Feb. 14, 1950 B. BECKER 2,497,391

MECHANICAL SWIMMING EXERCISING MACHINE

Filed June 28, 1945 3 Sheets-Sheet 1

FIG. 1.

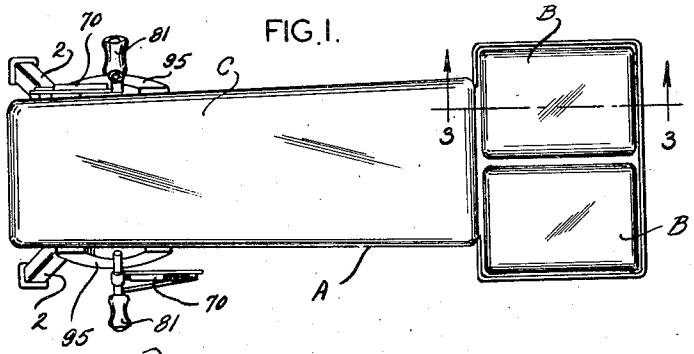


FIG. 2.

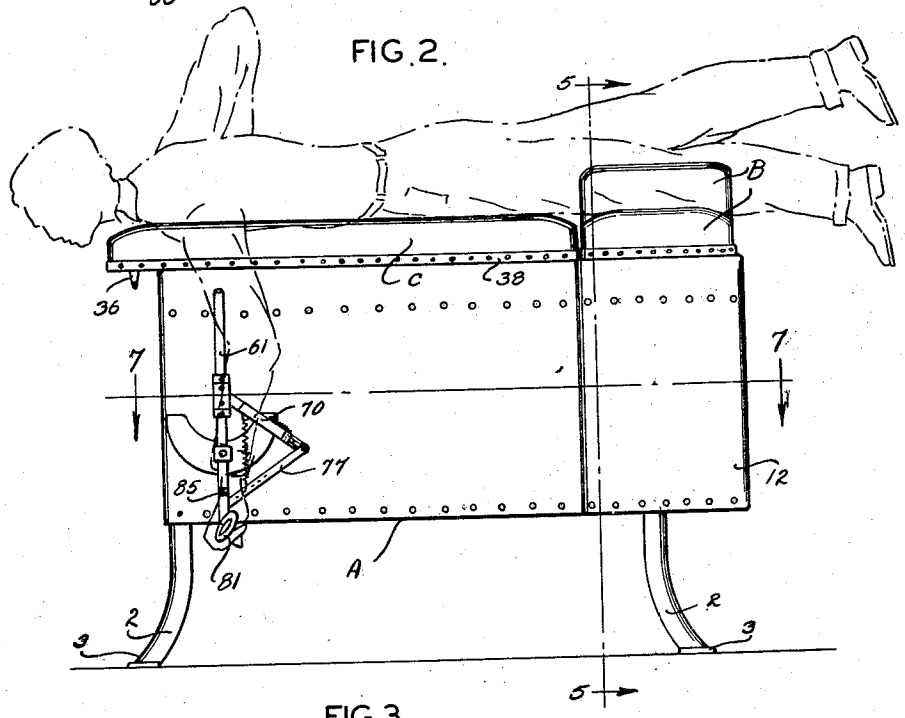
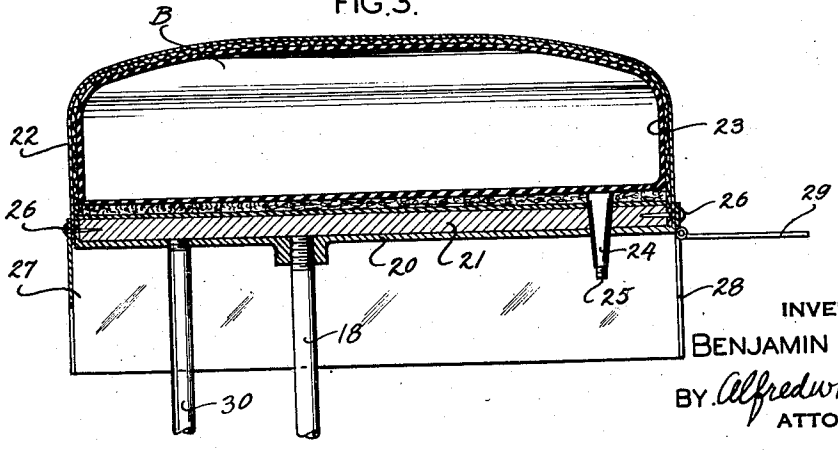


FIG. 3.



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MECHANICAL SWIMMING EXERCISING MACHINE

Filed June 28, 1945 3 Sheets-Sheet 2

FIG. 4.

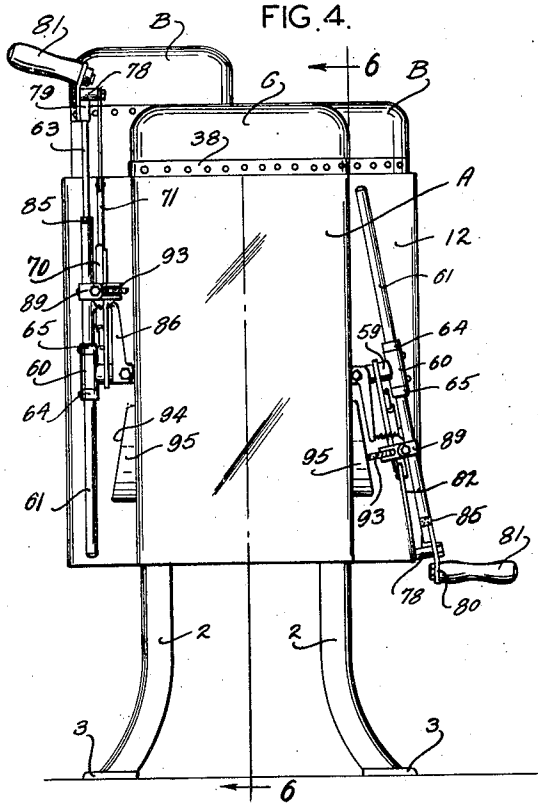


FIG. 5.

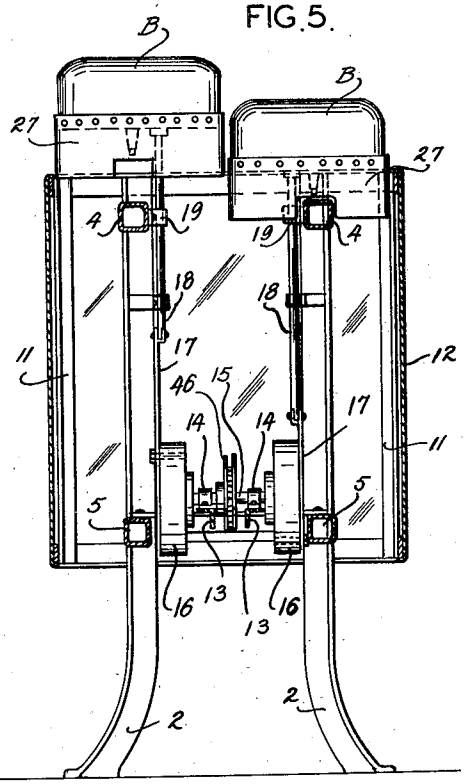
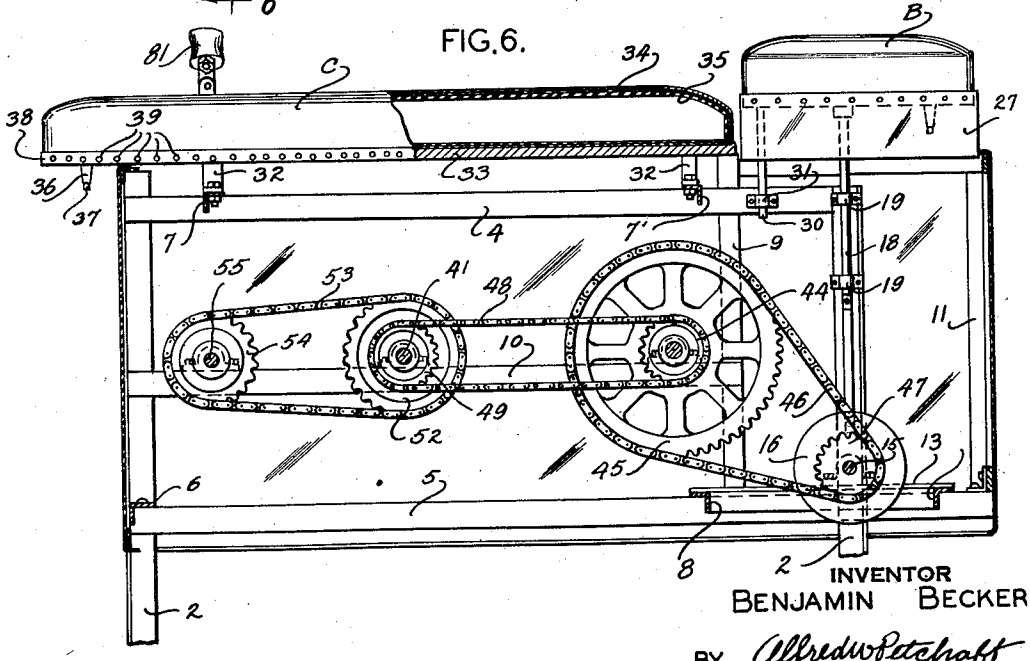


FIG. 6.



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MECHANICAL SWIMMING EXERCISING MACHINE

Filed June 28, 1945 3 Sheets-Sheet 3

FIG.7.

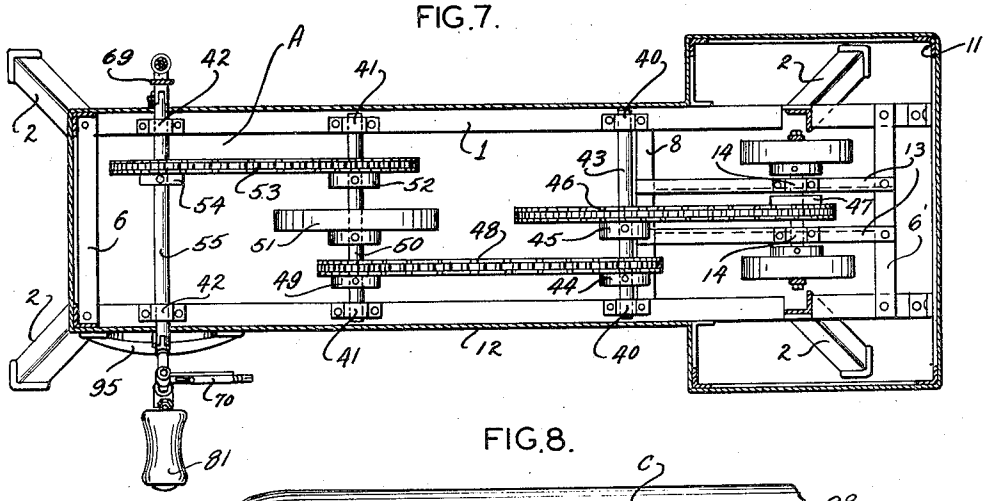


FIG.8.

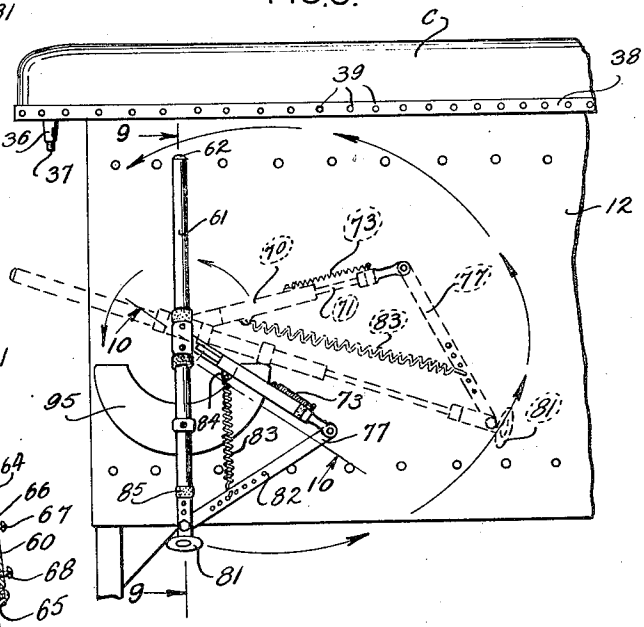


FIG.9.

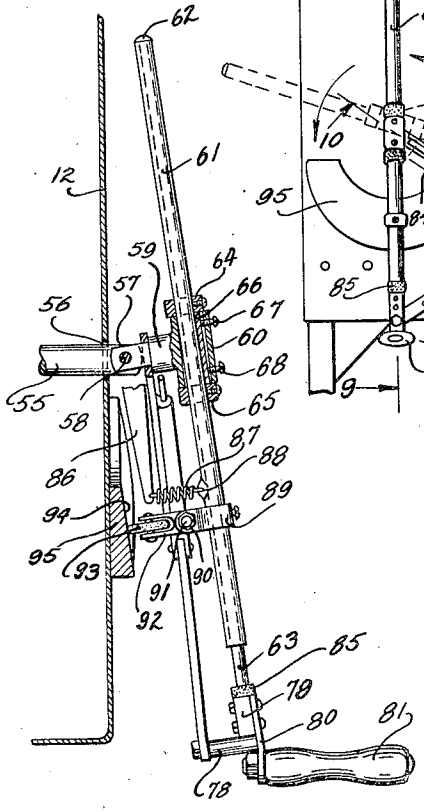
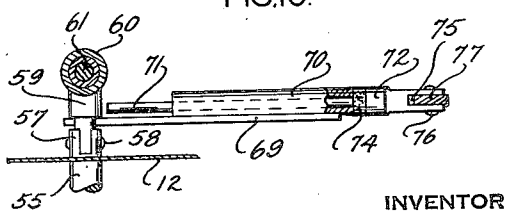


FIG.10.



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2,497,391

MECHANICAL SWIMMING EXERCISING MACHINE

Benjamin Becker, St. Louis, Mo.

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4 Claims. (Cl. 272—71)

1

This invention relates in general to certain new and useful improvements in mechanical exercising machines and, more particularly, to a device for assisting a person in simulating the movements of swimming in a manner which may be referred to as "relaxed swimming."

The present invention has for its primary object the provision of an exercising device capable of assisting an individual in performing body exercises by the simulation of the motions of swimming.

It is also an object of the present invention to provide a device of the type stated which is rugged and durable in construction and is, at the same time, attractive in appearance and economical in cost of construction.

It is an additional object of the present invention to provide a device of the type stated which is relatively compact, so that it may be conveniently set up in a small gymnasium, a basement exercising room, or even in the bedroom of the user so as to be conveniently accessible for exercising purposes.

It is a further object of the present invention to provide a device of the type stated which is comfortable during use in exercising and will not unduly fatigue the user and yet will make it possible for the user to exercise all of the muscles of the body in substantially the same manner as would be the case in actual swimming and, at the same time, to accomplish this result in a convenient, efficient, and more or less relaxed manner.

And with the above and other objects in view, my invention resides in the novel features of form, construction, arrangement, and combination of parts presently described and pointed out in the claims.

In the accompanying drawings (three sheets)—

Figure 1 is a top plan view of an exercising device constructed in accordance with and embodying my present invention;

Figure 2 is a side elevational view;

Figure 3 is a fragmentary vertical sectional view of the device taken along the line 3—3 of Figure 1;

Figure 4 is an end elevational view of the exercising device;

Figure 5 is a vertical sectional view taken along the line 5—5 of Figure 2;

Figure 6 is a longitudinal sectional view taken along the line 6—6 of Figure 4;

Figure 7 is a horizontal sectional view taken along the line 7—7 of Figure 2;

2

Figure 8 is a fragmentary side elevational view of the exercising device, showing the several positions of the arm-stroke members; and

Figures 9 and 10 are fragmentary sectional views of the exercising device taken along the lines 9—9 and 10—10, respectively, of Figure 8.

Referring now in more detail and by reference characters to the drawings, which illustrate a preferred embodiment of the present invention, A designates an exercising machine comprising a main frame 1 formed of angle iron members of suitable gauge and strength and including four vertical legs 2 which are flared outwardly at their lower ends and swaged in the provision of enlarged feet 3. The legs 2 are connected to provide a box-like skeleton framework by pairs of horizontal, preferably tubular, upper side rails 4, 4, and lower side rails 5, 5, and the lower side rails 5, 5, are, in turn, connected by horizontal end bars 6, 6', the end bar 6' being disposed a short distance inwardly from the rearward ends of the lower side rails 5, 5. The upper side rails 4, 4, are similarly connected by transverse angle iron members 7, 7', each disposed a substantial distance inwardly from the forward and rearward ends, respectively, of such upper side rails 4, 4. It should be noted that the lower side rails 5, 5, extend rearwardly beyond the rear legs 2, 2, for a substantial distance and are furthermore transversely connected by an intermediate horizontal strut 8. Each lower side rail 5 is also connected with the corresponding superposed upper side rail 4 by a vertical strut 9 disposed in forwardly spaced parallel relation to the adjacent rear leg 3 and each strut 9 is finally connected with its corresponding forward leg 2 by a lengthwise extending horizontal rail 10 disposed between the upper and lower side rails, 4, 5.

Also formed of flat bar stock, is a rectangular box-like framework 11 mounted around the rear overhanging ends of the lower side rails and extending vertically upwardly to, and slightly beyond, the upper rails 4, 4, and projecting outwardly equidistantly on either side of the rails 4, 4, 5, 5, in the provision of an enclosing framework of somewhat T-shape in horizontal cross-section, as best seen in Figures 1 and 2. The entire framework 1 is enclosed in a continuous apron or sheathing 12 formed preferably of sheet metal or other suitable material having any desired external decorative finish.

Welded or otherwise rigidly secured at their ends to, and extending horizontally between, the end bar 6' and the strut 8, is a pair of spaced parallel bars 13, 13, constructed preferably from

angle iron or other suitable material longitudinally reinforced to eliminate any substantial degree of vertical deflection, and positioned relatively close together and more or less midway between the lower side rails 5, 5. Mounted upon the upper faces of the bars 13, 13, in substantial alignment with the rear legs 2, 2, is a pair of transversely aligned shaft bearings 14, 14'. Journaled in and projecting horizontally through the shaft bearings 14, 14', is a shaft 15, and pinned to both of the projecting ends thereof, are identically shaped or matching crank wheels 16, 16 of such size as to rotate freely in the clear space between the bars 13, 13, and the lower side rails 5, 5, respectively.

Pivotally secured at their lower ends upon the outwardly presented faces of the crank wheels, 16, 16, are upwardly extending connecting rods 17, 17, which are, in turn, rockably connected at their upper ends to vertically reciprocating rods 18, 18, slidably mounted in and extending through vertically aligned pairs of bearings 19, 19, which are respectively mounted upon the inwardly presented faces of the rear legs 2, 2. At their upper ends, the rods 18, 18, are each threadedly mounted in the under faces of horizontally disposed rectangular plates 20, and secured upon the upper faces of the plates 20, is a cushion base-block 21 provided around its peripheral margins with a hollow pillow-like cushion shell 22 formed of leather, leatherette, fabric, or other suitable material having its interior space filled with an inflatable rubber cushion 23, which is, in turn, provided in its bottom wall with a valve tube 24 extending downwardly through the base-block 21 and plate 20, terminating in a conventional air valve 25, all in the provision of so-called knee-pads B operatively disposed within the rear enlarged portion of the frame 1.

Secured peripherally around the cushion block 21 by means of suitable upholstery nails 26 or other like attachment means, is a downwardly projecting sheet metal skirt 27 provided along the rearward panel with a rectangular opening 28, which is provided with a hinged door or closure 29 to afford easy access to the air valve 25 for purposes of inflating or pumping up the air cushion 23.

Each of the plates 20 is furthermore provided, forwardly of the rod 18, with a stabilizing slide rod 30, the latter projecting downwardly therefrom and extending slidably through a vertical slide bearing 31 rigidly mounted upon the inwardly presented face of the adjacent upper side rail 4. It will be noted, by reference to Figure 1, that the knee-pads B are of substantially rectangular shape and each have a horizontal cross-sectional area equal to half the horizontal cross-sectional area of the rear enlarged portion of the frame 1.

Secured upon the transverse angle iron members 7, 7', by means of upwardly projecting brackets 32 and extending forwardly from the knee-pads B for the remainder of the length of the frame 1 and projecting a short distance forwardly therefrom, is a body cushion C comprising a baseboard 33 and a cushion shell 34 secured peripherally thereto and having its interior space filled with a pneumatic cushion 35, which is, in turn, provided in its bottom wall with an air tube 36 extending downwardly through the forward overhanging end of the baseboard 33 and being fitted with a conventional air valve 37. For decorative purposes, the outer peripheral edge of the body cushion C may be trimmed with a suitable binding strip 38 secured by a series of upholstery nails 39 or other like securement elements.

Securely mounted upon the upper faces of the intermediate rails 10, is a rear pair of transversely aligned shaft bearings 40, 40, an intermediate pair of transversely aligned shaft bearings 41, 41, and a forward pair of transversely aligned shaft bearings 42, 42. Rotatably mounted at its ends in, and extending horizontally between, the shaft bearings 40, 40, is a shaft 43 having pinned thereto a small sprocket wheel 44 and a large sprocket wheel 45, the latter being connected by a sprocket chain 46 to a sprocket wheel 47, which is, in turn, pinned upon the shaft 15 approximately midway between the shaft bearings 14, 14. The sprocket 44 is similarly connected by a sprocket chain 48 to a sprocket 49, which is pinned to a shaft 50, the latter being journaled at its ends in, and extending horizontally between, the shaft bearings 41, 41. Also pinned to the shaft 50, is a fly-wheel 51 and a sprocket 52, the latter being connected by means of a sprocket chain 53 to a sprocket 54, which is, in turn, pinned upon a shaft 55 journaled in and projecting through the shaft bearings 42, 42. The ends of the shaft 55 project outwardly through apertures 56 in the apron or sheathing 12 and are diametrally split and apertured, as at 57.

Swingably secured within the split ends of the shaft 55 on opposite sides of the device by means of pins 58, is a T-shaped casting 59 provided with a transverse tubular end section 60, and extending lengthwise through such tubular end section 60, is a relatively long tubular sleeve 61 closed at its one end 62 and internally provided with a snugly fitting reciprocating slide rod 63, which projects outwardly from the other or open end thereof. The tubular sleeve 61 is held adjustably within the tubular end section 60 by means of a pair of set collars 64, 65, so that the longitudinal position of the sleeve 61 within the tubular member 60 may be adjusted to any desired length to accommodate the length of the arm of the person using the exercising machine. It should be noted that the sleeve 61 has an outside diametral size substantially smaller than the inside diametral size of the member 60 and the latter is accordingly internally provided with a lengthwise extending segmental shoe 66, which is held in place by two longitudinally spaced set screws 67, 68, so that the sleeve 61 can be accordingly adjusted within narrow limits to various angular positions in relation to the longitudinal axis of the tubular section 60.

Rockably mounted upon the shank of the casting 59, is a radially projecting flat arm 69, and welded thereto, is a tubular sleeve 70 internally provided with a reciprocating rod 71, which projects outwardly therefrom and is integrally provided at its outer or projecting end with an enlarged head 72 and is normally urged inwardly by means of a tension spring 73 attached at its ends respectively to the outer face of the sleeve 70 and the head 72. Disposed upon the flat or inner face of the head 72 and around the rod 71, is an annular abutment collar 74 formed preferably of sponge rubber or other suitable shock absorbing material. The outer end of the head 72 is provided with a transversely extending milled slot 75, and rockably held within such slot 75 by means of a pin 76, is a secondary arm 77 extending outwardly and being pivotally secured at its outer end to a stud 78 fixed in an end block 79, which is, in turn, welded or otherwise suitably secured

to the outer end of the slide rod 63 and is provided with a projecting plate 80 having a roller type hand-grip 81.

Intermediate its ends, the secondary arm 77 is provided with a plurality of apertures 82 for optionally accommodating one hooked end of a tension spring 83, which is, in turn, at its other hooked end secured in a projecting ear 84 formed integrally upon the arm 69. The tension of the spring 83 may, of course, be adjusted or varied by shifting its hooked end from one to the other of the several apertures 82 and the rod 63 is normally held in inwardly disposed position within the sleeve member 61. In this connection, it should be noted that the end face of the block 79 is preferably provided with an annular shock absorbing ring 85.

Rigidly mounted upon the projecting end of the shaft 55 and extending more or less radially outwardly therefrom, is a bracket 86 apertured at its outer end for receiving one hooked end of a tension spring 87, which is, at its other hooked end, engaged in a retention ear 88 formed integrally upon the outer face of the sleeve member 61, and mounted upon the sleeve member 61 for lengthwise slidable adjustment, is a set collar 89 having a pair of radially projecting spaced parallel ears 90, and rockably mounted therebetween by means of a screw bolt 91, is a small clevis 92 operatively provided with a roller 93 for engagement against the outwardly presented angular face 94 of a segmental cam block 95 rigidly secured upon the outer face of the apron or sheathing 12, all as best seen in Figures 8 and 9. It should be noted in this connection that the spring 87 is of such length and strength as to urge the sleeve 61 and its associated arm-stroke mechanism angularly inwardly, so that the roller 93 will ride against the angular face 94 of the cam block 95.

In setting up the device for use, the knee-pads B and cushions C may be inflated with an ordinary hand air pump or other suitable means to any desired degree for the comfort of the user, it being recognized that some persons may prefer a relatively hard cushion and other persons may require a relatively soft cushion.

The user will place himself in an outstretched position with his chest, stomach, and hips resting upon the cushion C and his knees resting one on each of the knee-pads B in the position shown in Figure 2. It will be noted that, in such position, both the head and feet extend outwardly beyond the exercising device and "in the clear," so to speak. The user thereupon grasps the two handles 81, one of which, of course, is on one side of the machine and the other is on the other side and being intended to be grasped one in the left hand and one in the right hand. It will furthermore be noted that the handle 81 for the left hand will be disposed at 180° to the other handle 81, which is adapted to be grasped by the right hand, that is to say, when the one handle is down, the other handle will be up and vice versa. The user may thereupon rotate the arm-stroke assemblies by swinging his arms very much in the manner which he would do in a normal swimming stroke, retaining at all times his firm grip upon the handles 81. As he stretches his arm, the slide rod 63 will swing out to the position shown in dotted lines in Figure 8, and, as he draws his arm in closely, the spring 83 will shift the rod 63 inwardly to accordingly shorten the stroke. As the handles 81 are rotated, the shaft 55 will be accordingly rotated and such rotary motion will

be transmitted through the several gears and chains to the shaft 15, which will, in turn, rotate the shaft 15 and thereby reciprocate the knee-pads B up and down in alternate movement, assisting the user in simulating the foot kick movement of the normal swimming stroke.

The user may, of course, start slowly and increase speed as his proficiency increases and, similarly, the user may use the machine for increasingly long periods of time as his muscles become stronger and better developed. In any case, it is possible by the use of the exercising device of the present invention to obtain all of the beneficial muscular exercise achieved in actual swimming and do so without undue strain upon any particular muscles. Actually, the exercises may be performed in an almost relaxed manner, so that the ultimate benefits from the movements can be obtained.

It should be understood that changes and modifications in the form, construction, arrangement, and combination of the several parts of the exercising device may be made and substituted for those herein shown and described without departing from the nature and principle of my invention.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. An exercising device comprising a horizontal cushion for supporting the upper portion of the user's body, a pair of vertically reciprocable cushions for supporting the knees of the user, a shaft rotatably mounted beneath the forward end of the horizontal cushion, a T-shaped fitting pivotally mounted on each end of the shaft and having a transverse tubular section, a tubular sleeve held adjustably within and extending through the said transverse tubular section, a slide rod mounted in the sleeve for lengthwise reciprocating extension, a hand grip mounted on the outer end of the slide-rod, V-shaped hinge means rockably connected at one end to the T-shaped fitting and at the other end to the rod and including a transverse spring for normally urging the rod into the sleeve, a bracket secured to and adjacent each end of the shaft, a tension spring secured at one end to the bracket and at the other end to the sleeve for normally urging the sleeve inwardly, an inclined cam block mounted adjacent the path of the sleeve, cam roller means associated with the sleeve for coaction with the cam block for outward movement of the sleeve when the sleeve is rotated, and means connected to and driven by the shaft for moving the knee-supporting cushions up and down in alternate vertical movement responsive to rotary movement of the arm-stroke mechanism.

2. An exercising device comprising a horizontal cushion for supporting the upper portion of the user's body, a pair of vertically reciprocable cushions for supporting the knees of the user, a shaft rotatably mounted beneath the forward end of the horizontal cushion, a T-shaped fitting pivotally mounted on each end of the shaft and having a transverse tubular section, a tubular sleeve held adjustably within and extending through the said transverse tubular section, a slide rod mounted in the sleeve for lengthwise reciprocating extension, a hand grip mounted on the outer end of the slide-rod, V-shaped hinge means rockably connected at one end to the T-shaped fitting and at the other end to the rod and including a transverse spring for normally

urging the rod into the sleeve, a bracket secured to and adjacent each end of the shaft, a tension spring secured at one end to the bracket and at the other end to the sleeve for normally urging the sleeve inwardly, an inwardly projecting cam roller on the sleeve, an outwardly presented segmental cam mounted adjacent the path of the sleeve and engageable with the roller for laterally outward movement of the sleeve as the sleeve is rotated through the lower half of its path of rotation, and means connected to and driven by the shaft for moving the knee-supporting cushions up and down in alternate vertical movement responsive to rotary movement of the arm-stroke mechanism.

3. An exercising device comprising a horizontal cushion for supporting the upper portion of the user's body, a pair of vertically reciprocal cushions for supporting the knees of the user, a shaft rotatably mounted beneath the forward end of the horizontal cushion, a T-shaped fitting pivotally mounted on each end of the shaft and having a transverse tubular section, a sleeve held adjustably within and extending through the said transverse tubular section, a slide rod mounted in the sleeve for lengthwise reciprocating extension, a V-shaped link member comprising a sleeve connected at one end of the T-shaped fitting, a reciprocating rod provided in said sleeve and projecting outwardly therefrom, said reciprocating rod being provided at its outer end with an enlarged head portion, a tension spring attached at one end to the sleeve and at its other end to the enlarged head portion for normally urging the reciprocating rod inwardly, a secondary arm rockably mounted upon the enlarged head portion of the reciprocating rod, an end block secured to the outer end of the slide rod, the outer end of the secondary arm being pivotally secured in the end block, a hand grip mounted on the outer end of the slide rod, a bracket secured to and adjacent each end of the shaft, a spring member secured at one end to the bracket and at the other end to the sleeve for normally urging the sleeve inwardly, an inclined cam block mounted adjacent the path of the sleeve, cam roller means associated with the sleeve for coaction with the cam block for outward movement of the sleeve when the sleeve is rotated, and means connected to and driven by the shaft for moving the knee supporting cushions up and down in alternate vertical movement responsive to rotary movement of the arm stroke mechanism.

4. An exercising device comprising a horizontal cushion for supporting the upper portion of the user's body, a pair of vertically reciprocal cushions for supporting the knees of the user, a shaft rotatably mounted beneath the forward end of the horizontal cushion, a T-shaped fitting pivotally mounted on each end of the shaft and having a transverse tubular section, a first sleeve member held adjustably within and extending through the said transverse tubular section, a slide rod mounted in the first sleeve member for lengthwise reciprocating extension, a V-shaped link member comprising a second sleeve member connected at one end to the T-shaped fitting, a reciprocating rod provided in said second sleeve member and projecting outwardly therefrom, said reciprocating rod being provided at its outer end with an enlarged head portion, a tension spring attached at one end to the second sleeve member and at its other end to the enlarged head portion for normally urging the reciprocating rod inwardly, a secondary arm rockably mounted upon the enlarged head portion of the reciprocating rod, an end block secured to the outer end of the slide rod, the outer end of the secondary arm being pivotally secured in the end block, a hand grip mounted on the outer end of the slide rod, a bracket secured to and adjacent each end of the shaft, a spring member secured at one end to the bracket and at the other end to the first sleeve member for normally urging the first sleeve member inwardly, an inwardly projecting cam roller on the first sleeve member, an outwardly presented segmental cam mounted adjacent the path of the first sleeve member and engageable with the roller for laterally outward movement of the first sleeve member as the first sleeve member is rotated through the lower half of its path of rotation, and means connected to and driven by the shaft for moving the knee supporting cushions up and down in alternate vertical movement responsive to rotary movement of the arm stroke mechanism.

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