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GAS MASK FACE PIECE

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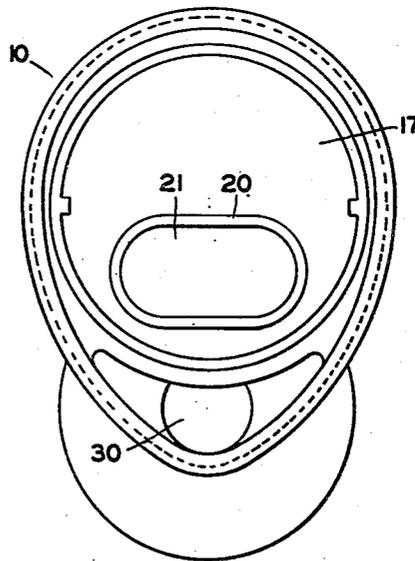
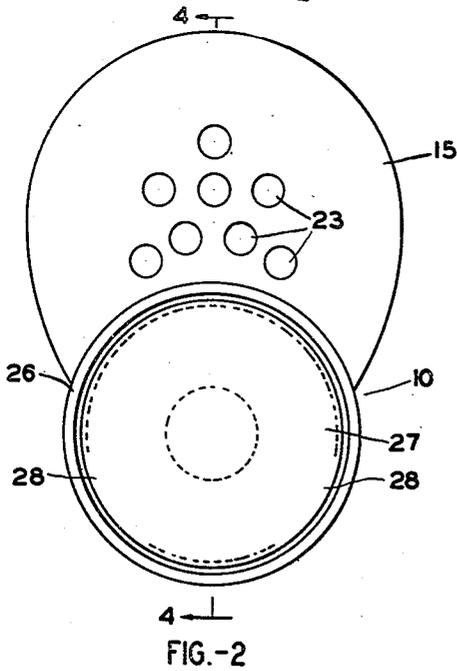
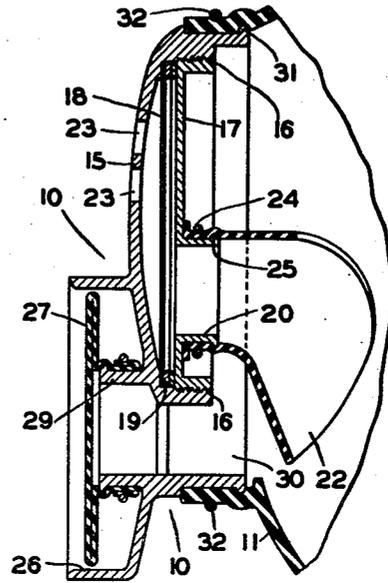
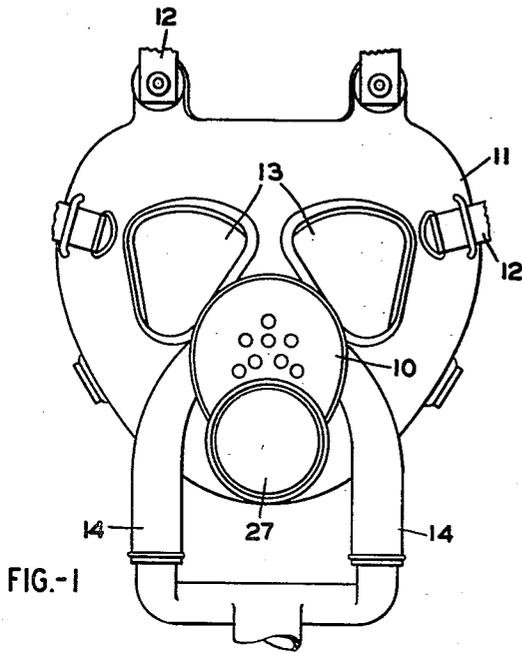


FIG.-3

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GAS MASK FACEPIECE

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4 Claims. (Cl. 128—141)

The invention relates to respiratory devices, generally termed gas masks, and more particularly, to face pieces for gas masks, a gas mask face piece being that portion of the mask which is arranged in general juxtaposition to the mouth and nose of the wearer.

A serviceable gas mask must include suitable means for supplying a breathable atmosphere from a convenient portable source. It must also include suitable valve means for permitting exhalation by the wearer, the exhalation valve being usually a one-way valve so as to prevent ingress of toxic vapors. For convenient general use, a serviceable mask should also include some means, impermeable to gases, for the transmission of speech vibrations therethrough. Gas masks have previously been known, and are at present available, which are equipped with means for performing such functions. These prior structures, however, are characterized by a number of serious disadvantages, among which might be mentioned intricacy of construction, multiplicity and complexity of parts, heavy weight and unbalanced assembly of components, and lack of protection for the exhalation valve or other exposed essential parts.

The general object of the present invention, therefore, is to avoid the foregoing and other disadvantages of prior gas masks by the provision of a novel and improved gas mask face piece, the nature and construction of which will hereinafter appear.

Another object is the provision of a gas mask face piece which includes, in an integrally formed structure, improved housing and protecting means for the exhalation valve and for the speech transmitter.

Another object is the provision of a gas mask face piece which is of light weight, and which is noncorrodible and resistant to shock and impact, as a result of its fabrication from suitable organic plastic materials by a pressure casting operation.

Other objects and advantages of the present invention will be apparent from the following description of one embodiment thereof, reference being had to the accompanying drawing, in which

Fig. 1 is a front elevation of an improved face piece forming part of a gas mask which is otherwise conventionally illustrated, the supporting straps and air supplying ducts being broken away;

Fig. 2 is a somewhat enlarged view of said face piece;

Fig. 3 is a view in elevation as seen from the rear of Fig. 2; and

Fig. 4 is a section taken on the line 4—4 of Fig. 2.

5 Before the present invention is described in detail, it is to be understood that such invention is not limited to the details of construction and/or the specific arrangement of parts herein illustrated and/or described, as the invention obviously may take other forms. It also is to be understood that the phraseology or terminology herein employed is for the purpose of description and not of limitation.

10 For purposes of illustration, the drawing shows a gas mask 11, having attaching straps 12, transparent vision windows 13, and inlet ducts 14 leading from a source of breathable atmosphere. The present invention is particularly concerned with the face piece 10 which is preferably fabricated from organic plastic material, such as cellulose acetate, by a pressure casting operation. In the embodiment shown, its contour is so simple that it can be cast integrally in a die wherein a molding cavity is defined between separable mold members in conventional fashion.

25 The face piece 10 includes an upper chambered housing 15 having a perforated front wall. The housing is preferably of cylindrical contour and internally threaded at 16 to permit the insertion therein of an annular disk 17 which is externally threaded to seat in the corresponding threads 16.

30 One or more flexible disk-like sheets, of cellulose acetate or other suitable material and which constitute a diaphragm 18, are disposed in housing 15, being retained therein in gas-tight relationship by means of resilient washers 19 which are maintained under compression by the retaining disk 17. Said disk carries an inwardly extending boss 20 having an opening 21 there-through for the transmission of speech, and a flexible hood 22 may be positioned over boss 20 to direct the air waves of audible frequency through aperture 21 and against diaphragm 18, whereby they are again transmitted through aperture 23 to persons in the vicinity. The diaphragm 18, although imperforate to block entrance of noxious gases, readily transmits audible frequencies. Any suitable means may be utilized for assuring retention of hood 22 on boss 20, such as a spring ring 24 or the like, or a rubber-like member may be stretched to pass over bead 25 and thereafter allowed to contract on the slightly reduced neck portion of the boss, as will be readily understood.

The face piece 10 also includes another recess, 20, which is designed to carry therein an exhalation valve. The principal purpose of recess 20 is to protect said valve from injury by abrasion such as might be experienced when the mask is in active use, or from perforation by flying missiles or otherwise. While a number of types of exhalation valves are available, the one widely known as a flutter valve is preferable, since it can be very conveniently housed in the outwardly opening recess 20. As is well known, such valve comprises two juxtaposed sheets of rubber-like material 27, which are sealed around a substantial portion of their periphery, but which are free to separate at one or more locations 28 to permit egress of a fluid current from the gas mask interior. A bored out boss portion 29 carries thereon the flutter valve in a manner similar to that whereby hood 22 is retained on boss 20 as already described, said boss 29 and said flutter valve being protectively housed within the outwardly extending walls of recess 26. The passage 30 in boss 29 extends through the face piece and its inner terminus is near the wearer's mouth and nostrils when the mask is in use.

Any suitable attaching method or means may be used for affixing the face piece to the pliable material (such as rubber or the like) of the gas mask. In the form shown, the gas mask material is snapped over a retaining bead 31 on the face piece rear portion, and an additional spring wire 32 or some other suitable tie means is applied in place on the reduced portion behind the bead.

Anyone who has experienced the inconvenience and discomfort occasioned by wearing the types of gas mask hitherto available cannot fail to appreciate the advantages afforded by the invention here involved. Both the speech transmitter and the exhalation valve are included in one compact unitary assembly, and by such arrangement, haphazard injury is reduced to a minimum. The plastic material of the face piece has a specific gravity which is lower than that of any commercially usable metal or alloy, and does not rust or corrode. The weight reduction which results not only from the low specific gravity of the material, but even more from the simplification of design and reduction of parts, greatly adds to the feeling of relief when a change is made from the older type mask to this improved type. It has been commonly observed that the civilian population shows widespread unwillingness to wear gas masks in times of stress mainly because of the inconvenience resulting chiefly from the weight of the gas mask and its complexity of construction and operation.

What I claim is:

1. In a respiratory device such as a gas mask or the like, a face piece comprising a one-piece member having two forwardly extending spaced inner and outer flanges of continuous form, the inner flange surrounding an opening in said member and adapted to have an exhalation valve secured thereto in communication with said

opening and the outer flange defining a recess within the confines of which said exhalation valve is housed, said member also having a rearwardly extending flange of continuous form for the securement thereto of the main part of the gas mask or like device, said member also having a rearwardly opening recess within the area defined by said rearwardly extending flange for the reception of speech-transmitting means, and a closure for said last mentioned recess removably secured to said member, said closure having an opening therethrough to establish communication with said last mentioned recess.

2. In a respiratory device such as a gas mask or the like, a face piece having an inwardly opening recess and an outwardly opening recess, one of said recesses being adapted to receive an exhalation valve and the other of said recesses being adapted to receive speech transmitting means, said recesses being in mutually overlapping relationship, a removable closure for said inwardly opening recess, said closure having an opening therethrough and also having an inwardly extending flange surrounding said opening and providing a passageway to said inwardly opening recess.

3. In a respiratory device such as a gas mask or the like, a face piece comprising a member having an outwardly extending flange of continuous form and also having an exhalation opening surrounded by said flange, said flange defining a forwardly opening recess for the housing of an exhalation valve for cooperation with said exhalation opening, said member also having an inwardly extending flange of continuous form for the securement thereto of the main part of the gas mask or like device, the area defined by said inwardly extending flange and said outwardly opening recess being in mutually overlapping relationship, said member also having an inwardly opening recess within the area defined by said inwardly extending flange for the reception of speech transmitting means.

4. In a respiratory device such as a gas mask or the like, a face piece having an inwardly extending continuous wall for the attachment of the main part of the gas mask thereabout, said face piece also having an inwardly extending flange which, with a portion of said wall, forms a laterally closed inwardly opening recess for the reception of speech transmitting means, said recess lying within the area defined by said continuous wall, said face piece having an outwardly convexed apertured portion constituting the front wall of said recess, said face piece having an exhalation opening therethrough within the area defined by said wall but outside of said recess, and said face piece also having an outwardly extending flange surrounding said exhalation opening and defining an outwardly opening recess for reception of an exhalation valve cooperable with said exhalation opening, said outwardly opening recess overlapping a part of the outwardly convex portion of the face piece.

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