April 20, 1943. C. H. WILEN ET AL 2,317,236

BREATHING APPARATUS FOR SWIMMERS

Filed March 29, 1940 2 Sheets-Sheet 1

Fig. 1

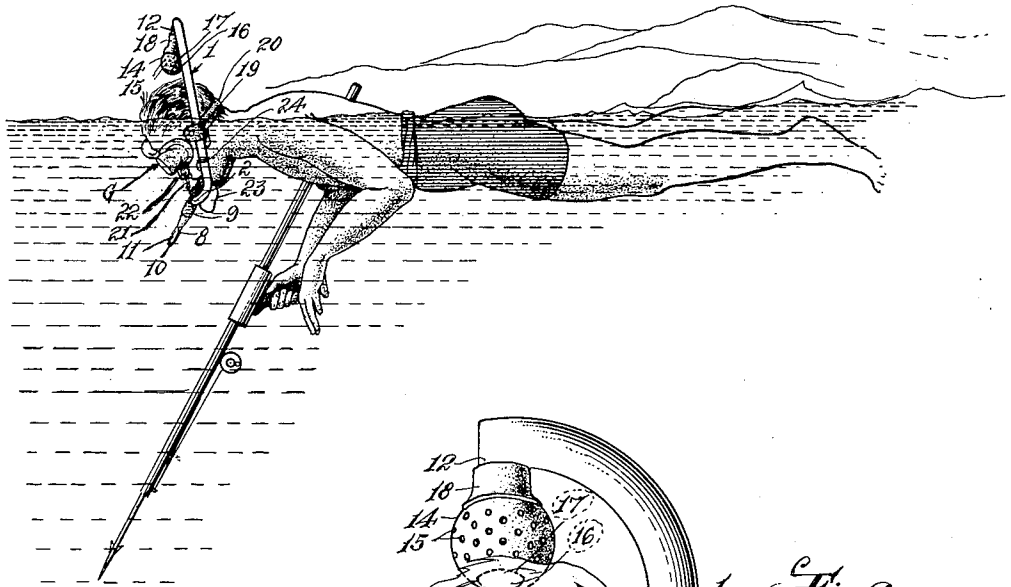


Fig. 2

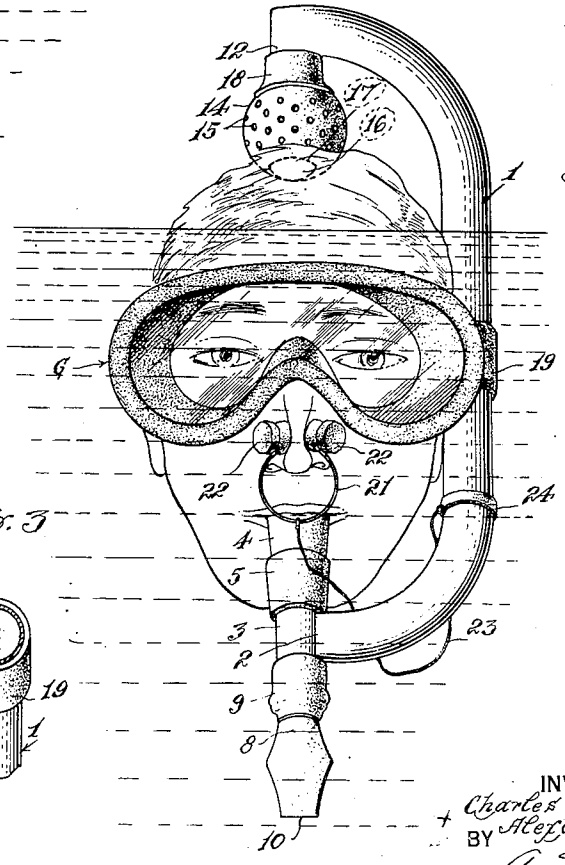
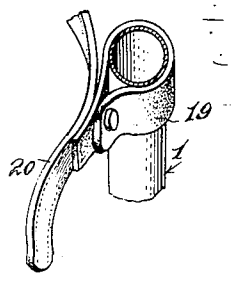


Fig. 3



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Filed March 29, 1940 2 Sheets-Sheet 2

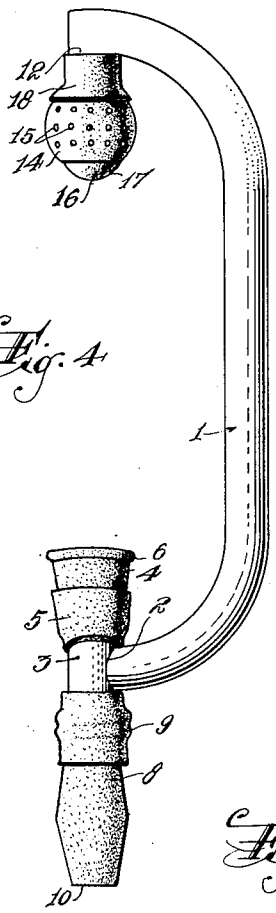

Fig. 4

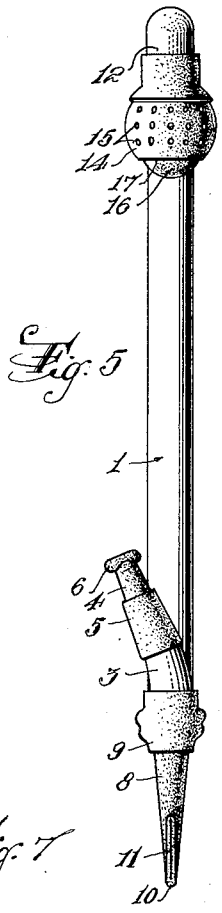

Fig. 5

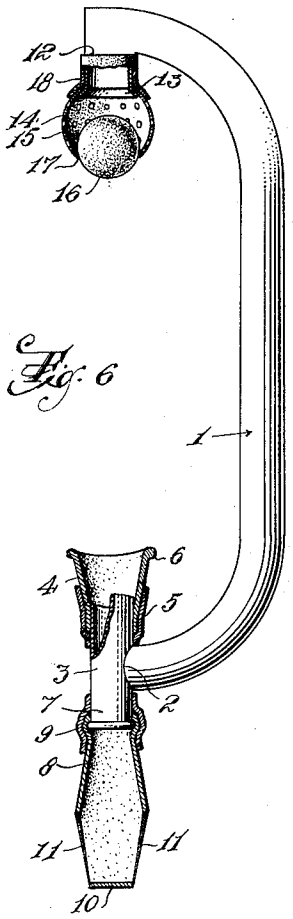

Fig. 6

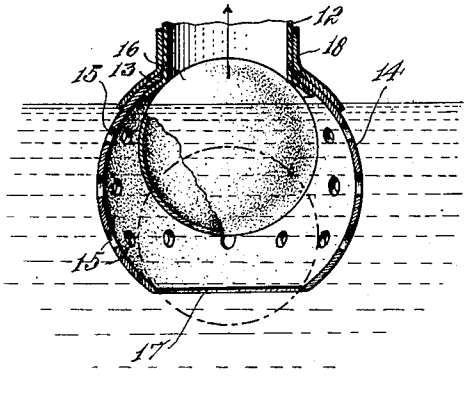

Fig. 7

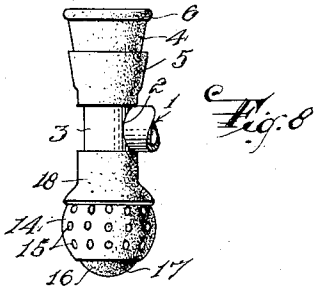

Fig. 8

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UNITED STATES PATENT OFFICE

2,317,236

BREATHING APPARATUS FOR SWIMMERS

Charles H. Wilen and Alexandre Kramarenko, Nice, France; vested in the Alien Property Custodian

Application March 29, 1940, Serial No. 326,684
In France December 22, 1939

4 Claims. (Cl. 9—20)

This invention relates to a breathing apparatus for permitting a swimmer to breathe when at least his face is below the surface of the water.

In our U. S. Patent 2,182,104, issued December 5, 1939, we have shown and described a type of goggles which we have found very satisfactory for under-water swimming, and especially for under-water shooting of fish. When engaged in this sport of under-water fish-shooting, the swimmer may have his eyes on a fish but is required to come up to the surface for air, and if he is obliged to completely emerge his head from the water he loses the visual contact with the fish, and this is not easy to pick up again after being above the water, as he must, for a considerable number of seconds.

It is the principal object of our invention to provide an apparatus which will allow a swimmer to come up to the surface for air and yet allow him to keep at least his face under water for an indefinite period, so that the line of vision established while at considerable depth below the water is not interrupted.

Other and ancillary objects will appear from a reading of the following specification taken in connection with the annexed drawings, wherein:

Figure 1 is a view of the swimmer at the surface of the water having the goggles of our patent in use, as well as the apparatus of our present invention, together with a gun invented by one of the present applicants, Kramarenko.

Figure 2 is a front view of the face of the swimmer with our breathing apparatus in operative position.

Figure 3 is a perspective view of a detail showing how the breathing apparatus may be attached to a part of the goggles.

Figure 4 is a side elevation of the breathing apparatus.

Figure 5 is a view of Figure 4 looking from left to right.

Figure 6 is a view similar to Figure 4, but with certain parts shown in section.

Figure 7 is a section of the valve shown at the upper portion of Figure 4.

Figure 8 is a view of the lower portion of the device shown in Figure 4, but with a valve similar to that shown at the upper part of Figure 4.

In the various views, wherein like numbers refer to corresponding parts, the breathing apparatus includes a tube 1 of any satisfactory material which is preferably light and may, therefore, be of aluminium. One end 2 of the tube 1 terminates in a T-shape formation. One arm 3 of the T has a mouthpiece 4 fastened thereto either directly or through the medium of a gripping collar 5. Both the mouthpiece 4 and the collar 5 are preferably made of compressible material, such as soft rubber, and the edge of the mouthpiece 4 is preferably formed with a rim 6 to give the swimmer a good grip over the mouthpiece. The other arm 7 of the T has a flap-type of valve 8 fastened thereto either directly or through the aid of a rubber collar 9. As shown in Figures 4, 5 and 6, the valve 8 is preferably of soft rubber and terminates in two relatively flat portions having their ends vulcanized together at 10 so as to leave oppositely disposed openings 11.

The upper end of the tube 1 has downwardly extending portion 12 terminating in flanged seat 13. Fitting over the flange 13 is a cap or container 14 preferably of soft rubber, vulcanized to a desired degree of hardness and having holes 15 therein to allow the water to circulate freely within the cap 14. Positioned within the cap 14 is a light ball-valve 16 which may be made of cork, sponge rubber or an inflated, soft, rubber ball. The cap 14 has an opening 17 opposite the valve-seat 13 to further allow water to move freely into and out of the cap 14, but this opening 17 is smaller than the diameter of the ball 16. If necessary, a soft, rubber grommet 18 may be used to assist in holding the cap 14 in position on the end 12 of the tube 1.

The device just described is adapted to be attached to the head of the swimmer in any satisfactory manner, one such being by means of a clamp 19 which may be fastened in any satisfactory manner to the band 20 which is used to hold the goggles G in position on the swimmer's head. When the apparatus is positioned as shown in Figures 1 and 2, it will be seen that when the swimmer's head is substantially under water, the air-intake and outlet valve at the top of the tube 1 will be out of the water. The swimmer breathes through his mouth, inhales and exhales the air from his lungs through the valve at the top of tube 1. Any saliva, or water shipped accidentally may be purged through the openings 11 in the exit valve 8.

There are two ways to purge the apparatus of saliva thru the bottom valve. One is to close the top valve by pressing by hand against the ball, and blowing into the mouthpiece. This extra air pressure causes the bottom valve to open and allows the saliva to be expelled, without emerging the face. The other is to raise the head out of the water, thus releasing the water pressure on

the lower valve which then automatically voids itself.

To further insure that the swimmer will not attempt to breathe through his nose, a nose-clip may be used as shown in Figure 2. This clip is made up of a spring member 21 and a pair of soft, rubber gripping pads 22 which are attached to the ends of the spring 21, which in turn is serviceably fastened through a cord 23 to the tube 1 as by a band 24.

When the swimmer, equipped with the goggles and breathing apparatus, and with or without the gun, dives under water, the ball-valve 16 immediately engages its seat on the flange 13 and prevents any water from coming into the tube 1. Likewise, the flap-valve openings 11, or the ball-valve 16 of Figure 8, stay closed by the pressure of the water. On coming to the surface, as indicated in Figure 1, the upper valve 16 will immediately open and allow the swimmer to breathe without allowing the goggles to come above the surface of the water and thus enable the swimmer to keep his line of vision intact, and the swimmer does not have to refocus his eyes on the fish or any object which he may have sighted before being obliged to come up for air.

To better position the breathing apparatus on the head of the swimmer, we have found that it is preferable to slightly offset the arms 3 carrying the mouthpiece 6. We have also found that a valve similar to the air intake-valve may be used as a saliva and water purging valve, as shown in Figure 8. Other changes in the details such as the introduction of a one way air-valve in tube 1 slightly above end 2 to permit of the inspiration of air thru the upper valve and expiration of air as well as purging of saliva and water thru the lower valve, may be made without departing from the spirit of our invention or the scope of the appended claims.

What we claim is:

1. A breathing apparatus for a swimmer engaged in under-water shooting of fish, comprising a rigid tube having a downward turn at one end and an automatic air-intake and outlet valve at the free end of the turn, the opposite end of the tube terminating in a T with a mouthpiece to go into the swimmer's mouth for breathing at one end of the arm of the T and a single saliva and water purging-valve at the opposite end of the arm of the T, the tube extending outwardly from the T and upwardly in close vicinity to the swimmer's ear, with means for fastening the tube to the head of the swimmer, the tube being of a length so the first-mentioned valve projects a distance above the water and above the head of the swimmer when the mouthpiece is in the swimmer's mouth and at least the entire face portion of his head is submerged.

2. A breathing apparatus for a swimmer engaged in under-water shooting of fish and provided with water goggles, comprising a rigid but light-weight tube having one end bent over at one end and carrying a perforated cap, a light, ball-valve carried within the cap and adapted to close the opening from the cap to the tube when lifted by action of water, the opposite end of the tube ending in a T formation, the arm of the T having a mouthpiece to go into the swimmer's mouth for breathing at the end nearest said cap and a valve at the end opposite the mouthpiece, and means for fastening the tube to the goggles of the swimmer, the tube being long enough so the cap and ball-valve are above the head of the swimmer and out of the water and in the air when the mouthpiece is in the swimmer's mouth and his entire face is fully under the water.

3. A breathing apparatus especially useful for a swimmer using a gun for shooting fish under water, said apparatus comprising under-water goggles to automatically fit over the eyes of the swimmer, a mouthpiece adapted to be taken into the swimmer's mouth, a light, rigid tube carrying the mouthpiece and curved so as not to interfere with the swimmer's vision and so as to extend upwardly alongside an ear of the swimmer and supported by the goggles and extending a distance above the top of the head of the swimmer, an air-valve at this upper end of the tube adapted to close when the valve encounters the water, and a valve adjacent the mouthpiece normally closed when under the water but adapted to be forced open by pressure coming from the swimmer's mouth, when the valve at the upper end of the tube is closed by hand.

4. A breathing apparatus for the purpose described comprising a tube terminating at one end in a T, a mouthpiece for entry into the mouth of the swimmer and fastened to one arm of the T and a valve structure fastened to the other arm of the T, this valve being closed by the water but adapted to be opened when the water pressure is removed, the other end of the tube extending beyond the swimmer's head and having a downwardly extending portion terminating in a valve, both of said valves being alike, each having a seat and comprising a circular perforated cap with an open end and carrying a light, rubber ball within, the ball being larger in diameter than the open end of the cap and adapted to be forced against its seat by the water when the swimmer goes under the water.

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