

Feb. 10, 1948.

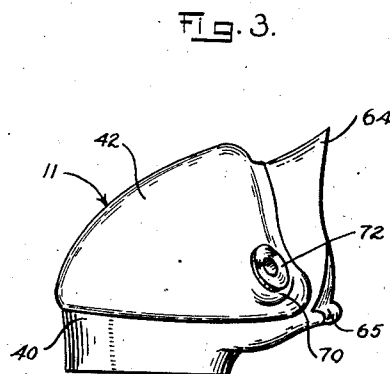
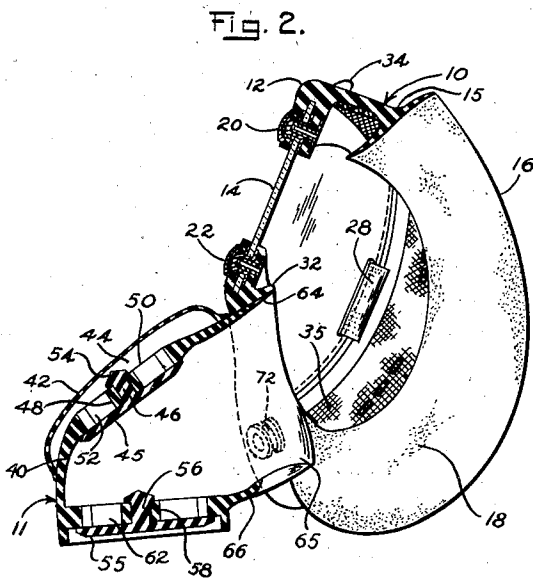
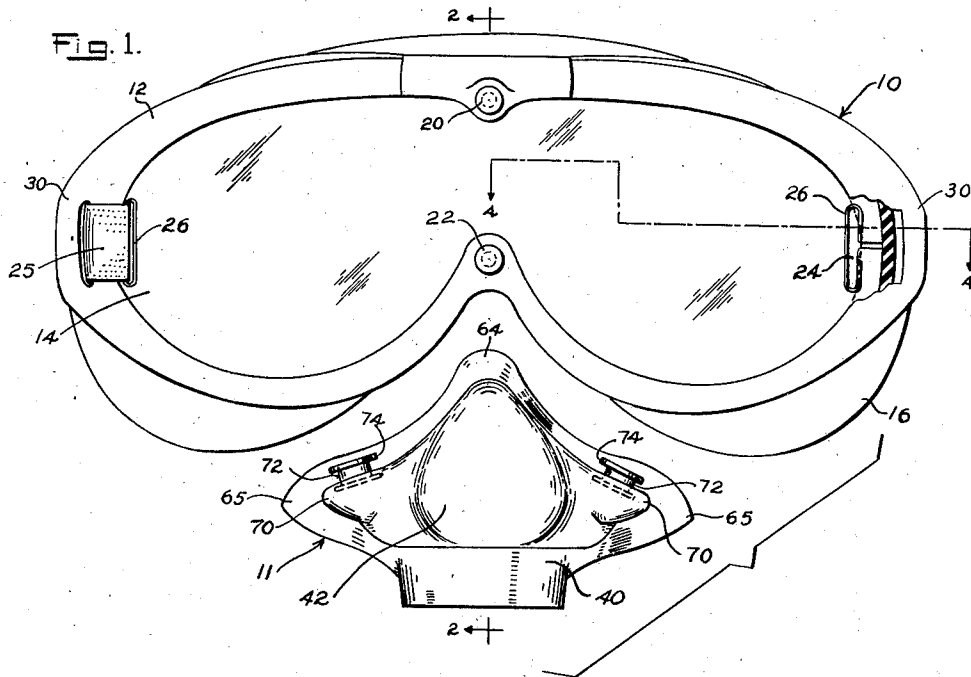
F. W. MAURER

2,435,653

GOGGLE

Filed Aug. 31, 1945

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 4.

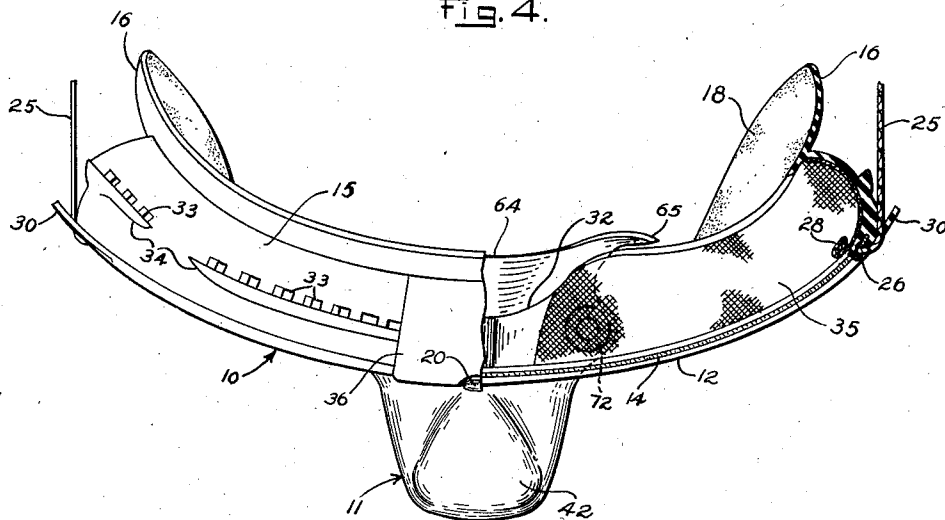


Fig. 5.

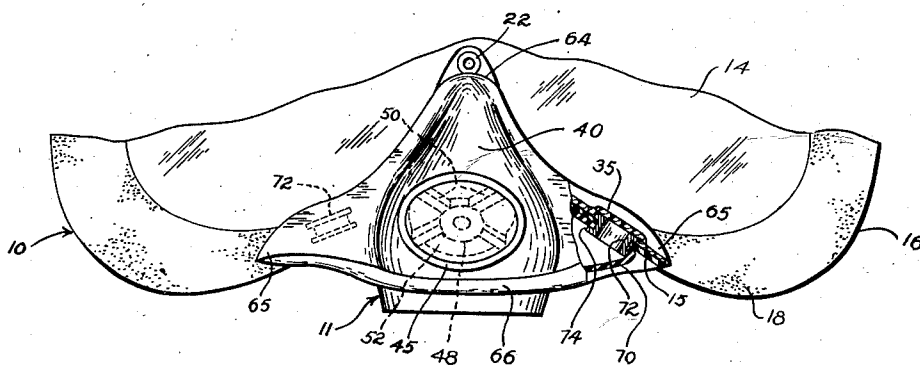
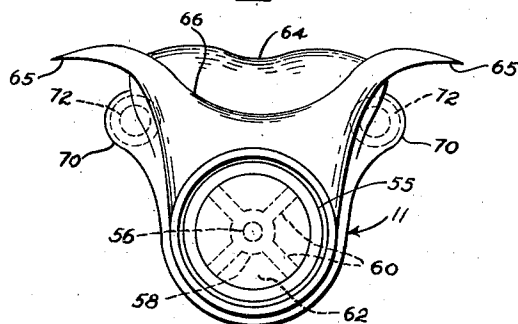


Fig. 6.



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GOGGLE

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Application August 31, 1945, Serial No. 613,911

10 Claims. (Cl. 128-141)

1

This invention relates to a new and improved goggle device particularly characterized by substantial freedom from fogging of the lens.

A primary object of the invention is to provide a goggle device comprising a main frame portion defining an eye chamber and a supplemental frame portion or nose piece connected to said main frame portion by means providing communication for air therebetween, and wherein the natural breathing of the wearer of said device provides forced ventilation of said eye chamber.

A more specific object is to provide a goggle device as outlined above incorporating valve means acting to permit air to pass through from said eye chamber to said nose piece but to prevent exhaled air from returning to said eye chamber.

A further object is to provide a goggle device as outlined above wherein said nose piece is detachable from said main frame portion without affecting the function or operation of said main frame portion.

Still further objects and advantages will in part appear and in part be pointed out in the course of the following detailed description of one or more embodiments of the invention, which are given as nonlimiting examples, in connection with the accompanying drawings, in which:

Figure 1 is a front elevation, partly exploded and partly broken away, showing a goggle embodying a form of the invention;

Figure 2 is a section taken substantially on the line 2-2 in Fig. 1 showing the parts in assembled position;

Figure 3 is a side view of the novel nose piece of the invention;

Figure 4 is a top view partly in section substantially on the line 4-4 in Fig. 1;

Figure 5 is a fragmentary rear view partly broken away; and

Figure 6 is a bottom view of the novel nose piece of the invention.

The goggle of the present invention comprises essentially a main goggle frame 10 providing the eye chamber and a supplemental frame or nose piece 11. Main frame 10 comprises a rim portion 12 holding lens 14, and a rearwardly extending portion 15 terminating in flange portion 16 which engages the face of the wearer. Frame 10 is preferably formed of natural or synthetic rubber or other resilient material, and flange 16 is therefore preferably stippled, lined with cham-
 18 for greater comfort. Lens 14 is preferably

2

formed of a transparent organic plastic, such for example as cellulose acetate, and may if desired have a dye or other selectively light-absorbing material incorporated therein. Lens 14 may be mounted in rim 12 in any convenient way; for example, it is shown as engaging in a slot within rim 12 and retained therein by means of snap fasteners 20 and 22 carried by the walls of said slot. At its outer ends, lens 14 is provided with slots 24 adapted to receive head straps 25. As is shown particularly in Figs. 1 and 4, slots 24 are preferably T-shaped to facilitate removal of straps 25 therefrom for exchanging lenses and may be reinforced by means of grommets 26. Straps 25 are provided with enlarged ends 28 to prevent withdrawal through slots 24 and are guided rearwardly by slotted lugs 30 at the ends of frame 10.

Goggle frame 10 is designed to be worn either with or without nose piece 11. It is accordingly formed at the nose-receiving portion with a rearwardly projecting flange portion 32 adapted to overlie and engage the nose of the wearer when nose piece 11 is not used. Ventilation of the eye chamber is provided by means of a series of apertures 33 in the top and sides of frame portion 15 located just behind sloping baffle members 34. The inner surface of frame portion 15 is preferably lined with felt 35 or any other suitable cloth material for filtering and diffusing air entering the eye chamber through ventilation ports 33. A particularly satisfactory material for this purpose is the cloth sold under the trade name "Duvatine." It is desirable to thicken frame portion 15 at 36 for purposes of reinforcement.

Nose piece 11 comprises a main body portion 40 defining a nose-receiving chamber and an outer layer or shield 42, which is secured to the outer surface of element 40. It is generally preferred to form elements 40 and 42 separately, as by molding from rubber or other suitable resilient material, and then secure them together as by any suitable adhesive along the periphery of shield 42. It will be noted that shield 42 is formed with a more or less domed shape in such manner that it is maintained in spaced relation with element 40 and thereby defines therewith a third or conduit chamber 44 overlying the nose chamber. Communication between chamber 44 and the nose chamber is provided and controlled by means of any suitable one-way valve assembly. For example, valve 45 of soft rubber or like material is mounted by means of valve stem 46 in central rim 48 and ribs 50 in the wall of element 40.

Valve 45 thereby permits air to pass from chamber 44 into the nose chamber through apertures 52 between ribs 50 but acts to prevent air from passing back through said apertures. An enlarged head 54 on valve stem 46 aids both in maintaining shield 42 in spaced relation with the surface of element 40 and also in preventing withdrawal of the stem from rim 48. A similar one-way exhalation valve assembly is provided at the bottom of nose piece 11 and comprises valve 55 mounted by valve stem 56 in rim 58 and ribs 60. The function of this valve is to permit air to pass out from the nose chamber through apertures 62 between ribs 60, but to prevent the entry of the outside air into the nose chamber.

The rearward portions of nose piece 11 are particularly designed for engagement with the face of the wearer and with main frame 10. Frame portion 40 of nose piece 11 extends into a top flange 64 adapted to overlie the nose of the wearer and two side flanges 65 adapted to engage the wearer's cheeks. Lip portion 66 extends between flanges 65 and is adapted to engage the upper lip of the wearer and thereby to complete the sealing of the nose chamber from the outside atmosphere. At their forward surfaces, flanges 64 and 65 are so formed as to engage flange portions 16 and 32, and the lower portion of rim 12 engages the complementary groove defined by the domed configuration of shield 42 and flange 64. It will thus be seen that when the device is assembled in position on the face of the wearer, the eye chamber is sealed from the nose and from the outside atmosphere except for air entering through ventilation ports 33, and the nose chamber is similarly sealed except for air entering by way of conduit chamber 44 and valve 45.

The invention accordingly provides conduit means between the eye chamber and conduit chamber 44, and said conduit means also function to secure main frame 10 and supplemental frame 11 together. As is shown particularly in Figs. 1, 3 and 6, shield 42 is formed with a pair of bulb-like portions 70 so positioned that their upper surfaces will engage the lower surface of portion 15 of main frame 10 when the two frames are fitted together. Coincident holes are provided in each of these members at their points of engagement, and tubes 72 of metal or plastic engage in these holes and are retained therein by annular shoulders 74 at each end thereof. In this manner tubes 72 serve both to secure frame 10 and nose piece 11 together and also provide communication between the eye chamber and conduit chamber 44. The only modification of the main frame structure required for this purpose is to provide sufficient slack in filter cloth 35 adjacent the apertures in frame portion 15 to accommodate shoulders 74 on tubes 72.

It is believed that operation of the goggle of the invention will now be readily understood. When the main frame is worn without nose piece 11, it functions as a conventional goggle, and cloth 35 over the apertures in frame portion 15 for tubes 72 serves to prevent infiltration of dust or other particles. When it is worn with nose piece 11, each inhalation by the wearer will draw air from the outside atmosphere through ports 33 into the eye chamber, whence it passes by way of tubes 72 into conduit chamber 44 and then by way of valve 45 into the nose chamber and wearer's nose. Upon exhalation the air passes into the outside atmosphere by way of valve 55 and is prevented by valve 45 from returning to conduit chamber 44 or the eye chamber. During this operation,

cloth 35 serves both to filter and to diffuse the air entering the eye chamber, and it will be seen, therefore, that each time the wearer breathes he acts to evacuate and replace the air in the goggle eye chamber and thus prevents the accumulation of sufficient moisture therein to precipitate and fog lens 14.

The above described embodiment of the invention is subject to considerable modification without departing from within the scope hereof. In particular the construction of main goggle frame 10 may be varied in many details provided it will still properly engage nose piece 11 and the wearer's face to provide the desired seal. The connecting means between frames 10 and 11 may similarly be varied widely, and it is to be expressly understood that tubes 72 are shown merely as an illustrative example of one operative form of connecting means. For example, in another modification there may be used in place of each of tubes 72 a snap fastener element similar to elements 20 and 22 but comprising an elongated, open-ended male member and an open eyelet in place of the illustrated closed female member. The structure of nose piece 11 may be similarly varied without departing from the scope of the invention. For example, the invention is not limited to any particular structure or location for valve 45. Valve 55 may be dispensed with entirely, and the wearer may exhale through his mouth. In still another modification, nose piece 11 may be extended to cover the mouth of the wearer provided the functions of the valves and the sealed connection to main frame 10 be maintained. In view of these and many other changes which may be made in the above construction without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the following claims are intended to cover all the generic and specific features of the invention herein described, and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

What is claimed is:

1. A goggle of the character described comprising, in combination, a main frame including a rim portion adapted to hold a lens and a face-engaging portion extending rearwardly from said rim and adapted to cooperate with such lens to define an eye chamber sealed from the nose of the wearer of said goggle, said frame having a plurality of ports therein communicating with the outside atmosphere, a supplemental frame separate from said main frame and defining a chamber enclosing the nose of said wearer, said supplemental frame including a portion adapted to engage the face of said wearer to seal said nose chamber from the outside atmosphere and from said eye chamber, said supplemental frame having a port therein providing communication from the outside atmosphere to said nose chamber, means for securing said supplemental frame to said main frame with said port in said supplemental frame in register with one of said ports in said main frame to receive gas from said eye chamber, said securing means being constructed to provide for attachment and detachment of said supplemental frame relative to said main frame, and valve means positioned to permit the passage of gas through said registering ports into said nose

5

chamber but preventing the passage of gas from said nose chamber to said eye chamber.

2. A goggle of the character described comprising, in combination, a main frame including a rim portion adapted to hold a lens and a face-engaging portion extending rearwardly from said rim and adapted to cooperate with such lens to define an eye chamber sealed from the nose of the wearer of said goggle, said frame having a plurality of ports therein communicating with the outside atmosphere, a supplemental frame separate from said main frame and defining a chamber enclosing the nose of said wearer, said supplemental frame including a portion adapted to engage the face of said wearer to seal said nose chamber from the outside atmosphere and from said eye chamber, said supplemental frame having a port therein providing communication from the outside atmosphere to said nose chamber, valve means in said supplemental frame positioned to permit the passage of gas through said port into said nose chamber but preventing the passage of gas from said nose chamber to said port, and means for securing said supplemental frame to said main frame with said port in said supplemental frame in register with one of said ports in said main frame to receive gas from said eye chamber, said securing means comprising a connector member adapted to engage simultaneously in both said registering ports and thereby to hold said frames together.

3. A goggle of the character described comprising, in combination, a main frame including a rim portion adapted to hold a lens and a face-engaging portion extending rearwardly from said rim and adapted to cooperate with such lens to define an eye chamber sealed from the nose of the wearer of said goggle, said frame having a multiplicity of ports therein communicating with the outside atmosphere, a supplemental frame separate from said main frame and defining a chamber enclosing the nose of said wearer, said supplemental frame including a portion adapted to engage the face of said wearer to seal said nose chamber from the outside atmosphere and from said eye chamber, said supplemental frame having a port therein at each side of the upper surface thereof providing communication from the outside atmosphere to said nose chamber, valve means in said supplemental frame positioned to permit the passage of gas through said ports into said nose chamber but preventing the passage of gas from said nose chamber to said ports, and means for securing said supplemental frame to said main frame with each said port in said supplemental frame in register with one of said ports in said main frame to receive gas from said eye chamber, said securing means comprising connector means adapted to engage in each said pair of registering ports and thereby to hold said frames together and to support said supplemental frame from said main frame.

4. A goggle of the character described comprising, in combination, a main frame including a rim portion adapted to hold a lens and a face-engaging portion extending rearwardly from said rim and adapted to cooperate with such lens to define an eye chamber sealed from the nose of the wearer of said goggle, said frame having a plurality of ports therein communicating with the outside atmosphere, a supplemental frame separate from said main frame and defining a chamber enclosing the nose of said wearer, said supplemental frame including a portion adapted to engage the face of said wearer to seal said

6

nose chamber from the outside atmosphere and from said eye chamber and also including inner and outer layers and means maintaining said layers in spaced relation to provide a conduit chamber overlying said nose chamber, a valve in said inner layer permitting the passage of gas from said conduit chamber into said nose chamber but preventing the passage of gas from said nose chamber into said conduit chamber, a further valve in said supplemental frame permitting the passage of gas from said nose chamber to the outside atmosphere but preventing the passage of gas from the outside atmosphere into said nose chamber, said supplemental frame having a port in said outer layer providing communication from the outside atmosphere to said conduit chamber, and means for securing said supplemental frame to said main frame with said port in said outer layer of said supplemental frame in register with one of said ports in said main frame to receive gas from said eye chamber, said securing means being constructed to provide for attachment and detachment of said supplemental frame relative to said main frame.

5. A goggle of the character described comprising, in combination, a main frame including a rim portion adapted to hold a lens and a face-engaging portion extending rearwardly from said rim and adapted to cooperate with such lens to define an eye chamber sealed from the nose of the wearer of said goggle, said frame having a plurality of ports therein communicating with the outside atmosphere, a supplemental frame separate from said main frame and defining a chamber enclosing the nose of said wearer, said supplemental frame including a portion adapted to engage the face of said wearer to seal said nose chamber from the outside atmosphere and from said eye chamber, said face-engaging portion of said supplemental frame including a flange overlying the bridge of the nose and the area of the face beside the nose of said wearer, said face-engaging portion of said main frame being adapted to overlie said flange and the adjacent portion of said supplemental frame when said goggle is in position on the face of said wearer, one of said ports in said main frame being in said portion overlying said supplemental frame, said supplemental frame having a port therein adapted to register with said last named port in said main frame and thereby to receive gas from said eye chamber, a connector member adapted to engage simultaneously in both said registering ports and thereby to hold said frames together, and a valve positioned to permit the passage of gas through said registering ports from said eye chamber into said nose chamber but preventing the passage of gas from said nose chamber to said eye chamber.

6. A goggle of the character described comprising, in combination, a main frame including a rim portion adapted to hold a lens and a face-engaging portion extending rearwardly from said rim and adapted to cooperate with such lens to define an eye chamber sealed from the nose of the wearer of said goggle, said frame having a plurality of ports therein communicating with the outside atmosphere, a supplemental frame separate from said main frame and defining a chamber enclosing the nose of said wearer, said supplemental frame including a portion adapted to engage the face of said wearer to seal said nose chamber from the outside atmosphere and from said eye chamber, said supplemental frame having a port therein providing communication from

the outside atmosphere to said nose chamber, valve means in said supplemental frame positioned to permit the passage of gas through said port into said nose chamber but preventing the passage of gas from said nose chamber to said port, and means for securing said supplemental frame to said main frame with said port in said supplemental frame in register with one of said ports in said main frame to receive gas from said eye chamber, said securing means comprising a connector member adapted to engage simultaneously in both said registering ports and having spaced shoulders thereon adapted to overlap the portions of said frames surrounding said registering ports and thereby to hold said frames together and to support said supplemental frame from said main frame.

7. A goggle of the character described comprising, in combination, a main frame including a rim portion adapted to hold a lens and a face-engaging portion extending rearwardly from said rim and adapted to cooperate with such lens to define an eye chamber sealed from the nose of the wearer of said goggle, said frame having a multiplicity of ports therein communicating with the outside atmosphere, a supplemental frame separate from said main frame and defining a chamber enclosing the nose of said wearer, said supplemental frame including a portion adapted to engage the face of said wearer to seal said nose chamber from the outside atmosphere and from said eye chamber and also including spaced inner and outer layers providing a conduit chamber overlying said nose chamber, a valve in said inner layer permitting the passage of gas from said conduit chamber into said nose chamber but preventing the passage of gas from said nose chamber into said conduit chamber, a further valve positioned to permit the passage of gas from said nose chamber to the outside atmosphere but preventing the passage of gas from the outside atmosphere into said nose chamber, said outer layer of said supplemental frame having a pair of ports therein providing communication from the outside atmosphere to said conduit chamber, and means for securing said supplemental frame to said main frame with each said port in said outer frame layer in register with a port in said main frame to transmit gas from said eye chamber to said conduit chamber, said securing means comprising a pair of connector members each adapted to engage in one of said pairs of registering ports and having spaced shoulders thereon adapted to overlap the portions of said frames surrounding said registering ports and thereby to hold said frames together.

8. A goggle of the character described comprising, in combination, a main frame including a rim portion adapted to hold a lens and a face-engaging portion extending rearwardly from said rim and adapted to cooperate with such lens to define an eye chamber sealed from the nose of the wearer of said goggle, said frame having a plurality of ports therein communicating with the outside atmosphere, a supplemental frame separate from said main frame and defining a chamber enclosing the nose of said wearer, said supplemental frame including a portion adapted to engage the face of said wearer to seal said nose chamber from the outside atmosphere and from said eye chamber, said supplemental frame having a port therein providing communication from the outside atmosphere to said nose chamber, said supplemental frame being adapted for interfitting engagement with the nose-receiving portion

of said main frame and with said port in said supplemental frame in register with one of said ports in said main frame to receive gas from said eye chamber, a tube adapted to engage in said registering ports and having means thereon adapted for interlocking engagement with the portions of said frames adjacent said registering ports to secure said frames together and to provide a conduit between said chambers, and a valve in said supplemental frame positioned to permit the passage of gas through said tube and registering ports into said nose chamber but preventing the passage of gas from said nose chamber to said ports and eye chamber.

9. A goggle of the character described comprising, in combination, a main frame including a rim portion adapted to hold a lens and a face-engaging portion extending rearwardly from said rim and adapted to cooperate with such lens to define an eye chamber sealed from the nose of the wearer of said goggle, said frame having a multiplicity of ports therein communicating with the outside atmosphere, a supplemental frame separate from said main frame and defining a chamber enclosing the nose of said wearer, said supplemental frame including a portion adapted to engage the face of said wearer to seal said nose chamber from the outside atmosphere and from said eye chamber, said supplemental frame having a port therein at each side of the upper surface thereof providing communication from the outside atmosphere to said nose chamber, valve means in said supplemental frame positioned to permit the passage of gas through said ports into said nose chamber but preventing the passage of gas from said nose chamber to said ports, and means for securing said supplemental frame to said main frame with each said port in said supplemental frame in register with one of said ports in said main frame to receive gas from said eye chamber, said securing means comprising a pair of tubes each adapted to engage in one of said pairs of registering ports and having means thereon adapted for interlocking engagement with the portions of said frames adjacent said registering ports to secure said frames together and to provide conduits between said chambers.

10. A goggle of the character described comprising, in combination, a main frame including a rim portion adapted to hold a lens and a resilient face-engaging portion extending rearwardly from said rim and adapted to cooperate with such lens to define an eye chamber sealed from the nose of the wearer of said goggle, said frame having a multiplicity of ports therein communicating with the outside atmosphere, a supplemental frame separate from said main frame and defining a chamber enclosing the nose of said wearer, said supplemental frame including a portion adapted to engage the face of said wearer to seal said nose chamber from the outside atmosphere and from said eye chamber and also including spaced inner and outer layers providing a conduit chamber overlying said nose chamber, a valve in said inner layer permitting the passage of gas from said conduit chamber into said nose chamber but preventing the passage of gas from said nose chamber into said conduit chamber, a further valve in said supplemental frame permitting the passage of gas from said nose chamber to the outside atmosphere but preventing the passage of gas from the outside atmosphere into said nose chamber, said supplemental frame having a pair of ports in said outer layer providing communication from the outside atmosphere to said conduit chamber,

9

2,435,653

and means for securing said supplemental frame to said main frame with each said port in said outer frame layer in register with one of said ports in said main frame to receive gas from said eye chamber, said securing means comprising a pair of tubes each adapted to engage in one of said pairs of registering ports and having means thereon adapted for interlocking engagement with the portions of said frames adjacent said registering ports to secure said frames together

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and to provide conduits between said chambers.
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The following references are of record in the file of this patent:

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Number	Name	Date
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