March 10, 1936. L. CAMPBELL 2,033,275

SWIMMING INSTRUCTOR

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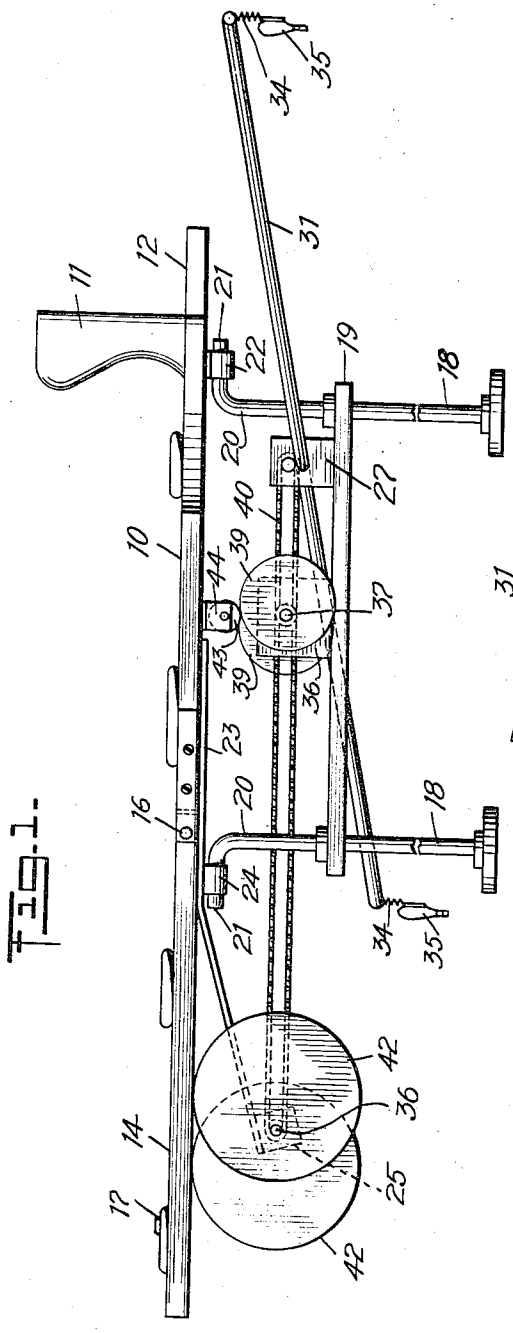


Fig. 1.

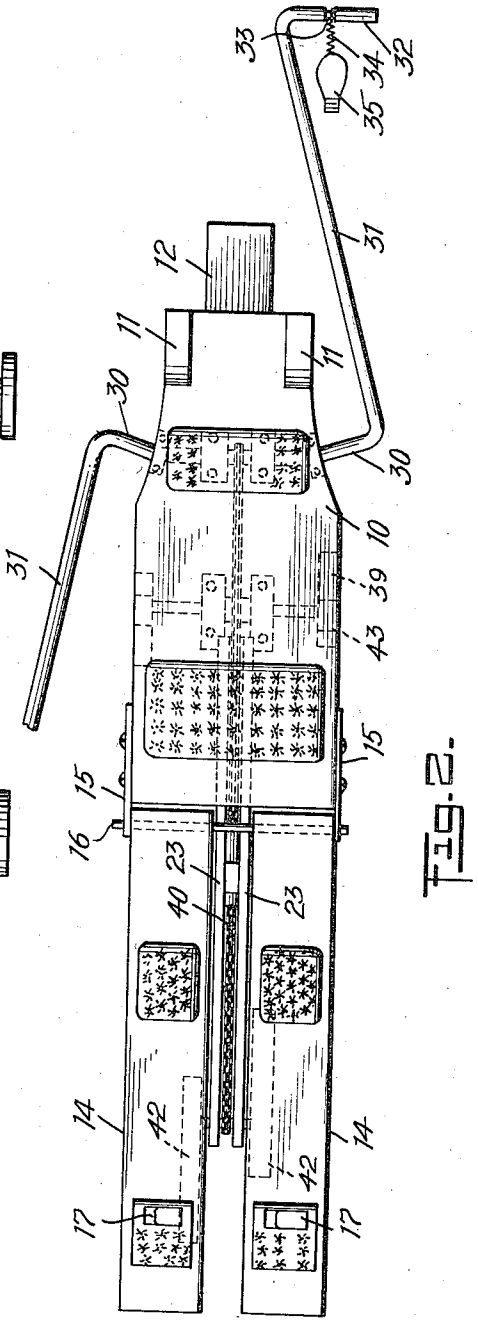


Fig. 2.

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Fig. 3.

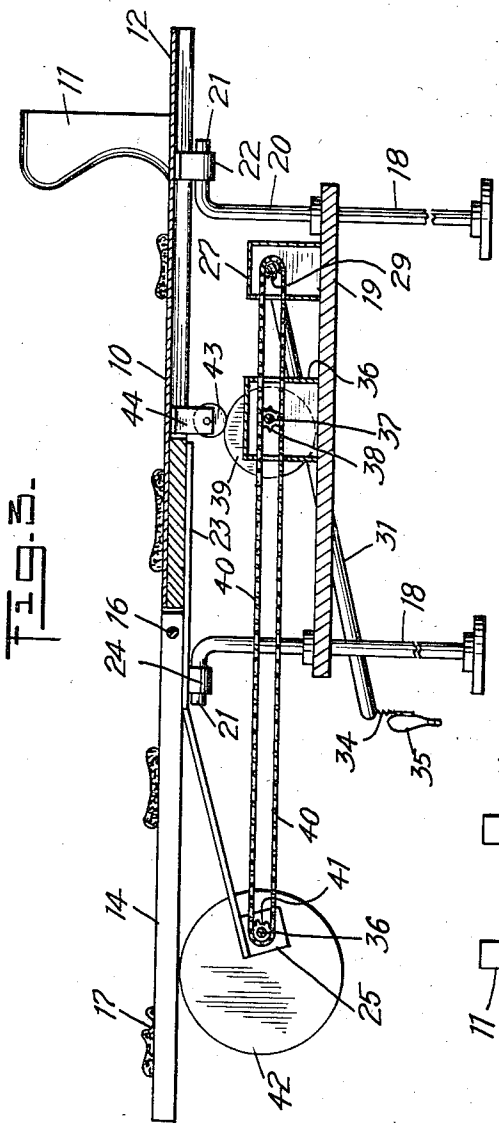


Fig. 5.

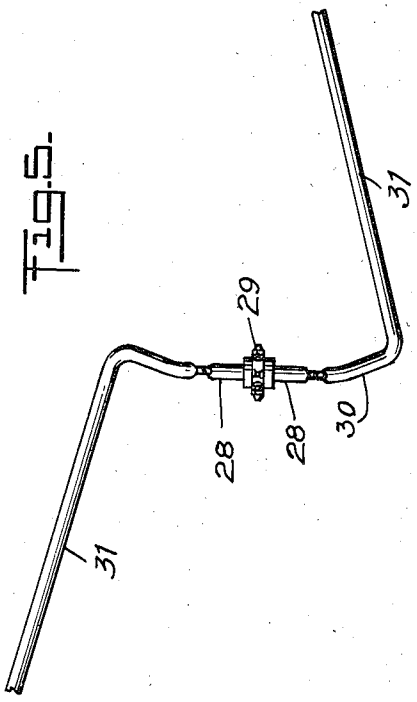
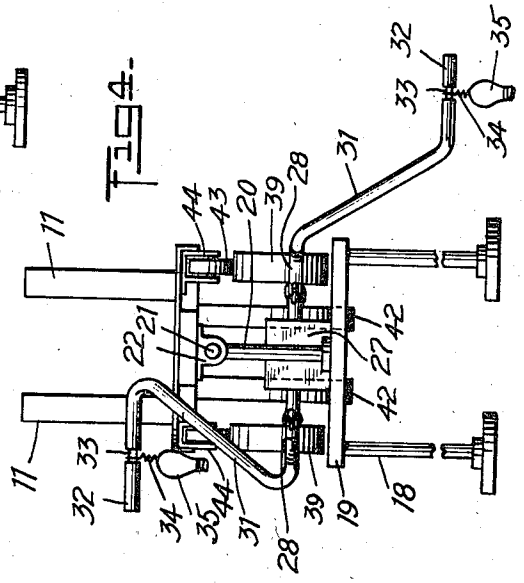


Fig. 4.



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UNITED STATES PATENT OFFICE

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SWIMMING INSTRUCTOR

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Application April 27, 1931, Serial No. 533,029

2 Claims. (Cl. 272—71)

This invention relates to swimming instructors, and more particularly to apparatus of that nature which require no immersion of the learner while being instructed.

Among the principal objects which the invention has in view are: To provide an apparatus simulating all the movements of the body and parts of the body which accompany active swimming in water; to thus develop the muscles and the movements of the person learning to swim; to require exercise of the strength of the learner for operating the device simulating the resistance to movement which actually occurs in swimming; to positively synchronize all of the movements; to include a twisting movement of the body accompanying the hand and leg movement as the learner goes through the cycle of the swimming strokes; to avoid complicated parts or parts from which injury to the user is likely to occur; to secure simplicity of construction and operation; and to obtain other advantages and results as may be brought out in the following description.

In the drawings:

Figure 1 is a side elevation of the swimming instructor embodying my invention;

Figure 2 is a plan view of the same;

Figure 3 is a longitudinal sectional elevation;

Figure 4 is an end view looking at the head end of the apparatus; and

Figure 5 is a detail plan of the hand crank.

In the specification:

In the specific embodiment of the invention illustrated in said drawings, the reference numeral 10 indicates a body plate which is in relatively horizontal position except as it may tilt or twist from side to side as will hereinafter be explained. The forward end of this body plate 10 is provided with shoulder rests 11, 11 between which the user's head may project to rest upon a forward extension 12 of suitable size and shape.

At the rear of the body plate 10 there are provided a pair of leg rests 14, 14, herein shown as pivotally mounted to enable the rear ends to swing up and down. The particular pivotal mounting provides rearwardly directed straps 15, 15 on the side edges of the body plate, the rear part of said straps beyond the said body plate carrying a cross rod 16 which passes transversely through the forward ends of the leg rests. The top of the body plate and the leg rests may be suitably padded for the comfort of the user and preferably recesses 17, 17 are provided in the pads of the leg rests to receive the user's feet.

The construction preferably provides a support for the body holding portion above described, one form of support providing a plurality of legs 18 properly spaced for maintaining equilibrium of the apparatus in use, said legs supporting a table top 19 or similar structure for support of the operating parts. From the ends of the top 19 are carried rigid rocker supports 20, each providing a portion which stands upwardly from the table, and a top portion 21 which is bent to a horizontal position, the two bent portions of the two supports preferably being in axial alinement and here shown as directed outwardly away from each other. The support at one end of the table underlies the body plate 10 with its bent portion 21 substantially parallel to and underlying the center line of said plate at about a position between the shoulder pieces 11, 11.

A suitable hanger 22 is secured to the underside of the body plate 10, and has a fitting engagement with the bent end 21 so as to rock thereupon during use of the apparatus. The other rocker support 20 is positioned substantially beneath the cross rod 16 between the leg rests 14, 14. Suitable stringers 23, 23 extend rearwardly so as not to interfere with swinging said rests up and down. To the underside of these stringers is secured a suitable hanger 24 having a fitting engagement with the horizontal portion 21 of the support 20 thereby mounting the rear end of the body plate 10. The stringers 23, 23, continue rearwardly and downwardly and at their rear ends provide suitable bearings 25 for a cam shaft 26.

At the forward end of the table is provided a housing 27, the sides of which provide bearings for a hand crank 28. The hand crank preferably provides a middle portion extending through said housing transverse to the length of the body plate 10. At the middle part of this central portion of the hand crank is secured a sprocket 29 which turns with the hand crank. The opposite ends of the hand crank are both formed in a similar manner, that is to say, each end of the crank is first bent at a small angle for purposes of eccentricity, this eccentric portion 30 being bent substantially at right angles thereto. This last mentioned portion of the crank comprises the reach 31 of the crank, and at its outer end the crank is bent back again to provide a transverse end portion 32. I have shown this end portion as having a peripheral groove 33, and by way of illustration have shown a coiled spring 34 hung by one end in said groove and having its other end attached to a mitten or other hand-hold 35 for the convenience of the operator.

It will be noted that the eccentric portions

30, 30 of the crank preferably both extend away from the axis of the middle part of the crank on the same side of the axis, for instance, in the particular position shown in Figure 2, both of these eccentric portions 30, 30, slope forwardly away from the axis, and as a result the outer ends of the crank will be given a sidewise motion during rotation of the crank, such that the outer ends of the crank swing away from the table as they are revolved toward the rear of the table and swing inwardly toward the axis of the body plate as they revolve to the forward part of the stroke.

Mounted on the table 19 behind the housing 27 for the crank 28, is another housing 36 which provides bearings for a cross shaft 37 at the middle of which is secured a sprocket 38 and at the ends of which are mounted cams 39, 39. A sprocket chain 40 passes around the sprocket 29 on the crank providing two reaches extending rearwardly from the crank sprocket to the sprocket 38 on the eccentric shaft 37. The parts are arranged so that rotation of the crank will cause rotation of the sprocket 29 mounted thereon, and this rotary movement is conveyed by sprocket chain 40 to the second mentioned sprocket 38 which thereby causes the cams 39 to rotate in synchronism with the rotation of the crank. Sprocket chain 40 after its engagement with the second mentioned sprocket 38 extends rearwardly to a sprocket 41 mounted on the rear cam shaft 26. This sprocket is mounted between bearings 25, 25, and cams 42, 42 are mounted on the ends of said shaft underlying the two leg rests 14, 14. The sprocket chain 40 passes around the rear sprocket 41 and therefore operates the leg rests controlling cams 42, 42, in synchronism with the rotation of the crank 28. The cams 42, 42 are made of appropriate size and spaced an appropriate distance from the hinged mounting of the leg rests to obtain the desired swing for the leg rests in an up and down direction.

It is a feature of the present invention to not only obtain the rotary movement of the learner's hands combined with a synchronized movement of the legs, but to combine therewith a twisting or rocking movement of the body corresponding to that which actually takes place when the stroke is properly performed in the water. This rocking motion is obtained by virtue of the pivotal mounting of the body plate 10 on a longitudinal axis and through the operating agency of the pair of cams 39, 39 underlying the body plate. If so desired, the friction between the cams and the body plate may be relieved in suitable manner as by rollers 43 carried in hangers 44 on the underside of the body plate. It will be noted that these cams maintain a fixed position for the body plate at any instant during the stroke so that the plate will not be affected to produce a wrong position through shifting of the user's weight or an attempt on his part to prevent the rocking motion. Furthermore, the rocking motion is synchronized with the other movements and my improved apparatus will accordingly simulate all positions as they occur when properly performing the stroke in the water.

I claim:

1. An apparatus as characterized comprising in combination a body plate, leg rests hinged to the body plate, cams supporting the leg rests, said cams having a sprocket wheel therebetween for operating the same, a crank for hand operation by the user, a sprocket on said crank, and a sprocket chain extending from the crank sprocket to the cam sprocket wheel.

2. In an apparatus for instructing in the crawl stroke of swimming, the combination with means for supporting the body of the swimmer in prone position, of leg rests hinged to said support, cams supporting the free ends of said leg rests, a shaft having a sprocket secured thereto, said cams secured to said shaft on either side of said sprocket, a crank for hand operation by the user, a sprocket secured to said crank, and a driving connection, including a chain, between said sprockets.

LAYARD CAMPBELL.