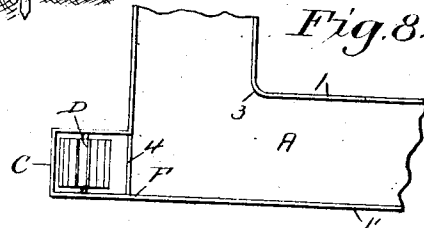
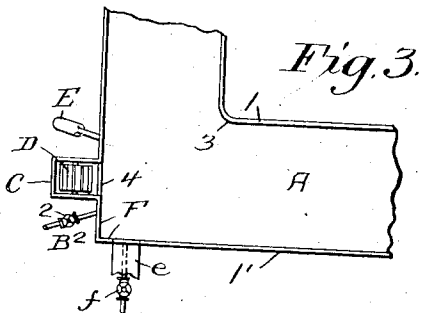
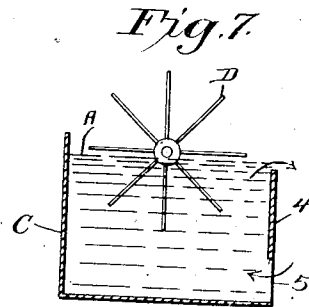
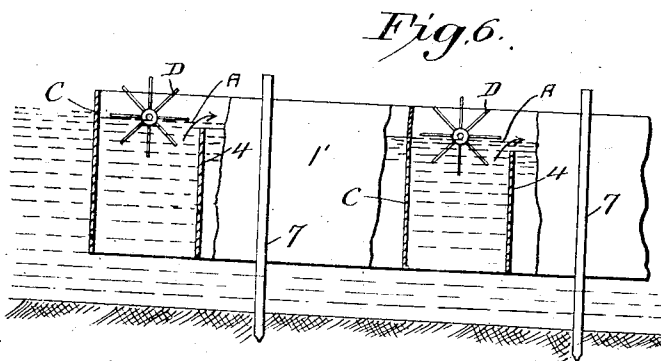
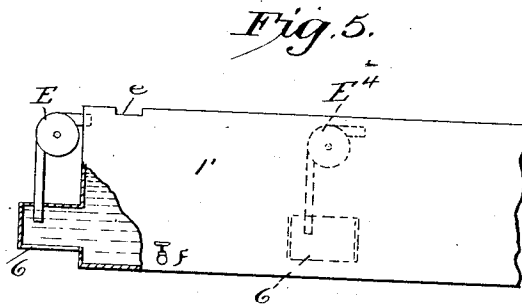
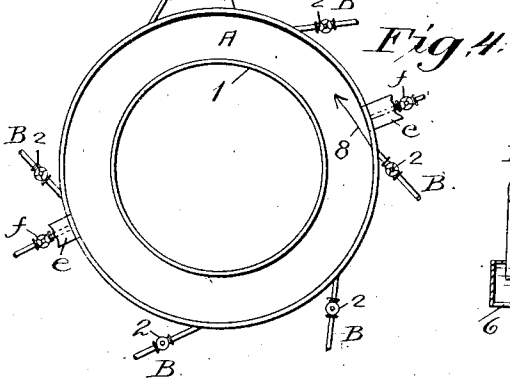
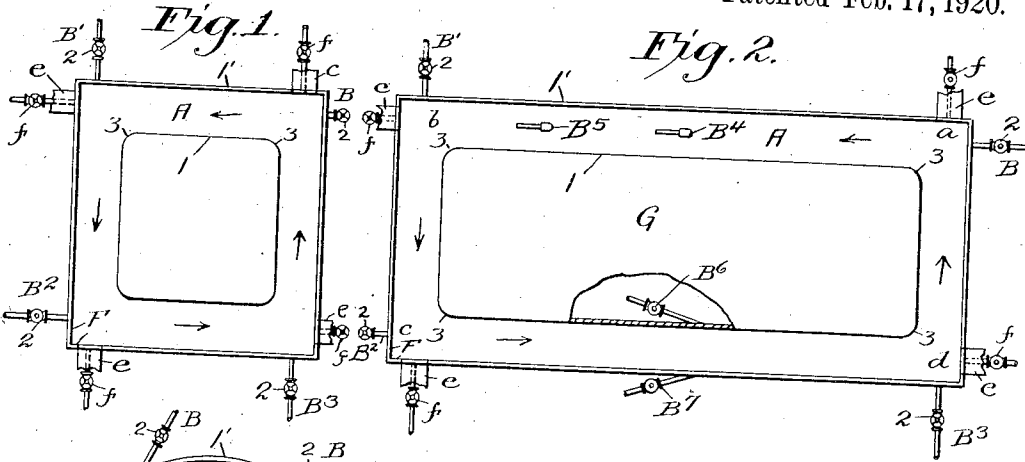


J. W. LIPPINCOTT.  
SWIMMING COURSE.  
APPLICATION FILED AUG. 22, 1919.

1,331,270.

Patented Feb. 17, 1920.



Inventor:  
John W. Lippincott

# UNITED STATES PATENT OFFICE.

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## SWIMMING-COURSE.

1,331,270.

Specification of Letters Patent.

Patented Feb. 17, 1920.

Application filed August 22, 1919. Serial No. 319,139.

*To all whom it may concern:*

Be it known that I, JOHN W. LIPPINCOTT, a citizen of the United States, residing at Little Rock, in the county of Pulaski and State of Arkansas, have invented new and useful Improvements in Swimming-Courses, of which the following is a specification.

My invention relates to endless swimming courses and means for producing and maintaining a continuous and endless surface current therein that will be of material aid to swimmers. This application is a continuance in part of applicant's former case, Serial No. 279,497, filed February 27, 1919 for swimming courses.

Swimming downstream is one of the easiest, most pleasing and exhilarating forms of exercise that can be had, and anyone can easily learn to swim downstream in perfect safety in a current of from two to four miles per hour if the water is not above the breast, but most natural streams are of variable depths, *i. e.* shallow in places and too deep to wade in other places, hence, are very dangerous to those who cannot swim and are, therefore, shunned by beginners. The safest places afforded by nature for people to learn to swim are, therefore, ponds or lakes where the bottom is nearly level and the water is wadable, but learning to swim in standing water is the hardest work anyone can do and is, therefore, shirked by the majority of people. The objects of this invention are, therefore, to provide a swimming course wherein people can learn to swim with ease and perfect safety and wherein good and indifferent swimmers may enjoy the pleasure and exhilaration of constant downstream swimming and incidentally to greatly develop this useful but greatly neglected art for the betterment and greater safety of mankind, and I attain all of these objects by the means illustrated in the accompanying drawings in which—

Figure 1 is a top or plan view of a rectangular shaped endless swimming course and means to produce an endless surface current therein.

Fig. 2 is also a top or plan view of an endless swimming course differing from Fig. 1 in form and showing additional or auxiliary means for accelerating the current.

Fig. 3 is a fragmental top or plan view of the corner F of the swimming course showing a plurality of current producing means.

Fig. 4 is a top or plan view of a circular swimming course and means to produce a current therein.

Fig. 5 is a fragmental detail side view of Figs. 1 and 2 when the swimming course is installed on land.

Fig. 6 is a fragmental detail side view of Figs. 1 and 2 when the swimming course is installed in wadable water.

Fig. 7 is a side detail view of a water wheel installed over a well.

Fig. 8 is a fragmental top or plan view of the corner F of the swimming course showing a water wheel installed as a current producing means.

Similar letters and numerals refer to similar parts throughout the several drawings.

Referring first to Fig. 1, which is designed to be installed on land. A designates the surface of the swimming course confined by the walls 1 and 1'. B, B', B<sup>2</sup> and B<sup>2</sup> designate water supply pipes, each of which is connected to a water source that is at a suitable elevation to the swimming course *e. g.* water raised to a higher level by a dam. The swimming course as illustrated herein is rectangular and the four sides are of equal length, and each side is considered and referred to herein as a stretch. One of the supply pipes is located near the middle of and near the beginning of each stretch and at or near the surface of the water in the swimming course so that when the valves 2 are open a stream of sufficient volume and velocity will be discharged therefrom to enforce a current on the surface of said swimming course to materially aid swimmers. The natural tendency of water when discharged from these supply pipes will be to flow away from their orifices in straight but divergent lines. The width of these diverging lines at a given distance from their source (point of origin) will depend upon the velocity of the stream *i. e.* a slow stream has more time to diverge within a given distance than a swift one, hence, the velocity of the water as it emerges from the supply pipes and the width of the course will have to be considered so that the inner divergent wave line will not impinge at right angles on the inner wall 1 or even on the corners 3 of the inner wall in order to avoid the production of a counter current and, therefore, an eddy, and also the possibility of forcing swimmers into a collision

with the wall 1' or corner 3. The primary function of the walls 1 and 1' is of course to retain the water in the swimming course, but when the divergent wave lines make contact with them a considerable portion is caused to react (rebound) toward the middle of the swimming course and a crest will be formed where the two reacted waves meet. The crest thus formed will be the swiftest part of the stream and if the current producing means are suitably positioned and disposed the crest will be near the middle of the course, and will tend to keep the swimmers away from the walls just as floating objects tend to stay in midstream of natural water courses. A stream of water from either of these supply pipes would by itself produce and maintain an endless surface current throughout the swimming course in the direction indicated by the arrows, but the current would impinge at right angles on the wall 1' at the lower or driftward end of each of the four stretches and would, therefore, if strong enough cause swimmers to forcibly collide with the wall at the driftward end of each stretch which would be dangerous. In order to overcome this objection the supply pipe B is disposed so that a stream discharging therefrom will produce a straightaway current confined by the two walls 1 and 1', which if of a velocity of two or more miles per hour will enable people to swim or float with the expenditure of but little of their own energy from *a* to *b*, when they arrive at *b* they will collide with the wall if the current is strong enough (and no provision is made to stop them) but they will enter into and be influenced by a transverse stream or current discharging (emanating) from the supply pipe B' which will turn them at right angles to the *a-b* line, and prevent accidental collision with the wall and carry them straightaway to *c* where they will enter into and be influenced by a stream emanating from the supply pipe B<sup>2</sup> and transverse to the *b-c* stretch, which will again turn them at right angles and carry them straightaway to *d* where they will enter into and be influenced by a stream emanating from the supply pipe B<sup>3</sup>, transverse to the *c-d* stretch, which will also turn them at right angles and carry them straightaway to starting point *a*, when they will have rounded the course and are again in the *a-b* stretch and influenced by the stream from the supply pipe B. It is no doubt obvious that they may round the course as many times as they may desire without stopping.

The enforcement of the transverse current across the straightaway current near the driftward end of each stretch will act upon swimmers or floating bodies and enable them to round the corners involuntarily, and incidentally therefore prevent accidental col-

lision with the wall 1' at the driftward end of each stretch and this is one of the principal features of this invention.

In the forms illustrated by Figs. 1 and 2 fresh water is being constantly introduced into the swimming course, hence, it is necessary to provide one or more outlets for as much water as flows in after the swimming course is as full as desired. One of these outlets is preferably located at each outer corner *i. e.* in the transverse wall at the lower or driftward end of each stretch. These outlets may be merely depressions *e* shown in Figs. 1, 2, 3, 4 and 5 in the top of the wall through which the surplus water will flow, or valved outlet pipes *f* shown in Figs. 1, 2, 3, 4 and 5 may pass through the wall 1' near the bottom of the course through which the surplus water may pass. The object in locating the outlets as indicated is so that outgoing water will have no influence over either the straightaway or transverse current.

As moving water has its velocity slackened by friction, tendency to adhere to the walls and head resistance of the air and water it is obvious that if the stretches (distances between forces) were long enough the current would become too sluggish to aid swimmers as much as desired, hence, it may be desirable in order to maintain a more uniform velocity throughout the swimming course to provide other (auxiliary) water supply pipes and dispose one or more of them in midstream in each of the stretches, as for example, B<sup>4</sup> and B<sup>5</sup> shown in the *a-b* stretch Fig. 2 or if desired or required they may be placed at or near either or both sides, as for example B<sup>6</sup> and B<sup>7</sup> shown in the *c-d* stretch Fig. 2.

If no elevated supply of water (dam or impounded water) is available a well like structure C illustrated in detail by side view Fig. 7 and top view Fig. 8 may be located near each of the positions previously indicated for the water supply pipes and a water wheel D mounted on each and suitably disposed so that when they are rotated they will produce a satisfactory endless surface current in the swimming course. The front or inner wall 4 of each of these wells is submerged (below the surface) so that when the water wheel is rotated at the proper speed each paddle or blade thereof will put a wave of the desired volume and velocity into motion in the desired direction. An opening 5 is provided near the bottom in the front wall of each well so that as water is displaced at the top by the rotating water wheel other water will flow in through this opening 5 and not disturb the surface current. It is no doubt obvious that auxiliary wells and water wheels may be installed in mid-stream or at one or both sides at frequent intervals in each stretch of the swim-

ming course in lieu of the auxiliary water supply pipes B<sup>4</sup>, B<sup>5</sup>, B<sup>6</sup> and B<sup>7</sup> tending to maintain a uniform current. In the latter case the opening 5 may be provided in each or either of the walls of the well as may be required to connect with the water in swimming course.

Pumps E, etc., may be located just outside of the outer wall 1' and connected by an underground pit 6 with water in the swimming course at the beginning of each stretch (as is shown in Fig. 5 where a portion of the wall is removed to show this connection in detail) and suitably actuated to produce an endless surface current in and throughout the swimming course instead of either of the means heretofore described. Auxiliary pumps E<sup>4</sup>, etc., similarly connected (as is also shown in Fig. 5 where another portion of the wall is removed) with the water in the swimming course and suitably disposed just outside the walls 1 and 1' may also be substituted for the accelerating means heretofore described or they may also be installed in midstream. In the latter case, however, no pit will be needed.

The swimming course illustrated by side view Fig. 6 is designed to be installed in water that is wadable, *i. e.* three to four feet deep and of about constant depth. The walls 1 and 1' may be supported by posts or piles 7 and may extend from a few inches above the surface of the water to the bottom or they may extend to only about eighteen inches below the surface. The function of the walls in this modification is merely to confine and direct a mechanically produced endless surface current. The endless surface current for this modification may be produced by water discharged from pipes as B, B', B<sup>2</sup> and B<sup>3</sup> and as many suitably disposed auxiliary supply pipes as may be needed as for instance B<sup>4</sup>, B<sup>5</sup>, B<sup>6</sup> and B<sup>7</sup> as is illustrated in Fig. 2 in order to maintain a nearly uniform velocity throughout the swimming course, or wells C and water wheels D or pumps E may be substituted for the water supply pipes B, B', B<sup>2</sup> and B<sup>3</sup> to produce the desired surface current in this modification by positioning them and disposing them similarly to the water supply pipes. In this modification, however, if the water wheels are used they may be suitably mounted in open water just outside the walls at the beginning of each stretch, but in order to prevent the objectionable introduction into the swimming course of matter that may be floating on the surface of the outside water I prefer to utilize the wells over which to mount the water wheels and thereby cause the water that is forced into the swimming course by said water wheels over the submerged wall 4 to be replaced through the open bottoms of the wells and this also applies to any auxiliary water wheels that may

be positioned at the sides of the swimming course, and utilized as accelerating means in lieu of the accelerating pipes B<sup>4</sup>, B<sup>5</sup>, B<sup>6</sup>, and B<sup>7</sup>, but the walls in either case need only extend a foot or so below the surface as is shown in Fig. 6 where portions of the wall 1' is removed.

The space designated by G, which will probably be a considerable area between the inner walls 1 may be a raised platform which may be utilized for a walkway, dancing floor, dressing rooms or any other desirable purpose by bridging the swimming course.

The simplest design of an endless downstream swimming course as herein contemplated would consist of four equal sides, and, therefore, each of the four stretches would be the same length and an equal amount of power would produce a current of the same velocity in each. The course, may however, be circular or of any other form or design, but any form other than a square would complicate matters, and the positioning of means to produce the current of the desired velocity and in the desired direction would have to be carefully considered in order to get uniform and satisfactory results, *e. g.* if the swimming course was circular in shape, as is illustrated by Fig. 4 and the circumference was great enough there might be any number of stretches. The number would be modified to some extent by the width of the swimming course and also by the angle at which the various current producing means were disposed with respect to the circle and whether they were all positioned inside of the outer wall 1' (as illustrated) or if some of them were positioned outside of the inner wall 1. In any case each straightaway current will have to be intercepted and absorbed by a transverse current at a point just before it would normally impinge on the wall 1' as illustrated by the arrow 8 in Fig. 4 and the transverse current can only be projected by means positioned near the outer wall 1'. Obviously the water supply pipes B, etc., the water wheels D, etc., or the pumps E, etc., are equally as well adapted to use in this modification as in either of the other forms.

It is not contemplated herein to move and keep moving the entire contents of the swimming course, but to merely produce a current on the surface, which is all that is required to be of material aid to a swimmer, and each of the three means illustrated and described herein will produce the desired result in either form of swimming course herein illustrated and described. It is obvious that two or more of either of the surface current producing means or any desired combination of the three may be used instead of one at the beginning of each stretch as is illustrated in Fig. 3.

Having thus described my invention what I claim and desire protected by Letters Patent of the United States is:

1. The combination in an endless swimming course comprising a multiplicity of stretches, of walls to confine a current to the swimming course, a means near the beginning of each stretch to produce a straightaway current therein, the stretches connected and disposed so that the straightaway current in each stretch will merge near the driftward end thereof and near the beginning of its succeeding stretch with the current of said succeeding stretch and thus form a resultant and, therefore, a continuous and endless current throughout the swimming course.

2. The combination in an endless swimming course comprising a multiplicity of stretches, of walls to confine a current to the swimming course, a means near the beginning of each stretch to produce a straightaway current therein, the stretches connected and disposed so that the straightaway current in each stretch will merge near the driftward end thereof and near the beginning of its succeeding stretch with the current of said succeeding stretch and thus form a resultant and, therefore, a continuous and endless current throughout the swimming course, and additional means suitably installed at suitable intervals in each of the stretches to accelerate the diminishing velocity of the current to tend to keep it at a nearly uniform velocity throughout the swimming course.

3. The combination in an endless swimming course of walls to confine a current and means to produce a straightaway current in each stretch of the course, means for producing each straightaway current disposed to produce a transverse current at a suitable angle to and absorb the current in the preceding stretch and suitable outlets at suitable places in the outer wall for the outlet of surplus water.

4. The combination in a swimming course

comprising a multiplicity of stretches of walls to confine a current, a means near the beginning of each stretch disposed to produce a straightaway current therein and the stretches disposed so that each straightaway current will merge near the driftward end of that stretch with a transverse current near the beginning of a succeeding stretch and thus form a resultant and, therefore, a continuous current throughout the swimming course, auxiliary means at suitable intervals and places in each stretch to tend to keep the current at a uniform velocity, and outlets at suitable places in the outer wall for the outlet of surplus water.

5. The combination in an endless swimming course comprising a multiplicity of stretches, of walls to confine a current to the swimming course, a water wheel suitably disposed and mounted over a well near the beginning of each stretch, the walls of the well adapted to permit an inflow at the bottom and an enforced outflow at the top when the water wheel is rotated, and auxiliary water wheels suitably disposed and mounted over other suitable wells at suitable places and intervals to accelerate the diminishing velocity of the current to tend to keep it at a nearly uniform velocity throughout the swimming course.

6. The combination in an endless swimming course comprising a multiplicity of stretches, of walls to confine a current to the swimming course, means near the beginning of each stretch to produce a straightaway current therein, additional current producing and current accelerating means for drawing water from near the bottom of the swimming course, the stretches connected and disposed so that the straightaway current in each stretch will merge near the driftward end thereof and near the beginning of its succeeding stretch with the current of said succeeding stretch and thus form a resultant and therefore continuous and endless current throughout the swimming course.

JOHN W. LIPPINCOTT.