March 14, 1933. J. L. BELCHER 1,901,219

BREATHING APPARATUS

Filed July 30, 1932

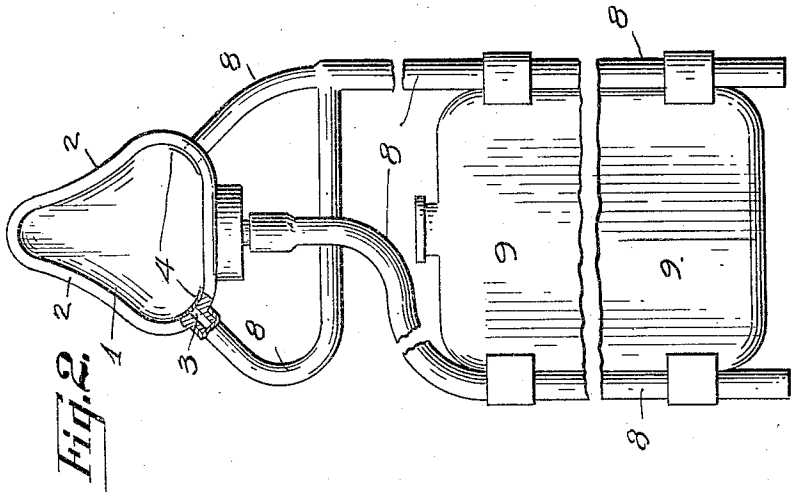

Fig. 2.

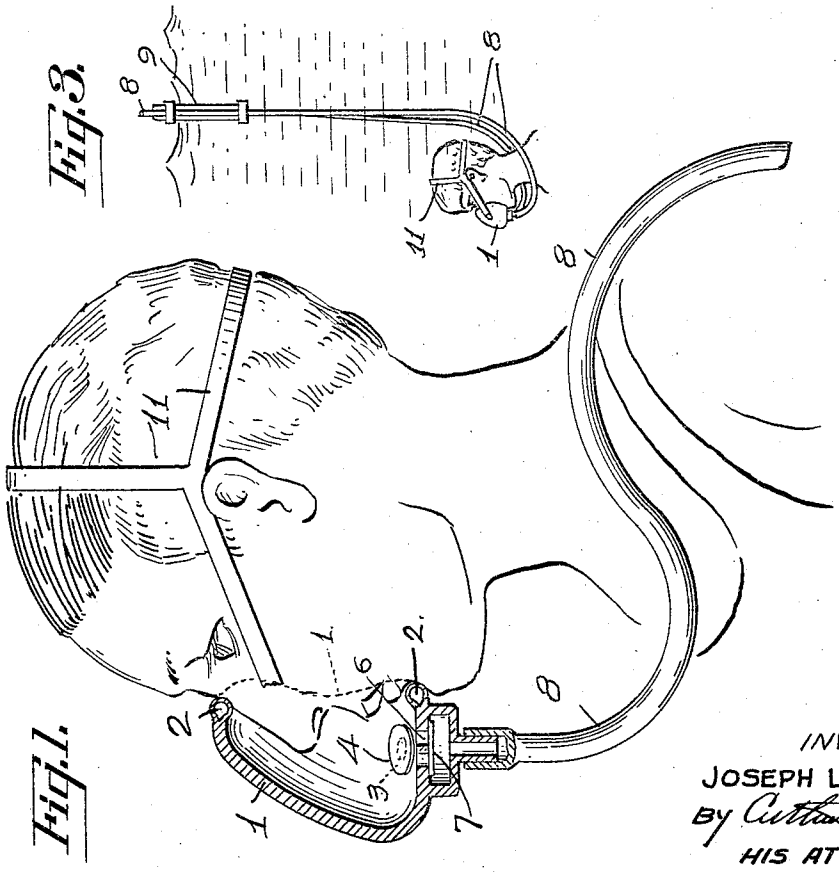

Fig. 3.

Fig. 1.

INVENTOR.
JOSEPH L. BELCHER.
By Curtis L. Slee.
HIS ATTORNEY.

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UNITED STATES PATENT OFFICE

JOSEPH L. BELCHER, OF LONG BEACH, CALIFORNIA

BREATHING APPARATUS

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My invention relates to improvements in breathing apparatus for submerged persons, wherein a housing having an opening embracing the nostrils and mouth of a wearer operates in conjunction with tubes connected to said housing and a float arranged to normally retain the open ends of said tubes projected above a body of water within which a wearer may be submerged, whereby said wearer may be supplied with fresh air through said tubes by the natural process of breathing.

The primary object of the present invention is to provide a new and improved device of the character set forth arranged to supply fresh air to a submerged person by the natural process of breathing, whereby air pressure producing mechanisms may be effectively dispensed with.

A further object is to provide a new and improved device as set forth which may be worn by persons learning to swim, whereby they may be able to breathe when temporarily submerged, to maintain confidence in said wearer while learning, or while in the water.

A still further object is to provide a new and improved device of the character set forth having improved means for permitting circulation of air in one direction only, through a pair of tubes, each having their upper ends normally projected above the surface of a body of water, whereby a constant circulation of fresh air may be provided through the natural breathing process of the wearer when submerged.

I accomplish these and other objects by means of the improved device disclosed in the drawing forming a part of the present application wherein like characters of reference are used to designate similar parts throughout the specification and drawing, and in which—

Fig. 1 is a view of the head of an operator, or wearer, disclosing my device in vertical section applied thereto, the float being disconnected from the breathing tubes;

Fig. 2 is a broken view of the device removed from the person; and

Fig. 3 is a diagrammatic view disclosing the device in use.

Referring to the drawing, the numeral 1 is used to designate a housing having an opening provided with resilient pneumatic cushioned edges 2, said edges 2 being shaped to conform generally to the face of a person, and said opening being arranged to enclose the nostrils and mouth of a wearer, as disclosed in Fig. 1 of the drawing.

The housing 1 is also provided with preferably a pair of inlet ports 3, each provided with a suitable flap-valve 4, and an exhaust or outlet port 6 similarly provided with a flap-valve 7. A pair of tubes 8 are provided for air passages between the interior of said housing and the atmosphere above the surface of water within which the wearer may be submerged. One of said tubes may be bifurcated, as disclosed in Fig. 2 of the drawing, both branches leading to the inlet ports 3.

One end of each tube is connected to the interior of the housing 1 by means of the inlet and exhaust ports above described, while the opposite ends of said tubes 8 are connected, preferably upon opposite sides, of a suitable float 9, said float being preferably elongated, and engaging said tubes 8 adjacent the ends thereof whereby the weight of said tubes will serve to maintain said float in an upright position, when in the water, and consequently the open ends of said tubes 8 will be normally projected above the surface of said body of water and into fresh air.

A suitable band 11 is used to normally secure and maintain the housing 1 in operative position upon the face of a wearer and embracing the mouth and nostrils, as disclosed in Fig. 1 of the drawing. As the manner of attaching said band 11 to said housing 1 forms no part of the present invention it is not specifically shown.

As disclosed in Fig. 1 of the drawing, the valves 4 and 7 are arranged, relatively to their respective ports, to permit passage in one direction only through said ports and consequently a passage of air through the tubes 8 and housing 1 in one direction only is permitted. By means of this novel arrangement a circulation of fresh air is permitted the wearer when submerged.

In operation, the housing 1 is applied to

the face of the wearer so that the opening therein will embrace and enclose the nostrils and mouth of said wearer, and held in such position by the preferably resilient or flexible band 11.

When the person is submerged, the weight of the tubes 8 will move the elongated float 11 to a substantially vertical position as disclosed in Fig. 3 of the drawing, and thereby project the free or open ends of the tubes 8 above the surface of the body of water within which said wearer may be submerged.

As the normal or natural process of breathing is carried on by the wearer, and inhalation will unseat the flapper-valves 4 of the inlet ports 3 and fresh air will be drawn from above the surface of the water through the tube 8 connected to said inlet ports 3 and into the lungs of the wearer, the same action operating to close the flapper-valve 7 on the outer side of the housing 1 over the exhaust port 6.

When the wearer exhales, the pressure thus produced will tend to close more tightly the normally closed inlet valves 4 and open the exhaust flapper-valve 7 over the outlet or exhaust port 6 and expel the air of said exhalation through the proper tube 8 and into the atmosphere above the body of water.

As the process of respiration is continued, it is apparent that a constant circulation of fresh air will be maintained, in one direction only, through the tubes 8 and housing 1, by the natural breathing process of the wearer.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is—

A breathing apparatus comprising a housing having an opening provided with resilient pneumatic cushion edges to snugly embrace the face and enclose the nostrils and mouth of a wearer; means for holding said housing in operative position; a pair of air tubes, each having one end connected to the interior of said housing to provide air passages; an elongated float mounted adjacent to and between the ends of said tubes remote from the mask to normally retain said ends projected in a substantially vertical position above the surface of a body of water within which said wearer may be submerged, whereby air may be supplied through said tubes to said wearer when submerged, by the natural breathing process; and suitable valves interposed between the submerged ends of said tubes and the interior of said housing and arranged to permit passage of air in opposite directions only through said tubes whereby a circulation of air in one direction only may be maintained through said tubes by the natural breathing process of said wearer.

In witness whereof, I hereunto set my signature.

JOSEPH L. BELCHER.