

March 1, 1938.

J. B. HUDSON

2,109,775

APPARATUS FOR TEACHING SWIMMING

Filed May 9, 1932

3 Sheets-Sheet 1

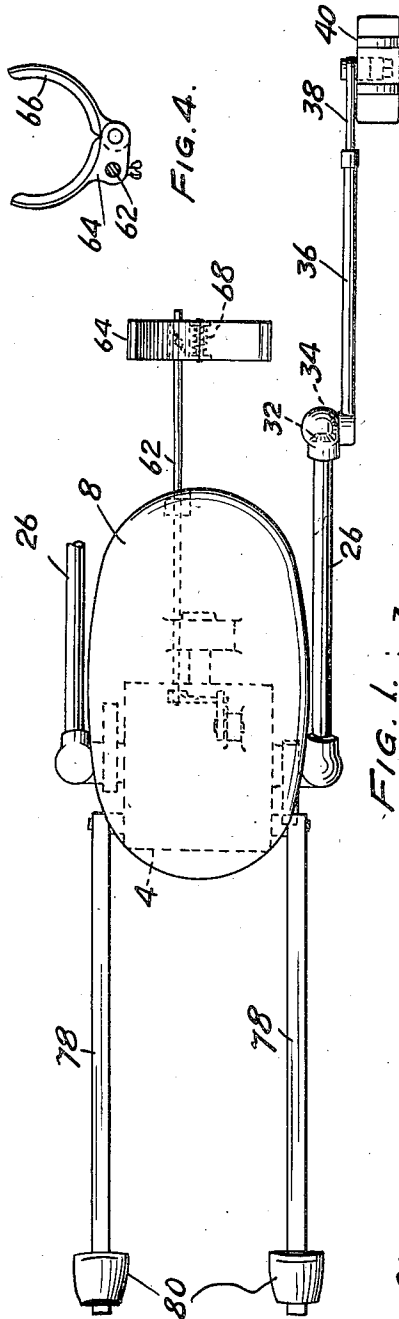


FIG. 4.

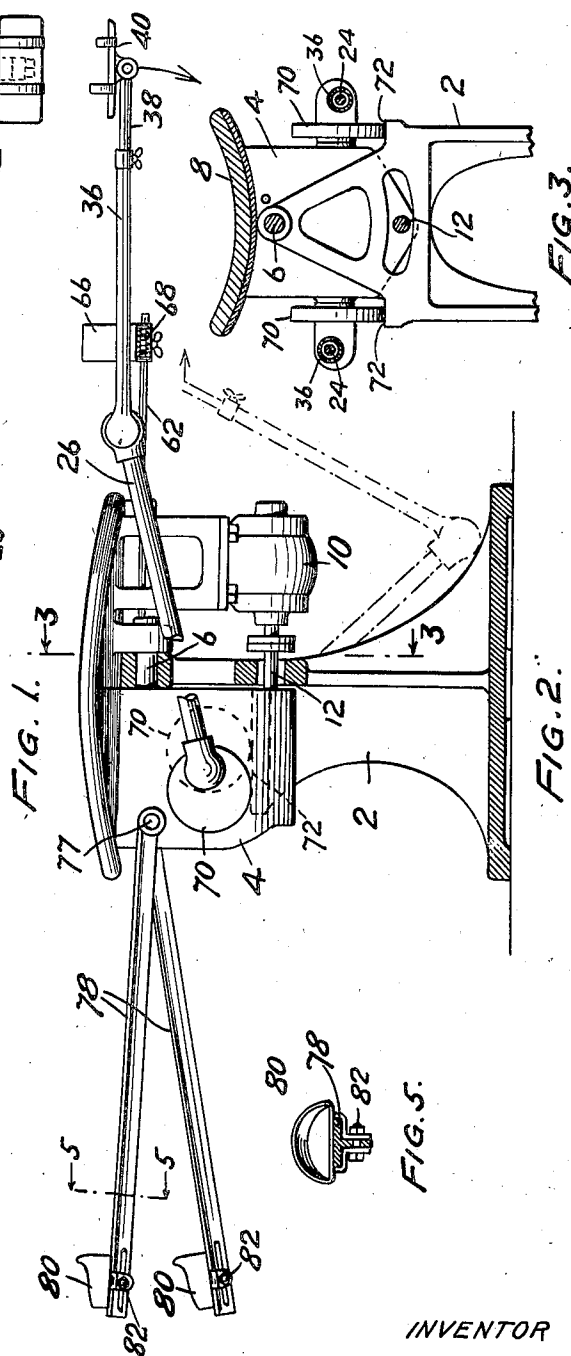


FIG. 1.

FIG. 3.

FIG. 2.

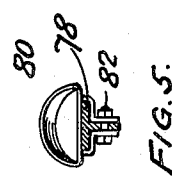


FIG. 5.

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3 Sheets-Sheet 2

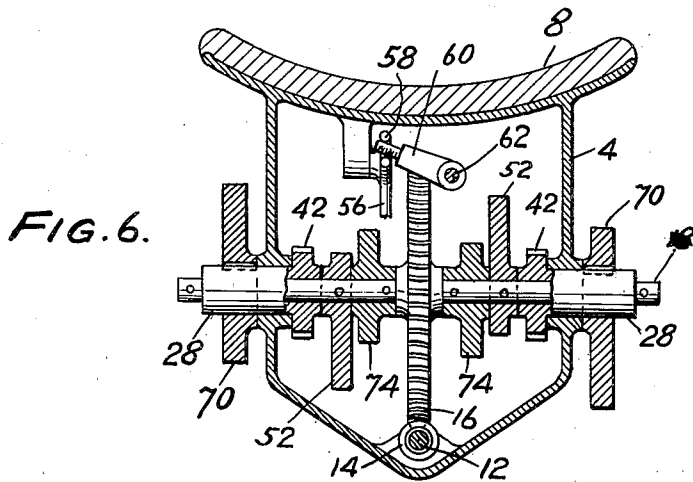
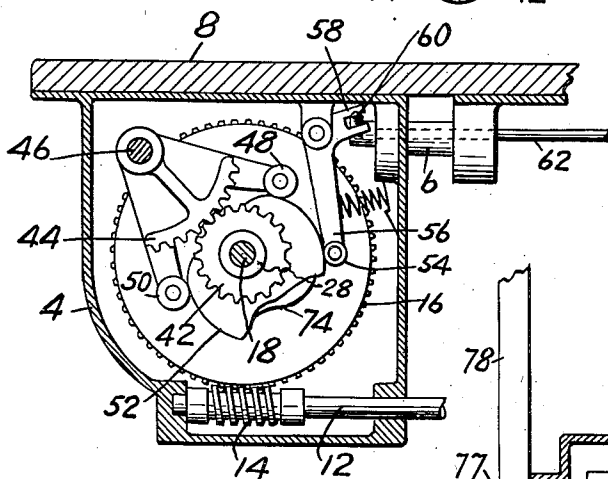
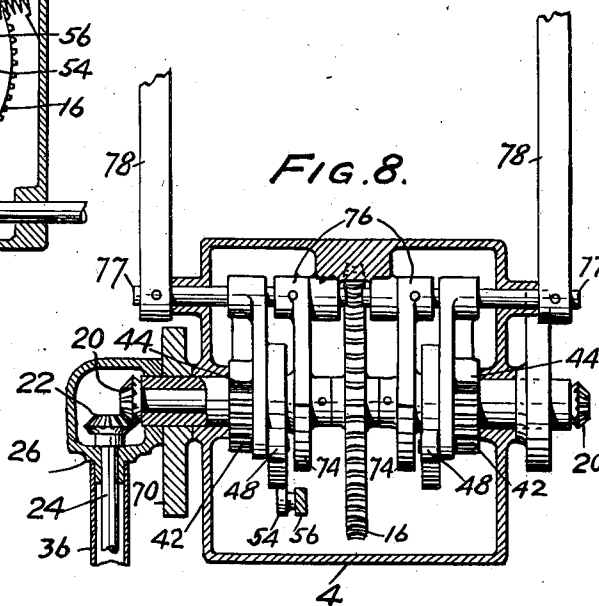


FIG. 7.



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APPARATUS FOR TEACHING SWIMMING

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3 Sheets-Sheet 3

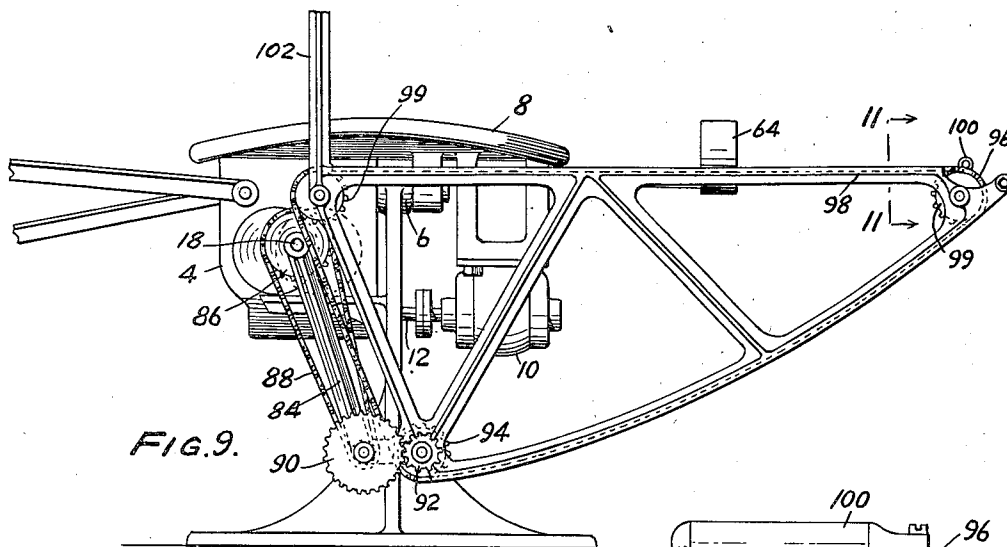


FIG. 9.

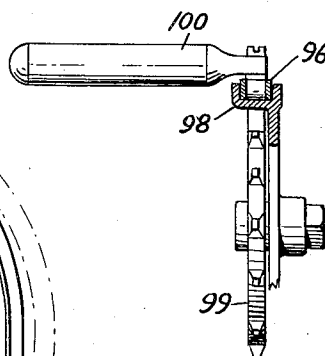


FIG. 11.

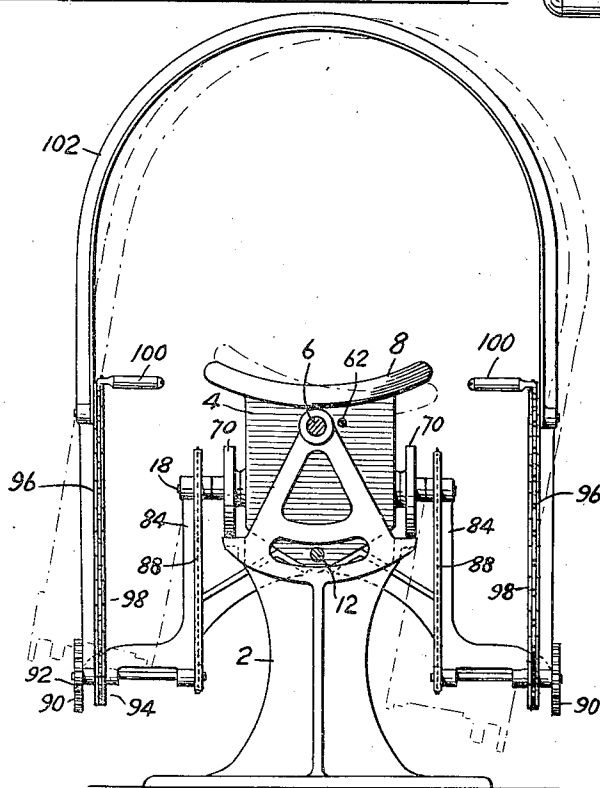


FIG. 10.

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UNITED STATES PATENT OFFICE

2,109,775

APPARATUS FOR TEACHING SWIMMING

Jesse B. Hudson, Philadelphia, Pa.

Application May 9, 1932, Serial No. 610,012

10 Claims. (Cl. 272-71)

This invention relates to a machine for use in teaching swimming and has particular reference to a machine designed for use in the teaching of the crawl stroke.

It is the broad object of the present invention to provide a machine which serves to guide the body through the proper movements for swimming, in general, whether or not these movements involve those used in the crawl stroke. Specifically, however, the machine is designed for use in teaching primarily the crawl stroke. The machine is also capable of being used as an exercising machine.

Other objects of the invention relating particularly to details of construction whereby the broad objects are most readily accomplished will be apparent from the following description read in conjunction with the accompanying drawings in which:

Fig. 1 is a plan view of one form of the apparatus, certain parts being broken away;

Fig. 2 is an elevation of the same partly in section;

Fig. 3 is a vertical section taken on the plane indicated at 3-3 in Fig. 2;

Fig. 4 is an elevation showing a satisfactory type of head rest;

Fig. 5 is a section taken on the plane indicated by 5-5 in Fig. 2;

Fig. 6 is a vertical section taken through the main controlling shaft;

Fig. 7 is a longitudinal sectional view showing various parts of the operating mechanism, certain parts being broken away;

Fig. 8 is a horizontal section through the controlling mechanism;

Fig. 9 is a side elevation of a modified form of apparatus;

Fig. 10 is an end elevation of the same partly in section; and

Fig. 11 is a fragmentary sectional view showing details of construction.

The machine comprises a support 2 on which is pivotally mounted a casing 4 by means of a short shaft 6. The casing 4 is surmounted by a support 8 preferably designed to fit the body. The casing 4 carries a motor 10 which is arranged to drive a shaft 12 carrying a worm 14 arranged to drive a wormwheel 16 as illustrated in Fig. 7. Wormwheel 16 is secured to a shaft 18 from which the various motions of the apparatus are controlled. The shaft 18 carries duplicate mechanisms on the right and left sides and, accordingly, for clarity only the mechanism on one side will be described.

At each end the shaft 18 carries a bevel gear 20. Each bevel gear meshes with another bevel gear 22 carried by a shaft 24 journaled in a suitable housing 26. The housing 26 is carried by a sleeve 28 surrounding shaft 18 and forming a journal for the shaft, the sleeve being itself journaled in the casing 4.

At its forward end the shaft 24 carries a bevel gear 32 meshing with a bevel gear 34 carried by an arm 36 which is pivoted to the outer end of the housing 26. The arm 36 telescopically receives an extension 38 which may be fixed in suitable longitudinally adjusted position by means of a clamping screw, or the like. The extension 38 at its outer end has pivoted thereto a hand holding plate 40 which may be suitably provided with straps so that the hand will be held in proper position.

The sleeve 28 has either secured thereto or formed integral therewith a pinion 42. This pinion is driven by engagement with a toothed segment 44 carried by an oscillating member journaled on a transverse shaft 46 and carrying cam following rollers 48 and 50 engaged by a cam 52 secured to the shaft 18. By reason of these connections as the shaft 18 revolves an oscillatory movement will be imparted to the pinion 42 and the sleeve 28 whereby the housing 26 will be moved from the full line position of Fig. 2 to substantially the position indicated in construction lines in the same figures. At the same time, by reason of the geared connections upon shaft 18, the arm 36 will have a rotary motion about the axis of the bevel gear 34. As a result of combined motions the hand engagement member 40 will be guided in a path properly assumed by the hand of the user in executing the crawl stroke. It will be obvious that the duplicate members on the two sides will be properly timed relative to each other, this being effected by a proper adjustment of the bevel gears and the cams 52.

The cam 52 also operates upon the follower roller 54 carried by a bell crank 56 which is urged into engagement with the cam by a suitable spring. The bell crank is provided with a bifurcated end 58 engaging a lever 60 secured to a longitudinally extending shaft 62 journaled in the casing 4. At its outer end the shaft 62 carries the fixed element 64 of the head rest, this element being longitudinally adjustable along the shaft and secured in adjusted position by a set screw. A movable element 66 is pivoted to the fixed element being urged into closed position by a spring 68. The forehead of the user

is thereby yieldingly held in proper position. As the cam 52 revolves the head rest is rocked so as to give the proper movements to the head which would be used in breathing.

5 The sleeves 28 carry cams 70 which are arranged to engage ledges 72 on the fixed support 2. As these cams oscillate rocking movements are thereby imparted to the casing 4 to produce a rolling movement of the body.

10 Each of the two cams 74 carried by the shaft 18 acts upon a follower 76 pinned to a shaft 77 to which is secured an arm 78. The arms 78 carry at their outer ends foot-receiving stirrups 80 longitudinally adjustable by reason of bolt and slot connections indicated at 82. The cams 15 74 are of a multilobed type so that a number of oscillations are imparted to the stirrups 80 during each rotation of the main control shaft 18. Preferably the arrangement is such as to give 20 six beats since this is the ordinary timing generally used. Of course, by a suitable substitution of cams any number of beats may be provided.

From the above it will be seen that not only are proper motions imparted to the arms and legs 25 but also to the body and head.

Referring now to Figs. 9, 10 and 11, which disclose a different form of apparatus, it may be noted that the casing 4 is of the same type as in the previous modification, the changes being 30 merely in the device whereby motions are imparted to the arms. In this modification the casing 4 carries an extension frame 84. Secured to each end of shaft 18 is a sprocket wheel 86 driving a chain 88 which in turn drives a sprocket 35 wheel connected to a gear 90. The gear 90 drives a pinion 92 to the shaft of which is secured another sprocket wheel 94 arranged to drive a chain 96 which moves within suitable grooves in the frame extension being guided over idle 40 sprockets 99 as indicated. A handle 100 is carried by the chain so as to be grasped by the user of the apparatus with the result that his arms are guided in the proper fashion. The handles 100 are of course located at suitably spaced positions to secure the proper relative timing of the 45 arms. The foot, head and body motions are controlled in the same manner as in the previous modification. The frame 84 is preferably provided with an arched connection 102 to secure 50 rigidity.

It will be clear, of course, that the machine may be readily arranged by the use of suitable controlling cams and different timing gears for use in teaching the American crawl, trudgeon, 55 trudgeon crawl, double trudgeon-crawl, straight crawl, single trudgeon-crawl, Australian crawl, or back stroke, or their variations.

It will also be noted that manual operation of the arms may operate the main controlling shaft 60 so that proper motions will be imparted to the arms, legs and head without the use of a motor.

It will be obvious that numerous modifications may be made in details of construction without departing from the spirit of the invention as defined in the following claims. 65

What I claim and desire to protect by Letters Patent is:

1. An apparatus for swimming instruction including a body support, and means for guiding 70 the hands in predetermined convex, closed paths in upright planes, said means including a jointed arm and means controlling predetermined relative positions of the parts of the arm, motion of the outermost part of the arm being controlled 75

by connections from the pivotal point of the innermost part of the arm.

2. An apparatus for swimming instruction including a body support, means for guiding the feet in up and down movements, and means for 5 guiding the hands in predetermined convex, closed paths in upright planes, said means including a jointed arm and means controlling predetermined relative positions of the parts of the arm, motion of the outermost part of the arm 10 being controlled by connections from the pivotal point of the innermost part of the arm.

3. An apparatus for swimming instruction including a body support, means for positively 15 rocking the body support, and means for guiding the hands in predetermined paths in upright planes.

4. In an apparatus for instructing in the crawl stroke of swimming, the combination with means 20 for supporting the body of the swimmer in prone position, of a guiding trackway on each side of the supporting means defining an orbit for each hand of the swimmer, said orbit extending in a substantially vertical plane and in an approximately horizontal path and also through a sub- 25 stantially arc-shaped path in front of and beneath the shoulder of the supported swimmer, and means adapted to be connected to each hand of the swimmer for guiding said hand along said trackway. 30

5. In an apparatus for instructing in the crawl stroke of swimming, the combination with means 35 for supporting the body of the swimmer in prone position, of leg rests mounted each for separate swinging movement, a guide for directing each hand of the swimmer in alternation through an orbit extending in a substantially vertical plane first forwardly in an approximately horizontal 40 path and then downwardly and backwardly through a substantially arc-shaped path in front of and beneath the shoulder of the supported swimmer, interconnected mechanism for coordinating the movement of the legs and arms comprising means for reciprocally moving the 45 legs up and down in alternation and in timed relation to the movement of the hands, and means driven by the hands of the swimmer for driving said mechanism.

6. An apparatus for the instruction of swimming, comprising a body support having a portion 50 mounted to roll from side to side, leg supports hingedly connected with the body support adapted to impart predetermined movement to the legs, endless guide tracks at opposite sides of the body support, a flexible element movable 55 about each endless track, means carried by said flexible elements to carry the arms through substantially predetermined paths of motion, and common means to drive said endless elements about the tracks, to rock the said portion of the 60 body support, and to actuate the leg supports all in proper coordination.

7. An apparatus as characterized, comprising a body plate pivoted longitudinally on an axis between the sides of said plate, means to guide the 65 hands of the user through a path in simulation of a swimming stroke, and means connected therewith and to the body plate for rocking the body plate from side to side upon operation of the first said means. 70

8. 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 mounted each for separate swinging movement, a guide for directing each 75

hand of the swimmer in alternation through an orbit extending in a substantially vertical plane first forwardly in an approximately horizontal path and then downwardly and backwardly
5 through a substantially arc-shaped path in front of and beneath the shoulder of the supported swimmer, interconnected mechanism for coordinating the movement of the legs and arms comprising means for reciprocatively moving the legs
10 up and down in alternation and in timed relation to the movement of the hands, and means for driving said mechanism.

9. An apparatus as characterized comprising a

body plate pivoted longitudinally on an axis between the sides of said plate, operating means for the apparatus, and means connected therewith and to the body plate for rocking the body plate from side to side upon operation of the
5 first said means.

10. An apparatus as characterized comprising a body plate pivoted longitudinally on an axis between the sides of said plate, operating means for the apparatus, and a cam connected therewith
10 and to the body plate for rocking the body plate from side to side upon operation of said means.

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