H. STELZNER.

DIVING APPARATUS.

APPLICATION FILED AUG. 22, 1912.

1,073,370.

Patented Sept. 16, 1913.

Fig. 1.

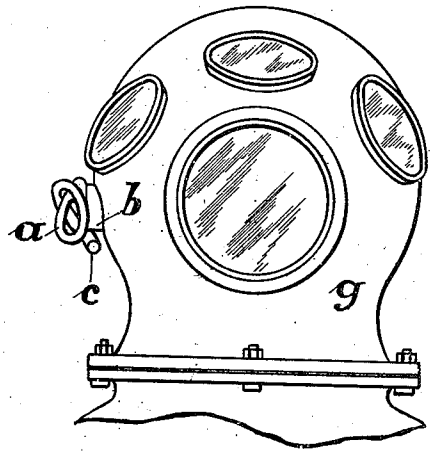


Fig. 4.

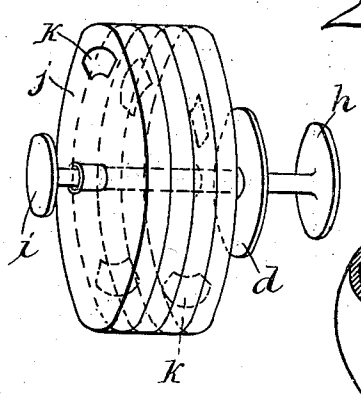


Fig. 2.

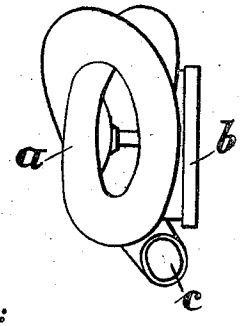
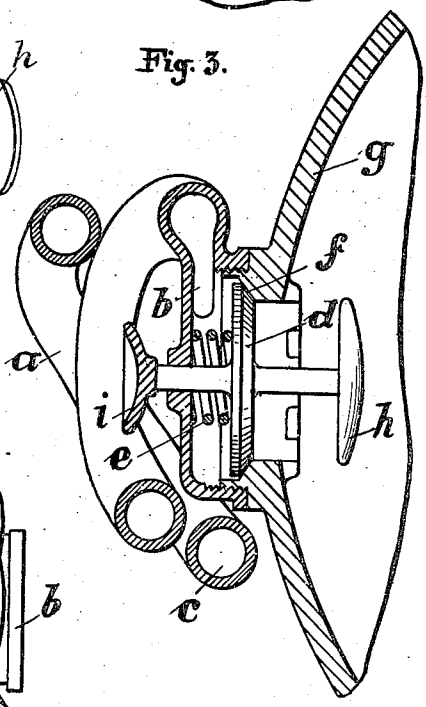


Fig. 3.



Witnesses:

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UNITED STATES PATENT OFFICE.

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DIVING APPARATUS.

1,073,370. Specification of Letters Patent. Patented Sept. 16, 1913.

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To all whom it may concern:

Be it known that I, HERMANN STELZNER, a subject of the Emperor of Germany, residing at 3 Uhlandstrasse, Lubeck, in the German Empire, have invented certain new and useful Improvements in Diving Apparatus, of which the following is a specification.

In diving apparatus it is of great importance to provide a safety valve at a readily accessible part of the dress, on the helmet for example. In particular it is necessary that upon leaving the water the expanded air may find an outlet in order to prevent the dress from bursting and other parts of the apparatus from being damaged. In the employment of simple non-return valves as safety valves it may, however, happen that in certain positions water will enter the dress through the valve and in some circumstances penetrate the breathing passages, air escaping simultaneously and water and air flowing past each other. In order to obviate this danger, in accordance with the present invention it is rendered impossible for air and water to flow past each other at the valve by providing a system of passages fitted externally to the valve opening, this system comprising passages bent in such a manner that in every position of the valve the water penetrating from the exterior invariably forms a water seal with the possibility of an air cushion forming above it. This renders it impossible for water entering to pass the air and enter the apparatus.

Figure 1 of the accompanying drawing represents the novel safety valve in accordance with the invention. Fig. 2 shows the addition to the safety valve separately in side elevation and Fig. 3 illustrates the valve in section. Fig. 4 is a detail view of a modified construction.

In the embodiment of the invention here illustrated the system of passages is constituted by a bent or coiled tube *a* one end of which opens into a cap *b* covering the valve opening while its other end *c* opens freely outward. As will be seen from the drawings the coil tube *a* is distorted or bent out of the path of the true helix, and thus no matter in what position the diver may be there is always an accumulation of the air expelled from the valve *d*. This accumulation of the air is caused by the formation of a water seal or seals within the tube *a*, and it prevents the ingress of any water to the valve *d*. Upon the valve body *d*, which is applied by the spring *e* against the seat *f* on the wall of the diver's helmet *g*, an inner press button *h* and an outer button or handle *i* are provided, so that the valve can be opened from the exterior or from the interior at will. The coiled tube *a* affords protection to the handle *i* which does not project so far and which is surrounded by the said tube thereby rendering it impossible for external objects to become caught on said handle.

Instead of being constituted by a coiled tube as illustrated at Figs. 1, 2 and 3, the system of passages can be constituted by a cap or box in which helical windings or plane partitions with staggered openings can be arranged. At Fig. 4 I have illustrated a series of partitions *j* through which are formed a number of openings *k* arranged in a staggered manner. These partitions *j* are placed within a suitable inclosing casing and the arrangement of the openings *k* therethrough causes the accumulation of air and the formation of a water seal or seals in the same manner as in the construction previously described.

What I claim and desire to secure by Letters Patent of the United States is:—

1. Diving apparatus having in combination a diver's helmet, a non-return valve mounted thereon, and means for preventing the outside water from entering the valve in all positions.

2. In diving apparatus the combination with a non-return valve, of a volute shaped system of tubes which are adapted in all positions of the apparatus to accumulate air expelled through the valve and to prevent the outside water from entering the valve.

3. Safety valve for diving apparatus comprising a non-return valve and a system of passages in the form of a helix one part of the helix being distorted or bent out of its natural path.

4. In a diving apparatus the combination with a non-return valve of a cap covering the valve opening and a volute-shaped system of tubes connected to the said cap.

5. In a diving apparatus, in combination, a diver's helmet, a non-return valve mounted on the said helmet, a cap covering the said

valve and a helical tube one end of which is free and the other end communicating with the said cap.

6. Diving apparatus having means for automatically reducing the pressure within the apparatus upon a reduction of the external pressure, said means comprising a non-return valve communicating with the interior of the apparatus, in combination with means for preventing the water passing to said valve in all positions of the apparatus.

7. Diving apparatus having means for reducing the air pressure within the apparatus upon a reduction of the external pressure, said means comprising a non-return valve, a valve seating, and resilient means to retain said valve upon its seating, means for opening said valve from the interior or exterior of the apparatus and means for preventing the passage of water to said valve in all positions of the apparatus.

In testimony whereof I affix my signature in presence of two witnesses.

HERMANN STELZNER.

Witnesses:
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