330 to sprocket 332 on shaft 320 to turn the sprockets thereon and rotates the pedals 335 and 337. Rotation of shaft 320 imparts movement to crank plate 334 and the crank pin 340 causing handle bar assembly 344 to oscillate about pivot 350. At the same time, the seat is moved with and in opposition to the handle bar assembly due to the connection of connecting bar 372 between the handle bar assembly 344 and the seat post guide tubes 362. Here, as in previously described embodiments, the seat and handle bar mechanisms can be adjusted relative to each other both outwardly and forwardly so that the device is readily usable by persons of varying physical dimensions, and the seat and handle bar can be positioned at varying distances apart for a progressive increase in the amount of exercise or toning of the muscles of the individual from day to day.

FIGS. 14 and 15 disclose a still further preferred specific embodiment of the mechanical means of the invention. The working parts shown in these two figures can be used in connection with any of the embodiments previously described, however such a construction has been found particularly desirable for use with the device as shown in FIGS. 1–9. FIG. 15 is similar to FIG. 8, and illustrates the difference between the two embodiments, therefore the supporting structure and the like shown in the first embodiment described would be the same or similar when using the mechanical movement illustrated in FIGS. 14 and 15.

A triangular frame consisting of members 401, 403, and 405 is preferably provided and is secured to a supporting base. Another frame (not shown) is disposed in a generally parallel plane and is the mirror image of the first mentioned frame. These frames can be formed of angle irons or other suitable materials.

A shaft 400 is rotatably mounted on the frame members 401 in any suitable manner, such as by the use of pillow blocks 402 and 404. Shaft 400 receives crank arms 406 and 408 at opposite ends thereof and extending therefrom 180 degrees apart. Pedals 410 and 412 are secured to the outer ends of crank arms 406 and 408 respectively. Pedals 410 and 412 can be of any suitable construction, such as that shown in my copending design patent application entitled "Pedal, or Similar Article," Serial No. 61,579, filed August 1, 1960, and now Design Patent No. D. 191,091.

Crank shaft 414 is mounted for rotation on the frame members 403 in any suitable manner, such as by the use of pillow blocks 416 and 418. Shaft 414 extends through these blocks. Shaft 400 has rigidly mounted thereon a sprocket 419 and crank shaft 414 has sprocket 420 thereon, the sprockets 419 and 420 being connected by a chain or belt 422 to drive crank shaft 414.

Crank shaft 414 extends through both of the pillow blocks 416 and 418 and arms 424 and 426 have one end portion thereof rigidly secured to the ends of shaft 414 for rotation therewith. Pins 428 and 430 are rigidly secured to the outer end portion of arms 424 and 426. Arms 424 and 426 preferably are aligned, that is they extend outwardly from shaft 414 in the same transverse plane. One end portion of a pitman 432 is received by pin 428 and one end portion of a like pitman 434 is received by pin 430. The other end portion of pitmans 432 and 434 receive the ends of a rod 436.

Two seat post guide tubes 438 and 440 are provided and are pivotally mounted on shaft 400 for oscillation thereon. Tubes 438 and 440 are generally parallel and receive seat posts (not shown), preferably so as to be adjustable therein. The seat post guide tubes, seat posts and the mounting therefor can be similar to those shown in FIGS. 1, 6 and 16.

A pivot 442 is mounted on the frame members 403 in any suitable manner, such as by pillow blocks 444 and 446. A handle bar support member 448 similar to handle bar support member 130 in the embodiment shown in FIGS. 1–9 is provided. Spokes 450 and 452 are provided and have the end portion thereof rigidly secured to handle bar support member 448 and pivot 442 so as to brace or reinforce the handle bar support member.

Rod 436 preferably has a short bar 456 rigidly secured thereto and projecting outwardly therefrom. Bar 456 can be secured to rod 436 in any suitable manner, such as by welding. The innermost end of handle bar support member 448 has a slot therein as shown at 458 and best seen in FIG. 15. The split end 458 of handle bar support 448 has a mounting pin or bolt 460 passing therethrough which also passes through bar 456 so as to mount handle bar support member 448 for movement with rod 436. This type of mounting is particularly desirable since it permits a certain amount of play or movement between handle bar support member 448 and rod 436, thereby reducing strain or stress on the members. Handle bar support 448 can be secured to rod 436 by other suitable means if desired.

A pivot 462 is positioned between seat post guide tubes 438 and 440 and a connecting member 464 is pivotally connected at its ends to lever 452 and pivot 462. The handle bar support member 448 and seat post guide tubes 438 and 440 are thus connected together for simultaneous movement in opposition during use of the machine.

In operation, shaft 400 is driven in any suitable manner, such as directly from a power source, through intermediate reduction gearing such as shown in the previous embodiments, or by the user manually turning the pedals. As shaft 400 is turned, pedals 410 and 412 will be driven

and sprockets 419 and 420 will be rotated, turning crank pins 428 and 430 in an annular path about shaft 414. Pitmans 432 and 434 will thus be driven, moving rod 436 in a reciprocating manner. As rod 436 is moved the handle bar support member 448 will likewise be moved, causing the handle bars secured thereto to be operated in a fashion similar to that illustrated in FIG. 6. The seat post guide tubes 438 and 440 will likewise be driven through the linkage 464 and 462 and the seat (not shown) will be moved in opposition to the handle bar structure.

The embodiment last described permits the operating mechanism to be constructed in a somewhat smaller or compact space due to the fact that smaller clearances are required. Also, the use of the two pitmans 432 and 434 reduces the size and strength of materials needed due to the duplicate driving system, and the preferred manner of mounting handle bar support member 448 on rod 436 permits some lateral play in the device without inducing unnecessary stresses to the parts, tending to cause premature failure of the driving mechanism.

It will be seen from the foregoing description of the various embodiments described that the bicycle type exercisers of the invention are relatively simple in operation as compared to prior art devices, and improved drive means are disclosed in the various embodiments which reduce construction costs and result in improved efficiencies and movements.

Also, in each instance the framework and all the moving power driven parts except for the handle bars, the seat and the foot pedals can be enclosed within suitable housings, preferably made of light weight plastic materials, which reduces the possibility of injury by the user by inadvertently catching the limbs or clothing within the moving parts. Such a housing and construction not only provides these safety features, but as a result of this the necessary manufacturers liability insurance and the like can be substantially reduced, resulting in still further cost savings. Also, each of the embodiments can be manually operated since the usual counter balancing structure has been eliminated.

While the invention has been described in connection with specific embodiments, it will be evident to those skilled in the art that various modifications of this invention can be made or followed in the light of this description and discussion, without departing from the spirit of the disclosure or the scope of the claims.

I claim:

1. An exercise machine comprising, in combination, an elongated T-shaped base member integrally formed of plastic material and wider at the rear end portion than in the intermediate and forward end portions, said base member having a generally arcuate longitudinal recess formed therein intermediate the ends thereof, spaced rubber feet attached to and supporting the front end of said base member, contacting counterrotating and locking wheels oppositely mounted on parallel axels mounted on said rear end portion of said base member and supporting the rear end of said base, two generally triangular frame members, said frame members being secured to said base member on opposite sides thereof to be disposed in mirror image relation and generally parallel planes, pillow blocks on the base portions of said frame members, two shafts rotatably mounted on said pillow blocks and extending between said base portions of said frame members, said shafts being generally parallel and spaced from each other, the rear one of said shafts having a pulley mounted thereon to turn therewith and extending into said arcuate recess in said base member, an electric motor mounted on said base member at the rear end portion thereof, a V-belt connecting the electric motor pulley and said first-named pulley to rotate same and said rear one of said shafts, sprockets mounted on said shafts to turn therewith, said sprockets being connected by a chain to drive said front one of said shafts when said rear one of said shafts is rotated by said pulley, crank arms secured in one end portion to opposite end portions of the front one of said shafts, said crank arms extending from said shaft 180 degrees apart, a foot pedal secured to the other end portion of each of said crank arms, another sprocket mounted on said front one of said shafts, pillow blocks on the forward portion of said frame members, a crank shaft rotatably mounted on said last-named pillow blocks and extending therebetween, a sprocket mounted on said crank shaft for rotation therewith, a second chain connecting said another sprocket on said front one of said shafts with said sprocket on said crank shaft, a crank pin eccentrically mounted on said sprocket on said crank shaft, a pitman, said pitman having one end portion thereof secured to said crank pin, a pivot secured to and extending between the upper end portion of the forward portion of said frame members, a lever, said lever having one end portion rotatably received by said pivot and having the other end portion thereof pivotally joined to the other end portion of said pitman, a handle bar support having an outer collar member, said handle bar support being secured to the outer end portion of said lever and projecting forwardly and upwardly therefrom, a handle bar telescopically, rotatably and lockably secured in said collar member of said handle bar support, a spoke extending between said handle bar support and said pivot to brace said handle bar support, two spaced and parallel seat post guide tubes, said tubes being rotatably secured in one end portion to said front one of said shafts and extending upwardly and rearwardly therefrom between said frame members and on opposite sides of said lever and said handle bar support, a pivot mounted between said seat post tubes, a connecting member joining said last-named pivot and the intermediate portion of said lever so that as said lever moves with said crank shaft pin said seat post guide tubes will be pivoted, two seat posts, each of said seat post guide tubes receiving one of said seat posts, a seat rigidly secured to the outer end portions of said seat posts, and coacting means on said seat posts and said tubes to lockably adjust the position of said seat posts in said tubes, said device being constructed and adapted so that when said electric motor is in operation said first-named pulley will be rotated, thereby turning said rear and front shafts causing said cranks and pedals on said front shaft to be rotated about said shaft, and said crank shaft will be rotated, thereby causing said lever to oscillate about said pivot so that said handle bars and said seat are moved forwardly and rearwardly and upwardly and downwardly.

2. An exercise machine comprising, in combination, an elongated T-shaped base member, said base member having a recess formed therein intermediate the ends thereof, feet attached to and supporting the front end of said base, contacting counterrotating and locking wheels mounted on parallel axles at the rear end of said base and supporting the rear end of said base, two generally triangular frame members, said frame members being secured to said base in generally parallel planes, two spaced shafts rotatably mounted on the base portion of said frame members, a pulley mounted on the rear one of said shafts to turn therewith, said pulley being positioned in said recess in said base member, an electric motor mounted on said base member to drive said pulley and rotate said rear one of said shafts, each of said shafts having a sprocket mounted thereon to turn therewith, said sprockets being connected by a chain to drive said front one of said shafts when said rear one of said shafts is rotated, crank arms secured to the front one of said shafts, a foot pedal secured to each of said crank arms to turn therewith, another sprocket mounted on said front one of said shafts, a crank shaft rotatably mounted on said frame members and extending therebetween, a sprocket mounted on said crank shaft for rotation therewith, a crank pin eccentrically mounted on said last-named sprocket, a pitman, said pitman having one end portion thereof secured to said crank pin, a pivot mounted on said frame mem-

bers, a lever, said lever having one end portion mounted on said pivot and having the other end portion thereof pivotally joined to the other end portion of said pitman, a handle bar support secured in one end portion to said lever, a handle bar adjustably mounted in said handle bar support, two spaced seat post guide tubes, said guide tubes being rotatably mounted in one end portion on said front one of said shafts, connecting means joining said seat post guide tubes and said lever so that said tubes move with said lever in operation, each of said seat post guide tubes receiving a seat post, a seat rigidly secured to the outer end portion of said seat posts, said device being constructed and adapted so that said electric motor drives said pulley and rotates said shafts, turning said pedals and causing said handle bar and said seat to be moved with said lever.

3. An exercise machine comprising, in combination, a base member, two spaced frame members mounted on said base member in generally parallel planes, shafts rotatably mounted on said frame members, speed reduction gearing carried by said shafts, an electric motor mounted on said base, said electric motor being operatively connected to said speed reduction gearing to drive same, foot pedals connected to one of said shafts for rotation therewith, a crank shaft mounted on said frame members, an eccentrically mounted crank pin carried by said crank shaft, a pitman secured in one end portion to said pin, drive means connecting said crank shaft with said reduction gearing so that said crank shaft and said crank pin are thereby rotated, a lever pivotally mounted in one end portion on said frame members, the other end portion of said lever being operatively connected to the other end portion of said pitman so that said lever is oscillated by said pitman in operation, a handle bar support member secured to said lever, and a handle bar mounted on said handle bar support member, seat post guide tubes, connecting means operatively connecting said seat post guide tubes and said lever, seat posts received by said seat post guide tubes, said seat posts having a seat secured thereto, said handle bar support member and said seat posts being positioned to one side of said pin and operatively connected to said lever to move in opposition, said device being constructed and adapted so that when said motor is in operation said shafts and said crank pin will be rotated, causing said pedals to be rotated and said seat and said handle bar to be moved.

4. A bicycle type exercising machine comprising, in combination, spaced elongated base frame members, said frame members being generally parallel to each other, and spaced elongated generally arcuate frame members, said last-named members being secured to opposite ends of said first-named frame members, one end of said arcuate frame members extending beyond said base frame members to provide feet to support the front end of said machine, the other end portion of said base frame members being mounted on an axle, wheels mounted on the outer end portions of said axle, two shafts rotatably mounted on said base frame members and extending therebetween, said shafts being generally parallel and spaced from each other, the rear one of said shafts having a large pulley mounted thereon to turn therewith, an electric motor mounted on said base frame members at the rear end portion thereof, a V-belt connecting the electric motor pulley and said first-named pulley to rotate same and said rear one of said shafts, sprockets mounted on said shafts to turn therewith, said sprockets being connected by a chain to drive said front one of said shafts when said rear one of said shafts is rotated by said pulley, crank arms secured in one end portion to opposite end portions of the front one of said shafts, said crank arm extending from said shaft 180 degrees apart, a foot pedal secured to the outer end portion of each of said crank arms, another sprocket mounted on said front one of said shafts, a crank shaft rotatably mounted on said base frame members and extending therebetween, said crank shaft being disposed between said shafts, a sprocket mounted on said crank shaft for rotation therewith, a second chain connecting said another sprocket on said front one of said shafts with said sprocket on said crank shaft, a crank pin eccentrically mounted on said sprocket, two pitmans, each of said pitmans having one end portion thereof pivotally secured to said crank pin for movement therewith, a pivot rotatably secured to and extending between said arcuate frame members at the center portion thereof, a handle bar support received by said pivot, said pivot passing through the intermediate portion of said handle bar support, and a handle bar telescopically, rotatably and adjustably received by the outer end portion of said handle bar support, the inner end portion of said handle bar support being pivotally connected to the other end portion of one of said pitmans, and two seat post guide tubes, said tubes being pivotally connected at their inner end portion to the other end portion of the other of said pitmans, the intermediate portions of said seat post guide tubes being pivotally connected to said handle bar support between said pivot and said one of said pitmans, each of said seat post guide tubes receiving a seat post, a seat rigidly secured to said seat posts, and means with said seat post guide tubes to adjustably position said seat post therein, said device being constructed and adapted so that when said electric motor is in operation said shafts will be rotated and said pedals driven, and said pitmans will be moved with said crank pin causing said handle bar and said seat to be moved in opposition toward and away from each other.

5. A bicycle type exercise machine comprising, in combination, a frame, said frame including a base portion and upper arcuately extending portion, an electric motor mounted on said base portion, two shafts rotatably mounted on said base portion of said frame, said shafts having gear reduction means thereon operatively connected to said electric motor, foot pedals operatively connected to one of said shafts for rotation therewith, a crank shaft rotatably mounted on the base portion of said frame, said crank shaft being operatively connected to said speed reduction gearing to be rotated when said electric motor is in operation, a crank pin carried by said crank shaft for rotation about said crank shaft, a handle bar structure pivotally mounted in an intermediate portion on the upper portion of said frame, seat post guide tubes pivotally connected in an intermediate portion to said handle bar structure, each of said seat post guide tubes receiving and mounting a seat post, a seat secured to said seat posts, and two pitmans, one end portion of each of said pitmans being pivotally connected to said crank pin for rotation therewith, the other end portion of one of said pitmans being connected to the inner end portion of said handle bar structure and the other end portion of the other of said pitmans being pivotally connected to the inner end portion of said seat post guide tubes, said device being constructed and adapted so that said pedals and said crank shaft are rotated by said electric motor acting through said speed reduction gearing, and said handle bar structure and said seat will be caused to move toward and away from each other as said crank pin rotates about said crank shaft.

6. A bicycle type exercising machine comprising, in combination, elongated, spaced and generally parallel base frame members, spaced upper frame members having depending integral leg portions, the end portions of said base frame members being rigidly secured to said leg portions of said upper frame members, an axle extending between and rotatably secured to the leg portions of said upper frame members at the rear end thereof, wheels rotatably mounted on opposite ends of said axles, spaced feet secured to said leg portions of said upper frame members at the front end thereof, three shafts rotatably mounted on said base, said shafts being generally parallel and spaced from each other, the rear one of said shafts having a large pulley mounted thereon to turn therewith, an electric motor mounted on said base at the rear end portion thereof, a V-belt connecting the electric motor pulley

and said first named pulley to rotate same and said rear one of said shafts, sprockets mounted on said rear one of said shafts and the front one of said shafts to turn therewith, said sprockets being connected by a chain to drive said front one of said shafts when said rear one of said shafts is rotated by said pulley, crank arms secured in one end portion to opposite end portions of said front one of said shafts, said crank arms extending from said front one of said shafts 180 degrees apart, a foot pedal secured to the other end portions of each of said crank arms, another sprocket mounted on said front one of said shafts, pillow blocks on said base between said electric motor and said rear one of said shafts, a crankshaft rotatably mounted on said pillow blocks, a sprocket mounted on said crank shaft, a chain connecting said another sprocket on said front one of said shafts with said sprocket on said crank shaft, a crank pin eccentrically mounted on said sprocket on said crank shaft, a pitman, said pitman having one end portion thereof pivotally secured to said crank pin, a pivot secured to and extending between the intermediate portion of said upper frame members, a handle bar support assembly, said handle bar support assembly including two spaced and generally parallel bars, said bars being joined at opposite ends thereof by pivots rigidly secured to said bars, the intermediate portions of said bars being received by said first-named pivot, a tubular neck secured to said handle bar assembly and extending upwardly therefrom, the other end portion of said pitman being pivotally connected to the rear one of said pivots on said handle bar assembly, a handle bar telescopically, rotatably and lockably secured in said neck on said handle bar assembly, a seat post guide tube, said guide tube being rotatably secured to the intermediate one of said shafts on said base frame members, said guide tube extending between said bars of said handle bar support between said front one of said pivots and said first-named pivot, a seat post adjustably and lockably received in said seat post guide tube, a seat rigidly secured to the upper end of said seat post, a linking member, said linking member being pivotally secured at its end portions to said handle bar assembly and said seat post guide tube, said device constructed and adapted so that said electric motor can rotate said pulley causing said sprockets to be turned, driving said pedals and rotating said crank shaft, thereby driving said crank pin and moving said pitman and said handle bar support assembly about said first-named pivot, causing said handle bars and said seat to be moved in opposition toward and away from each other.

7. A bicycle type exercising machine comprising, in combination, spaced elongated base frame members, spaced upper frame members having depending leg portions, an electric motor mounted on said base frame members, a plurality of shafts rotatably mounted on said base frame members, said shafts being generally parallel and spaced from each other, speed reduction gearing mounted on said shafts for rotation therewith, said gearing being operatively connected to the pulley of said electric motor to be driven by said electric motor, pedals carried by one of said shafts for rotation therewith, a crank shaft rotatably mounted on said base and spaced from said first-mentioned shafts, an eccentrically mounted crank pin carried by said crank shaft, a pitman, said pitman having one end portion thereof rotatably secured to said crank pin, a pivot mounted on the intermediate portion of said upper frame members, a handle bar assembly, including spaced and generally parallel bars, an intermediate portion of said assembly being pivotally received by said pivot, each end of said handle bar assembly having a pivot thereon, the other end portion of said pitman being pivotally connected to said pivot on the rear end portion of said handle bar assembly, a handle bar adjustably secured to the front end portion of said handle bar assembly, a seat post guide tube pivotally mounted on one of said first-mentioned shafts, a seat post telescopically received by said seat post guide tube and adjustably secured therein, a seat rigidly secured to the outer end portion of said seat post, and a linking member having its end portions pivotally connected to the intermediate portion of said seat post guide tube and to the front one of said pivots on said handle bar assembly, said device being constructed and adapted so that said electric motor rotates said shafts through said speed reduction gearing and drives said pedals, and said crank pin moves in an eccentric path about said crank shaft, causing said seat post assembly to be rotated about said first-named pivot thereby moving said seat and said handle bar toward and away from each other.

8. A bicycle type exercise machine comprising, in combination, a base member, power means mounted on said base member, two generally triangular frame members, said frame members being secured to said base to be disposed in mirror image relation and generally parallel planes, a shaft rotatably mounted on the base portion of said frame members and extending therebetween, speed reduction gearing mounted on said frame members and operatively connected to said electric motor and said shaft, a sprocket mounted on said shaft for rotation therewith, crank arms secured in one end portion to opposite end portions of said shaft, said crank arms extending from said shaft 180 degrees apart, a foot pedal secured to the other end portion of each of said crank arms, a crank shaft rotatably mounted on the forward portion of said frame members and extending therebetween, a sprocket mounted on said crank shaft for rotation therewith, a chain connecting said sprocket on said shaft with said sprocket on said crank shaft, arms rigidly mounted in one end portion on opposite end portions of said crank shaft and extending therefrom in the same direction, a pin secured to the outer end portion of each of said arms, two pitmans, each of said pins receiving one end portion of said pitmans, a bar extending between and pivotally receiving the other end portions of each of said pitmans, a pivot secured to and extending between the upper end portion of the forward portion of said frame members, a lever, said lever having one end portion secured to said pivot for rotation therewith, a handle bar support, said handle bar support being secured to the other end portion of said lever and projecting forwardly and upwardly therefrom and extending rearwardly from said lever to be operatively connected to the intermediate portion of said bar, a handle bar telescopically, rotatably and lockably secured in said handle bar support, two spaced and parallel seat post guide tubes, said tubes being rotatably secured in one end portion to said shaft and extending upwardly and rearwardly therefrom between said pitmans and on opposite sides of said handle bar support member, a pivot mounted on and extending between said seat post guide tubes, a connecting member joining said last-named pivot and the intermediate portion of said lever, two seat posts, each of said seat post guide tubes receiving one of said seat posts, a seat rigidly secured to the outer end portion of said seat posts, and coacting means on said seat posts and said tubes to lockably adjust the position of said seat posts in said tubes, said device being constructed and adapted so that said electric motor drives said shaft and said crank shaft through said speed reduction gearing, thereby driving said pedals and turning said crank pin, causing said handle bar support and handle bars to be oscillated about said first-named pivot and causing said seat to be moved in opposition to said handle bars.

9. An exercise machine comprising, in combination, a base, power means mounted on said base, two frame members mounted on said base, said frame members being secured to said base in generally parallel planes, a shaft mounted on said frame members, speed reduction gearing mounted on said frame members and operatively connected to said power means and said shaft to rotate said shaft when said power means is in operation, foot pedals carried by said shaft and rotatable therewith, a second shaft mounted on said frame members, a sprocket mounted on said second shaft, said sprocket being rotated

by connecting means joining said sprocket and said speed reduction gearing, arms secured in one end portion to opposite end portions of said second shaft, the other end portion of each of said arms having a pin rigidly secured thereto, two pitmans secured in one end portion to said pins for movement therewith, a rod secured to and extending between the other end portion of said pitmans, a pivot mounted on said frame members, a handle bar assembly, said handle bar assembly being operatively connected to said pivot and secured to said rod, seat support members pivotally mounted on said first-named shaft, linking members connecting the intermediate portion of said seat support members and said handle bar assembly, a seat carried by said seat support members, said device being constructed and adapted so that said power means rotates said pedals and said second shaft, causing said handle bar structure and said seat to be moved in opposition.

10. An exercise machine comprising, in combination, a base, frame means mounted on said base, power means mounted on said base, a shaft mounted on said frame means, foot pedals carried by said shaft, speed reduction gearing carried by said frame means and operatively connected to said power means and said shaft, a crank shaft mounted on said frame means, crank pins eccentrically mounted on opposite ends of said crank shaft, pitmans secured in one end portion to said crank pins and extending therefrom in the same direction, a bar extending between and secured to the other end portion of said pitmans, a pivot rotatably secured to said frame means, a handle bar assembly operatively connected to said pivot and to said bar for movement therewith, a seat assembly pivotally mounted on said shaft, and linking means connecting said handle bar assembly and said seat assembly so that when said power means drives said pedals and said crank shaft said handle bar assembly and said seat assembly will be moved.

11. An exerciser comprising, in combination, a base member, two spaced axles carried by said base member, contacting and counter-rotating and locking wheels mounted on said axles, power means mounted on said base member, speed reduction gearing carried by said base member and operatively connected to said power means, a foot pedal assembly, said foot pedal assembly being operatively connected to and driven by said speed reduction gearing, a seat assembly movably mounted on said base member, a handle bar assembly operatively connected to said seat assembly for movement therewith in opposition thereto, and connecting members between said speed reduction gearing and said seat assembly and said handle bar assembly to move said seat assembly and said handle bar assembly in operation.

12. Driving means for an exercise machine having a frame, and foot pedal crank arms, a seat post and a handle bar post carried by said frame comprising, in combination, shafts rotatably mounted on said frame, each of said shafts having a sprocket mounted thereon to turn therewith, said sprockets being operatively connected to drive said shafts, said foot pedal crank arms being secured to one of said shafts, a crank pin eccentrically mounted on said sprocket on another of said shafts, a pitman, said pitman having one end portion secured to said crank pin, a pivot mounted on said frame, a lever, said lever having one end portion mounted on said pivot and having the other end portion pivotally joined to the other end portion of said pitman, said lever being secured to one end portion of said handle bar post, said one of said shafts having means to pivotally receive said seat post, connecting means joined to said lever and joined to said seat posts so that said seat posts will move with said lever in operation and in opposition to said handle bar post, and said driving means being constructed and adapted so that when mounted on said frame and said crank arms are turned said handle bar and said seat posts are moved with said lever.

13. Driving means for an exercise machine having a frame, and foot pedal crank arms, seat posts and a handle bar post mounted on said frame comprising, in combination, shafts rotatably mounted on said frame, said shafts having sprockets mounted thereon to turn therewith, said sprockets being operatively connected to drive said shafts, said foot pedal crank arms being secured to one of said shafts, a crank pin eccentrically mounted on said sprocket on another of said shafts, two pitmans, one end portion of each of said pitmans being secured to said crank pin for rotation therewith, the other end portion of one of said pitmans being connected to the inner end portion of said handle bar structure and the other end portion of the other of said pitmans being pivotally connected to the inner end portion of said seat posts, an intermediate portion of said seat posts being pivotally connected to an intermediate portion of said handle bar post with said seat posts and said handle bar post being moved in opposition when said shafts are driven, said driving means being constructed and adapted so that when mounted on said frame and said crank arms are turned said handle bar and said seat posts are moved.

14. Driving means for an exercise machine having a frame, and foot pedal crank arms, seat posts and a handle bar post carried by said frame comprising, in combination, two shafts rotatably mounted on said frame, sprockets mounted on said shafts to turn therewith, said sprockets being connected to drive said shafts, said foot pedal crank arms being secured to one of said shafts, arms secured in one end portion to opposite end portions of the other of said shafts, the other end portion of each of said arms having a pin rigidly secured thereto, two pitmans, said pitmans being secured in one end portion to said pins for movement therewith and extending in the same direction therefrom, a rod secured to and extending between the other end portion of said pitmans, a pivot mounted on said frame, a lever, said lever having one end portion mounted on said pivot and having the other end portion secured to the inner end portion of said handle bar post, said inner end portion of said handle bar post being secured to the intermediate portion of said rod, said one of said shafts pivotally mounting said seat posts, and connecting means joined to said lever and joined to said seat posts so that said seat posts will move with said lever in operation, said driving means being constructed and adapted so that when mounted on said frame and said crank arms are turned said handle bar and said seat posts are moved with said lever.

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