

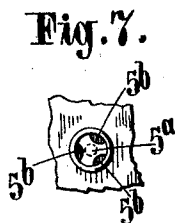
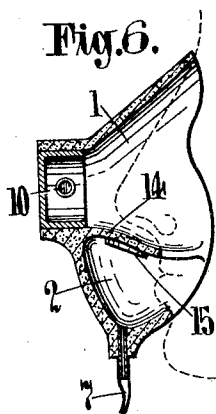
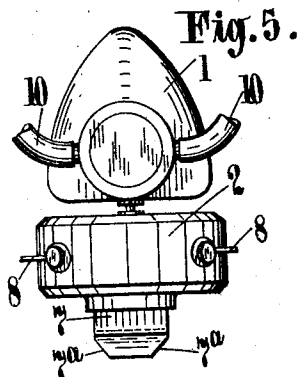
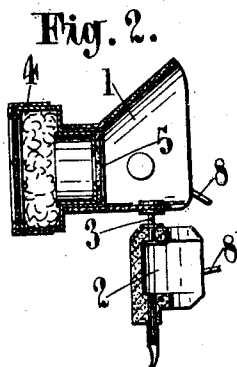
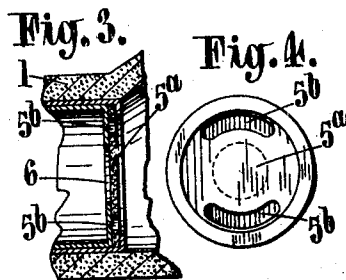
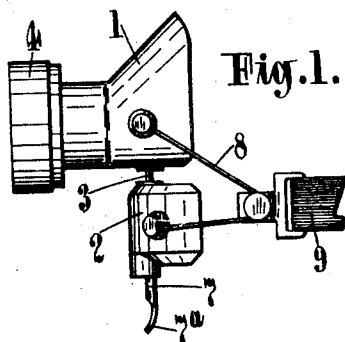
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RESPIRATOR

Filed March 5, 1926



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RESPIRATOR.

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My invention relates to respirators or inhalers which provide means for the supply of pure air to workers or operators who are obliged to work or remain in surroundings which prohibit natural forms of breathing or the conditions of which are such that pure air is not available. My invention is applicable to those simple forms of respirators in which air is inhaled through a filtering or purifying medium as well as the more elaborate forms in which pure air is forced by pressure to the interior of the mask or head-piece such as apparatus for diving or for entering burning buildings and the like.

In normal breathing without a mask or respirator the exhaled air is carried away and does not usually mix with the inhaled air, but in respirators as heretofore constructed with a chamber or passage immediately surrounding or leading to the nose and mouth with various arrangements of valves no satisfactory method has been provided for preventing the exhaled air, or some portion of it, from mixing with, and to some extent contaminating, the inhaled air.

In my invention I provide a simple and efficient method of overcoming this difficulty.

In carrying out my invention I provide two chambers either in the form of two separate pieces, an inhaler for the nose and an exhaler for the mouth, which may if desired be joined together by a suitable link or fastening, or in the form of two chambers within a single mask or like which are separated by a diaphragm, or partition, which passes horizontally between the nose and the mouth. This diaphragm may be made of rubber or any suitable material which can be made to conform to the contour of the face.

I permit air to be drawn or forced into the upper chamber, inhaled through the nostrils and exhaled through the mouth and the lower chamber. I accomplish this by means of a single arrangement of valves. I provide a valve for the lower chamber which prohibits the inflow of external air through the mouth and a valve for the inlet of air to the upper chamber so arranged as to prohibit the expiration of air there-through from the nostrils.

When the head piece or mask is worn and air is delivered to it under pressure the in-

take valve may be dispensed with and if suction is also provided for the outlet from the mouth both valves may be dispensed with.

By this means the wearer of the mask has only to keep his mouth open and inhale and exhale naturally, to take in fresh air through the nostrils and exhale through the mouth.

Incidentally by this system the exhaled air will not cause a deposit on the glasses for the eyes when these are incorporated with the respirator.

Several simple forms of the invention are illustrated by the accompanying drawings, wherein:—

Fig. 1 is a side elevation of a form incorporating a filter.

Fig. 2 is a sectional elevation of the same.

Figs. 3 and 4 are details of the intake valve.

Fig. 5 is a front elevation of a modified form arranged for the supply of chemically treated air or of compressed air from a container.

Fig. 6 is a section of a modification in which inhalation may be wholly or partly by the mouth as well as exhalation.

Fig. 7 shows a modified form of valve.

Referring first to Figs. 1 to 4 a separate inhaler 1 for the nose and exhaler 2 for the mouth are shown connected by a link 3. This link is preferably both flexible and adjustable as to length. It may, for example, in practice comprise two pieces one screwed into the other, with a hook and eye or like fastening at one end. Inhalation as shown takes place through a casing 4 which may contain cotton wool or filtering material of any sort or material for chemical treatment of the entering air. The air then passes through a non-return valve 5 shown to an enlarged scale at Figs. 3 and 4 and consisting of a rubber diaphragm having a central portion 5^a covering an aperture 6 and provided with openings 5^b for the inward passage of air. The exhaler is provided with a non-return valve 7 consisting of a flat rubber tube with diagonal openings 7^a near its closed end. Suitable cords 8 and elastic straps 9 secure the mask in position fitting closely upon the face of the wearer.

Referring next to Fig. 5 the mask is similar except that the casing 4 is dispensed with and air is drawn into the chamber 1 through flexible tubes 10 leading from a suitable container.

In the modification shown at Fig. 6 both chambers 1 and 2 are contained in a single mask and separated by a close-fitting horizontal partition 14. A valve 15 disposed in the partition enables the air entering chamber 1 to be wholly or partly drawn down into chamber 2 in case of any difficulty as to inhaling through the nose or preference for inhaling wholly or partly by the mouth. Even when inhalation is wholly by the mouth the disadvantage of condensation from the exhaled air around the nose and (where these are included in the mask) around the eyes and eyepieces is thus avoided. The valve 15 is shown at Fig. 7 and has

a slightly modified form of the rubber diaphragm.

I claim:—

A respirator having separated chambers to surround the nose and mouth of the wearer respectively, inlet means permitting entry of air into the chamber surrounding the nose, outlet means permitting exit of air from the chamber surrounding the mouth, and a non-return valve permitting air to pass from the chamber surrounding the nose into that surrounding the mouth.

In testimony whereof I affix my signature.

CHARLES LAURENCE BURDICK.