

A. B. LAMB, E. W. MILLER AND P. W. CARLETON.
RESPIRATOR.

APPLICATION FILED JUNE 24, 1919.

Patented Sept. 14, 1920.

2 SHEETS—SHEET 1.

1,352,818.

Fig. 2

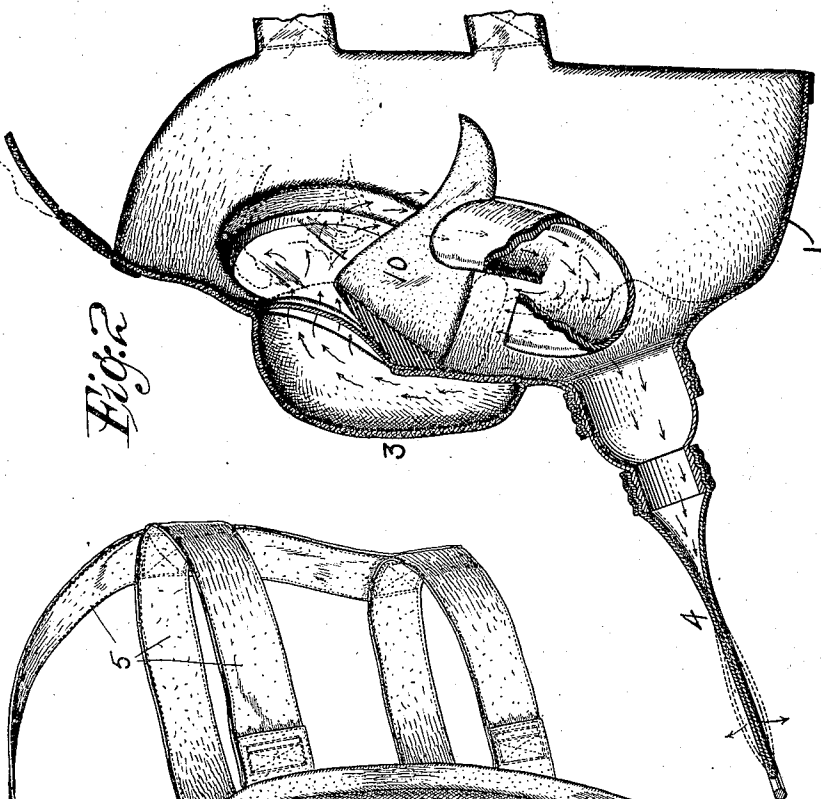
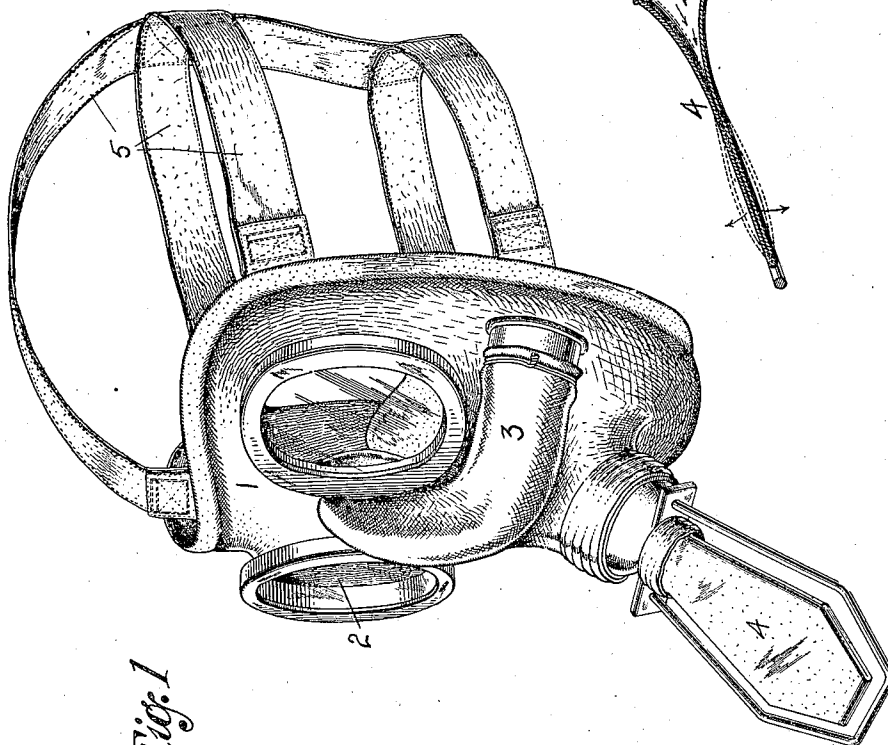


Fig. 1



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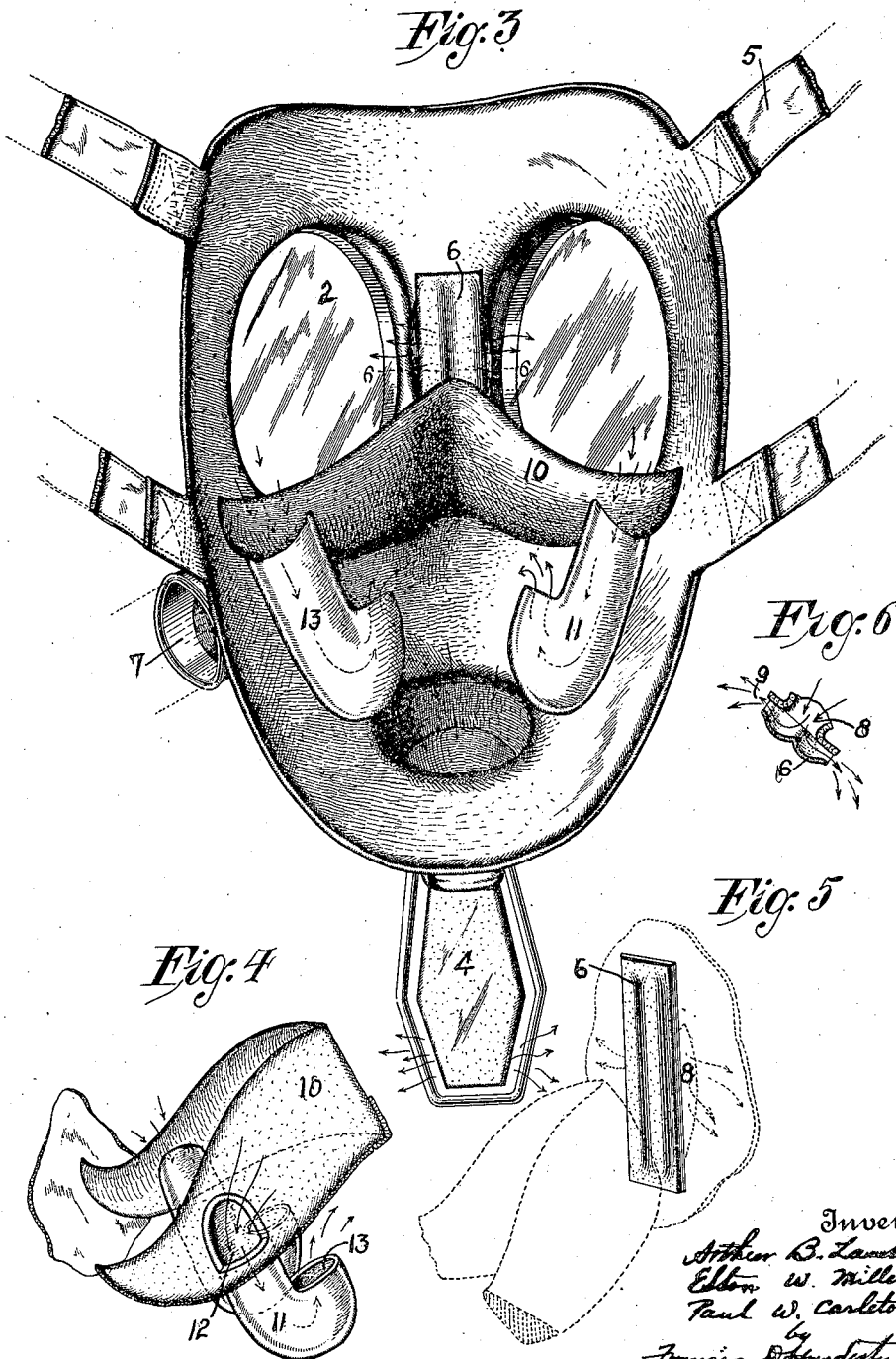
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UNITED STATES PATENT OFFICE.

ARTHUR B. LAMB, OF WASHINGTON, DISTRICT OF COLUMBIA, ELTON W. MILLER, OF AKRON, OHIO, AND PAUL W. CARLETON, OF PENNS GROVE, NEW JERSEY.

RESPIRATOR.

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Specification of Letters Patent. Patented Sept. 14, 1920.

Application filed June 24, 1919. Serial No. 306,359.

To all whom it may concern:

Be it known that we, ARTHUR B. LAMB, ELTON W. MILLER, and PAUL W. CARLETON, Chemical Warfare Service, United States Army, citizens of the United States, and residing at Washington, D. C., Akron, Ohio, and Penns Grove, New Jersey, respectively, have invented new and useful Improvements in Respirators, of which the following is a specification.

This invention relates to respirators of the type wherein air for breathing is first passed over the lenses to remove moisture which ordinarily accumulates by reason of exhaled air impinging on the same, and depositing some of its contained moisture. Respirators of this type, hitherto used have not been satisfactory by reason of the fact that with each breath exhaled air would strike the lenses condensing water, which would be cleared up by the succeeding inhaled air. This alternate dimming and clearing up obstructs the vision periodically and strains the eye making it difficult to wear the respirator for any length of time. Among the objects of this invention is the manufacture of a respirator which will not only not have the disadvantage of dimming the eye piece but which will not allow clouding of the same, even in cold weather.

To obviate these disadvantages we provide a respirator in which the exhaled air is not allowed to come in contact with the lenses. To accomplish this we provide a diaphragm within the mask to at least partially separate the eyes from the nostrils and mouth. Specifically, we place the diaphragm so as to substantially completely separate the eyes from the mouth and nostrils and connect the two spaces thus formed by a relatively long passage of relatively large volume. This passage effectively prevents the return of exhaled air from the mouth space, which normally takes place due to variations of the air pressure in breathing, and so prevents periodic clouding of the lenses.

In the accompanying drawings which illustrate a preferred embodiment of our invention Figure 1 is a perspective view of the mask. Fig. 2 shows a vertical section through the mask taken on a central line through the intake and exhaust openings some parts being shown broken away to more clearly indicate the structure. Fig. 3

is an interior view of the improved mask. Fig. 4 shows the new arrangement of diaphragm and accompanying tubes detached from the mask. Figs. 5 and 6 show details of the deflector which causes the incoming air to impinge on the lenses.

The face-piece 1 of the mask which may be of any well known construction but preferably as here shown of the molded type carries the usual lenses 2, intake pipe 3 and exhaust tube and flutter valve 4 and is held to the head of the wearer by elastic, flexible bands 5. The air intake passage 7 opens into the interior of the mask at point 8 directly between the lenses, and the deflector 6, constructed as more clearly shown in Fig. 6, is placed opposite the opening 8 to draw the air currents over the lenses. A diaphragm 10 which divides the interior of the mask into upper and lower spaces (here called for convenience eye-space and mouth-space, respectively,) is placed so that it will rest high upon the bridge of the nose of the wearer to prevent any undue interference with the breathing by reason of pressure of the diaphragm on the nostrils. One or more tubes 11, preferably bent as shown are inserted in the diaphragm 10, the upper ends 12 of the bent tubes communicating with the eye-space, the lower ends 13 opening into the mouth-space preferably in such a direction as to throw the incoming air into the nostrils.

The mask is adjusted to the face, the diaphragm 10 substantially completely separating the eyes from the nostrils and mouth. Air is drawn in by the action of breathing through intake 7 entering the mask at 8, is deflected by deflector 6 over the lenses 2 removing any moisture which may have accumulated there and passes down tubes 11 and into the mouth space at 13 to be breathed. On the exhalation the air passes out through flutter valve 4, substantially no moist exhaled air being allowed to pass back through tubes 11 into the eye-space since the air already in such tubes acts as a buffer preventing exhaled air from passing back. These tubes are sufficiently large and long containing at least an amount of air corresponding to the change in volume produced by the change in pressure within the mask caused by breathing.

Although we have shown and described the diaphragm and bent tubes as being separated

rate pieces, we desire that our invention be not limited to such exact structure but we contemplate making these parts either separate or integral with each other or even
5 molded into the mask as an essential portion of the same.

From the foregoing it is apparent that our invention, by providing a device wherein the eye space is so sealed from the
10 mouth space as to prevent the exhaled air from backing up into the eye space, and still allowing of the unobstructed passage of inhaled air, obviates the disadvantages of prior respirators in a very simple manner. It will thus be seen that by preventing
15 the moisture laden exhaled air from contacting with the lenses, clouding is prevented and the vision is kept clear at all times.

20 Having thus described our invention we claim as new:

1. In a respirator a diaphragm dividing

the same into eye and mouth spaces and one or more tubes extending through the said diaphragm connecting the spaces so formed. 25

2. In a respirator a diaphragm dividing the same into eye and mouth spaces and one or more bent tubes extending through the said diaphragm connecting the spaces so formed. 30

3. In a respirator a diaphragm dividing the same into eye and mouth spaces and one or more tubes of relatively large volume extending through the said diaphragm connecting the spaces so formed. 35

4. In a respirator a diaphragm dividing the same into eye and mouth spaces and one or more bent tubes curved upwardly and of relatively large volume extending through the said diaphragm connecting the spaces so formed. 40

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