A. B. DRÄGER.

DIVING APPARATUS.

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1,131,490.

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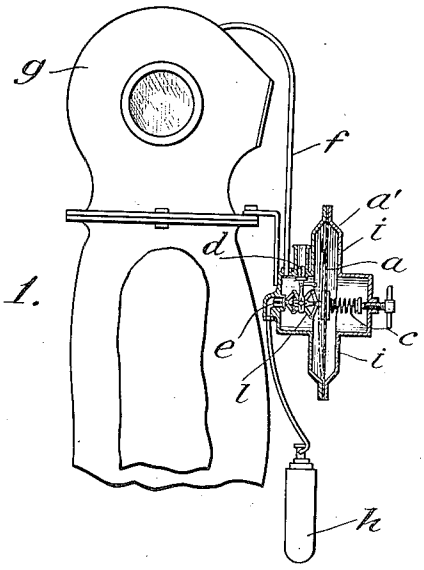


Fig. 1.

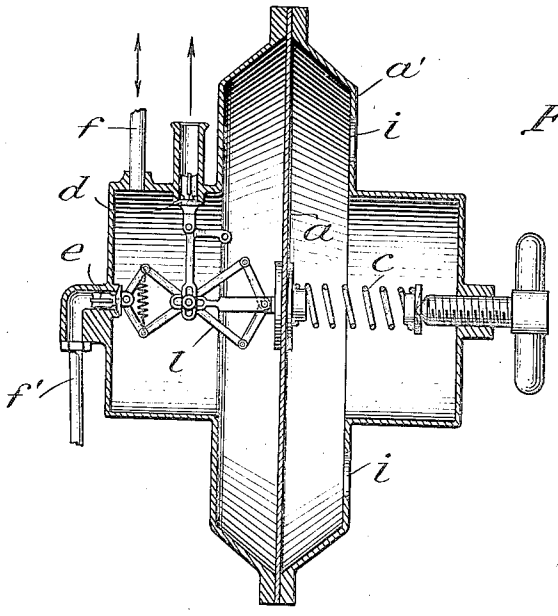


Fig. 2.

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DIVING APPARATUS.

1,131,490. Specification of Letters Patent. Patented Mar. 9, 1915.

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To all whom it may concern:

Be it known that I, ALEXANDER BERNHARD DRÄGER, a subject of the German Emperor, and resident of Lübeck, in the German Empire, have invented new and useful Improvements in Diving Apparatus, of which the following is a specification.

The present invention relates to diving apparatus or divers' dresses and more particular to means by which accidents can be avoided which happen by a sudden falling down of the diver into greater depth or by a sudden rise. When falling to a greater depth the column of water above the diver increases correspondingly, so that the dress is pressed together to a greater extent and the air within is driven or compressed into the helmet. It even happens that the diver himself is pressed into the helmet whereby his life is endangered. On a sudden rise the column of water decreases and the pressure of air within the dress having less counter pressure from outside causes an inflation and even has the tendency to burst the dress. It is very difficult and frequently impossible for the diver to find preventive measures to save himself.

According to the present invention means are provided for maintaining the necessary uniform space of air. At a certain height of the dress depending on the amount of air which is required within the dress, the yielding wall or part of the dress is connected with a valve or the like in such manner that on a change of pressure taking place it will be moved in that moment, in which the height of the water corresponding to the pressure of the inclosed buoyant air becomes greater or less than the first named height. This object can be obtained by means of a spring pressed member adapted to be moved by pressure and connected with a valve or the like controlling a pipe connecting the dress with an air reservoir, in such manner that, when said member is moved in surpassing the respective height of water column, the valve is opened and allows compressed air or gas to enter the dress. In a similar manner a second valve or the like may be connected with the dress to allow air to escape from the dress, when the same is inflated beyond the normal condition by an excessive inner pressure of air. The said yielding member spoken of above need not be a part of the dress proper but it is only necessary, that such member forms part of the surface inclosing the space of air filling the dress. Even the surface of water or other liquid may form part of the said wall as will be clearly understood from the description given below.

In the drawings: Figure 1 shows the upper part of a diver's dress provided with the device forming the subject matter of the invention. Fig. 2 is an enlarged vertical section of the device.

The wall forming part of the inclosing surface of the confined air is formed by a spring pressed diaphragm *a* arranged within the casing *a'* connected with the helmet *g* by a pipe *f*, on one side of the diaphragm. On the other side of the diaphragm the casing is provided with openings *i*, thus allowing the outer water pressure to take effect on the diaphragm. The diaphragm is connected by toggle levers *l* with a valve *e* closing a pipe *f'* which connects the casing *a'* with a reservoir *h*. When the water pressure increases by the diver falling to a greater depth, the diaphragm *a* is bulged out against the action of a spring *c* as shown in dotted lines and the valve *e* is opened to allow compressed air from the reservoir *h* to enter the space of the confined air, thus increasing the internal pressure and returning the outline of the collapsed dress to its former shape. When the water pressure falls the pressure of the confined air acts on the diaphragm whereby a vent valve *d* which is also connected with the toggle levers *l* is opened until the pressures are balanced again.

Evidently the new improvements can be employed on diving apparatus of different kinds for instance in diving sledges and other apparatus used for conveying divers under water as long as the elastic clothings are of such length in vertical direction, that the lowest part of the inflatable section of the clothing undergoes a perceptible change in ascending or descending.

I claim:

1. In a diving apparatus, the combination with a diving dress, of a casing connected to and communicating with the dress and having a yielding wall arranged to be subjected to hydraulic pressure, means to supply compressed air to the casing, and means

operable by the movement of the wall due to variation of hydraulic pressure thereon, to control the admission of air to the casing.

2. In a diving apparatus, the combination with a diving dress, of a casing carried by and communicating with the latter and having a flexible wall, a compressed air reservoir arranged to communicate with the chamber, a valve to control the admission of air to the latter, and means operated by variation of hydraulic pressure on the wall to open and close said valve.

3. In a diving apparatus, the combination with a diving-dress, of a casing connected to the dress and having an opening therein, a flexible diaphragm in the casing forming a closed chamber communicating with the dress, a compressed air reservoir arranged to communicate with the chamber, and a valve in the chamber operable by the diaphragm to control the admission of air to said chamber.

4. In a diving apparatus, the combination with a diving-dress, of a casing carried by the dress and having an opening to admit water to the casing, a flexible diaphragm in the latter forming a closed chamber communicating with the dress, a compressed air reservoir arranged to communicate with the chamber, a valve to control the admission of air to the chamber, a vent valve in the latter, and means operated by the diaphragm to open one valve and close the other.

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Witnesses:
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