

Sept. 22, 1931.

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1,824,512

DIVING APPARATUS

Filed Oct. 4, 1930

2 Sheets-Sheet 1

Fig. 1.

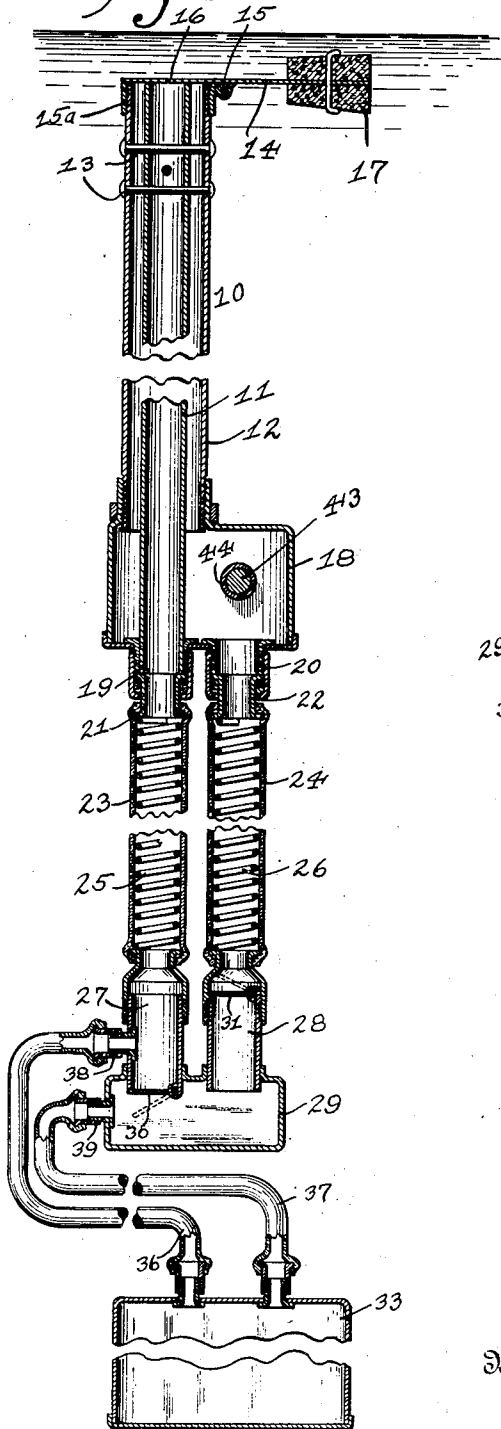
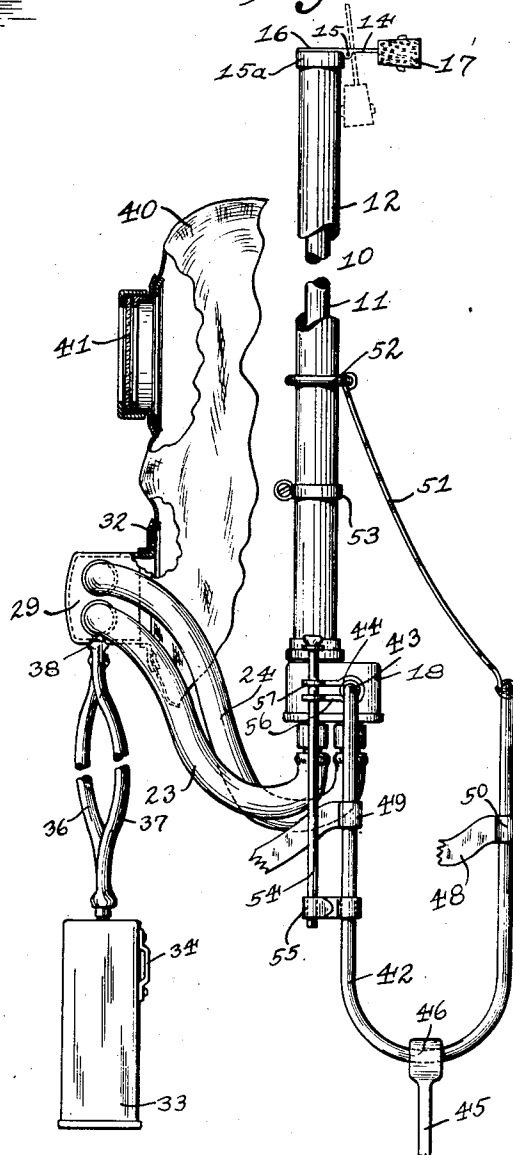


Fig. 2.



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Fig. 3.

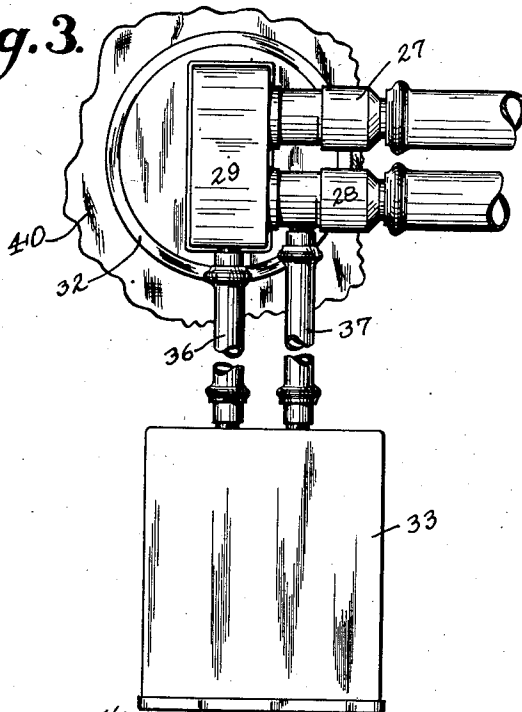


Fig. 4.

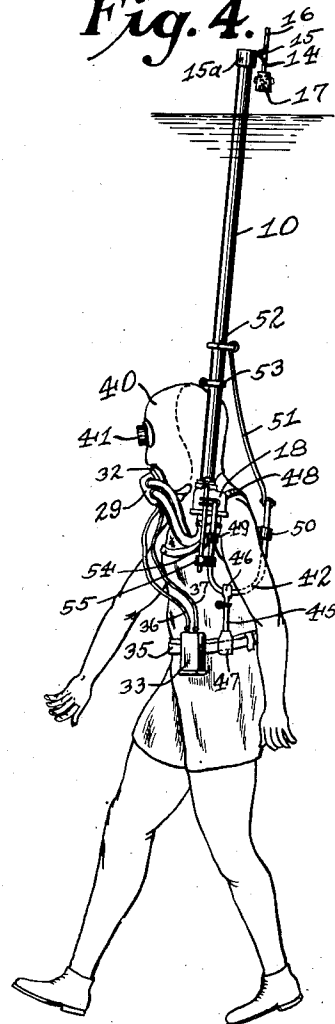
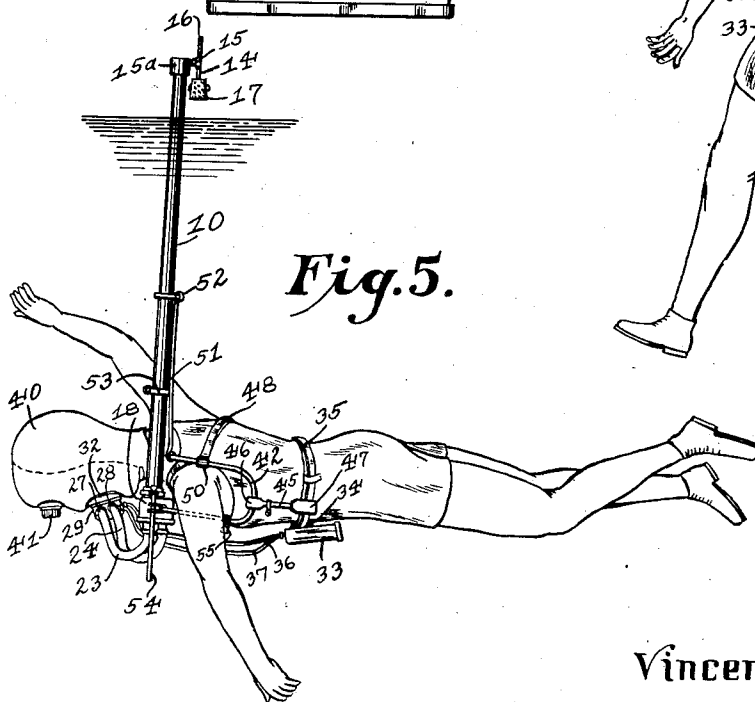


Fig. 5.



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DIVING APPARATUS

Application filed October 4, 1930. Serial No. 486,369.

This invention relates to diving apparatus, and more particularly to a diving gear adapted to be worn by a diver for use in relatively shallow water where an expensive, heavy, deep-water diving suit would be impracticable.

One object of this invention is to provide a diving apparatus of the above nature in which no float is needed to maintain the upper end of the air tube above the surface of the water, the entire apparatus being carried by the diver.

A further object is to provide an apparatus of the above nature having a rigid air tube which is adapted to remain vertical irrespective of whether the submerged diver is walking in an erect position or is lying or swimming horizontally.

A further object is to provide a diving apparatus of the above nature having safety means for preventing water from entering the top of the air tube in case the latter should become accidentally submerged.

A further object is to provide a diving apparatus of the above nature having a drip receptacle connected to the mouthpiece for receiving condensed moisture from the diver's breath and any water which may leak into the apparatus.

A further object is to provide a diving apparatus of the above nature which will be simple in construction, inexpensive to manufacture, easy to install and manipulate, compact, and very efficient and durable in use.

With these and other objects in view there has been illustrated on the accompanying drawings one form in which the invention may be conveniently embodied in practice.

In the drawings:

Fig. 1 represents a vertical sectional view of the improved diving apparatus.

Fig. 2 is a side view of the same, partly in section, and partly broken away.

Fig. 3 is a front view of the mouthpiece and the drip receptacle.

Fig. 4 is a side view, on a reduced scale, of the diving apparatus as it appears when worn by the submerged diver in an erect "walking" position.

Fig. 5 is a view similar to Fig. 4 showing the appearance of the apparatus when the submerged diver is in a horizontal "swimming" position.

Referring now to the drawings in which like reference numerals denote corresponding parts throughout the several views, the numeral 10 indicates generally a rigid air tube which is adapted to remain vertical at all times. The air tube 10 comprises a pair of concentric pipes 11 and 12 connected at their upper ends as by rivets 13, as shown in Fig. 1. The pipe 11 serves as an intake for a supply of fresh air from above the surface of the water, while the annular space between the pipes 10 and 11 serves as an exhaust passage for the air exhaled from the diver.

In order to cause the top of the tube 10 to be automatically closed in case the latter is accidentally submerged, provision is made of a safety valve comprising a lever 14 pivoted on a horizontal pin 15 mounted in a collar 15a at the top of the outer tube 12, the inner end of said lever 14 having a circular closure member 16 adapted to fit over the end of the tube 10, the outer end of said lever 14 being provided with a float 17 formed of any suitable material which is lighter than water, such as cork.

The pipe 12 is connected at its bottom, as by screw threads, to the upper part of an intermediate chamber 18, which is adapted to surround the inner intake pipe 11. The chamber 18 has a pair of depending rigid nipples 19 and 20 for receiving flexible coupling members 21 and 22, the latter in turn being adapted to detachably receive a pair of flexible tubes 23 and 24, such as rubber, having interior coiled springs 25 and 26 to prevent collapsing of said tubes under the water pressure. The outer extremities of the flexible tubes 23 and 24 are adapted to detachably fit over a pair of lateral pipes 27 and 28 extending from the side of a helmet chamber 29 which is preferably rectangular in shape, as shown in Fig. 3.

The inner end of the pipe 27 is located within the helmet chamber and is provided with a pivoted check valve disc 30 adapted to

open inwardly into said helmet chamber for freely admitting fresh air thereinto when the diver inhales. The pipe 28 is similarly provided adjacent its outer end with an outwardly-opening pivoted check valve disc 31 adapted to open when the diver is ex-
 5 31 adapted to open when the diver is ex-
 10 fresh and exhaled air will be possible.

In order to collect any moisture which may condense from the diver's breath within a circular mouthpiece 32, or water which may leak into the air tubes or helmet cham-
 15 ber 29, provision is made of a drip recep-
 20 tacle 33, preferably rectangular in shape and having a pair of rigid strap members 34 adapted to fit over the diver's belt 35. The drip receptacle 33 is connected, as by
 25 flexible hose pipes 36 and 37 to short pipes 38 and 39 depending from the lateral in-
 30 take pipe 27 and the bottom of the helmet chamber 29, respectively, as viewed in Figs. 2 and 3.

The mouthpiece 32 is adapted to be joined by any suitable air-tight connection to a flexible helmet 40 constructed of any
 35 suitable sheet material shaped to fit around the head of the diver. A pair of windows
 40 41 are provided in the upper forward portion of said helmet 40 in front of the position of the diver's eyes.

In order to support the diving gear upon the diver's body, provision is made of a
 35 U-shaped rod 42 adapted to be passed under the left arm of the diver immediately below the shoulder and supported in position with the arms vertical. The upper inner arm of
 40 the rod 42 is bent over at 43 and journaled in a horizontal tube 44 mounted in the interior of the intermediate chamber 18. By means of this construction, the tube 10 and the apparatus associated therewith is per-
 45 mitted to pivot with respect to the U-shaped rod 42 when the diver desires to change from erect to prone position, or vice versa.

The U-shaped rod 42 is adapted to be fastened to the belt 35 of the diver as by a
 50 strap 45 connected to the curved base of said rod and said belt by looped extremities 46 and 47, respectively. The rod 42 is also attached to the diver by means of a strap
 55 48 which encircles about three-quarters of the diver's body, and is likewise provided with end loops 49 and 50 fitted over the arms of said rod 42.

The rear end of the U-shaped rod 42 is connected by a thin resilient metal strip 51
 60 to a collar member 52 slidable on the outside of the pipe 12. The strip 51 serves to prevent the tube 10 from tipping out of vertical position when the diver is lying or swimming in the horizontal position shown
 65 in Fig. 5. An adjustable fixed collar 53

is also located on the tube 12 below the slidable collar 51 to limit the downward motion of the latter.

In order to hold the air tube 10 vertical when the diver is standing erect or walking 70 in a vertical position, provision is made of a vertical rod 54 detachably connected as by a clip member 55 to the inner arm of the U-shaped rod 42 and by a strip 56 to a collar member 57 on the lower end of the
 75 pipe 12.

Operation

In operation, when the diver wishes to go beneath the surface of the water in an erect or vertical position, he will first attach the
 80 apparatus upon his body in the position shown in Fig. 4 with the lower extremity of the rod 54 engaged in the clip 55. If he desires to lie or swim in a horizontal position,
 85 it will be merely necessary for him to disengage the rod 54 from the clip 55 and bend his body down from the position shown in Fig. 4 to that shown in Fig. 5, the air tube
 90 10 being maintained in a vertical position at all times.

In case the air tube 10 should accidentally become submerged, it will be understood that the float 17 will automatically swing
 95 from the dotted to the full line position shown in Fig. 2 closing the tube 10 and pre-
 100 venting water from entering therein. The diver will then immediately elevate himself until the upper end of the tube is again above the water surface, whereupon the safety valve on the air tube will open and
 105 permit the diver to continue breathing.

While there has been disclosed in this specification one form in which the inven-
 110 tion may be embodied, it is to be understood that this form is shown for the purpose of illustration only, and that the inven-
 115 tion is not to be limited to the specific disclosure but may be modified and embodied in various other forms without departing from its spirit. In short, the inven-
 120 tion includes all the modifications and embodiments coming within the scope of the following claims.

Having thus fully described the invention, what is claimed as new and for which
 125 it is desired to secure Letters Patent is:

1. In a diving apparatus, a helmet, a vertical rigid tube for supplying air to said helmet, a flexible connection between the
 130 bottom of said tube and said helmet to permit the diver to stand erect or lie in a horizontal position beneath the surface of the water, and means for attaching the lower
 135 end of said tube to said diver for permitting him to carry it about.

2. In a diving apparatus for use in relatively shallow water, a helmet, a vertical rigid tube adapted to extend above the sur-
 140 face for supplying air to said helmet, means for automatically closing the top of said
 145

tube if it should accidentally move under the surface of the water and thereby prevent water from entering said helmet, and means for attaching the lower end of said tube to said diver for permitting him to carry it about.

3. In a diving apparatus, a helmet, a vertical rigid portable tube for supplying air to said helmet, a flexible connection between the bottom of said tube and said helmet to permit the diver to stand erect or lie in a horizontal position beneath the surface of the water, means to permit exhaled air to be exhausted from said helmet, and means for attaching the lower end of said tube to said diver for permitting him to carry it about.

4. In a diving apparatus for use in relatively shallow water, a helmet, a vertical rigid portable tube for supplying air to said helmet, means for automatically closing the top of said tube if it should accidentally move under the surface of the water and thereby prevent water from entering said helmet, means to permit exhaled air to be exhausted from said helmet, and means for attaching the lower end of said tube to said diver for permitting him to carry it about.

5. In a diving apparatus, a helmet, a vertical rigid portable tube for supplying air to said helmet, and a flexible connection between the bottom of said tube and said helmet to permit the diver to stand erect or lie in a horizontal position beneath the surface of the water, said tube comprising an interior air intake pipe and a concentric outer air exhaust pipe, and means for attaching said tube to said diver.

6. In a diving apparatus, a helmet, a vertical rigid portable tube for supplying air to said helmet, a flexible connection between the bottom of said tube and said helmet to permit the diver to stand erect or lie in a horizontal position beneath the surface of the water, an automatic valve mechanism to prevent admixture of the fresh and exhaled air, and means for attaching said tube to said diver.

7. In a diving apparatus, a helmet, a rigid vertical portable tube for supplying air to said helmet, a support secured to the body of the diver, said tube being pivoted at its lower end to said support whereby the diver may stand erect or lie horizontally without tipping the tube out of vertical position, said tube extending upwardly from said support to a point above the surface of the water.

8. In a diving apparatus, a helmet, a rigid vertical portable tube for supplying air to said helmet and adapted to extend above the water surface, a support secured to the body of the diver, said tube being pivoted at its lower end to said support whereby the diver may stand erect or lie horizontally without

tipping the tube out of vertical position, said support having means to detachably hold said tube vertically when the diver is in either a horizontal or vertical position.

9. In a diving apparatus, a helmet, a rigid vertical tube for supplying air to said helmet, a support secured to the body of the diver, said tube being pivoted at its lower end to said support whereby the diver may stand erect or lie horizontally without tipping the tube out of vertical position, said tube having a depending extension, and said support having a clip for detachably engaging said extension.

10. In a diving apparatus, a helmet, a rigid vertical portable tube to be carried by a diver for supplying air to said helmet and adapted to extend above the water surface, a U-shaped support secured to the body of the diver, said tube being pivoted at its lower end to said support whereby the diver may stand erect or lie horizontally without tipping the tube out of vertical position.

In testimony whereof, I have affixed my signature to this specification.

VINCENTY SZAMIER.