

July 13, 1926.

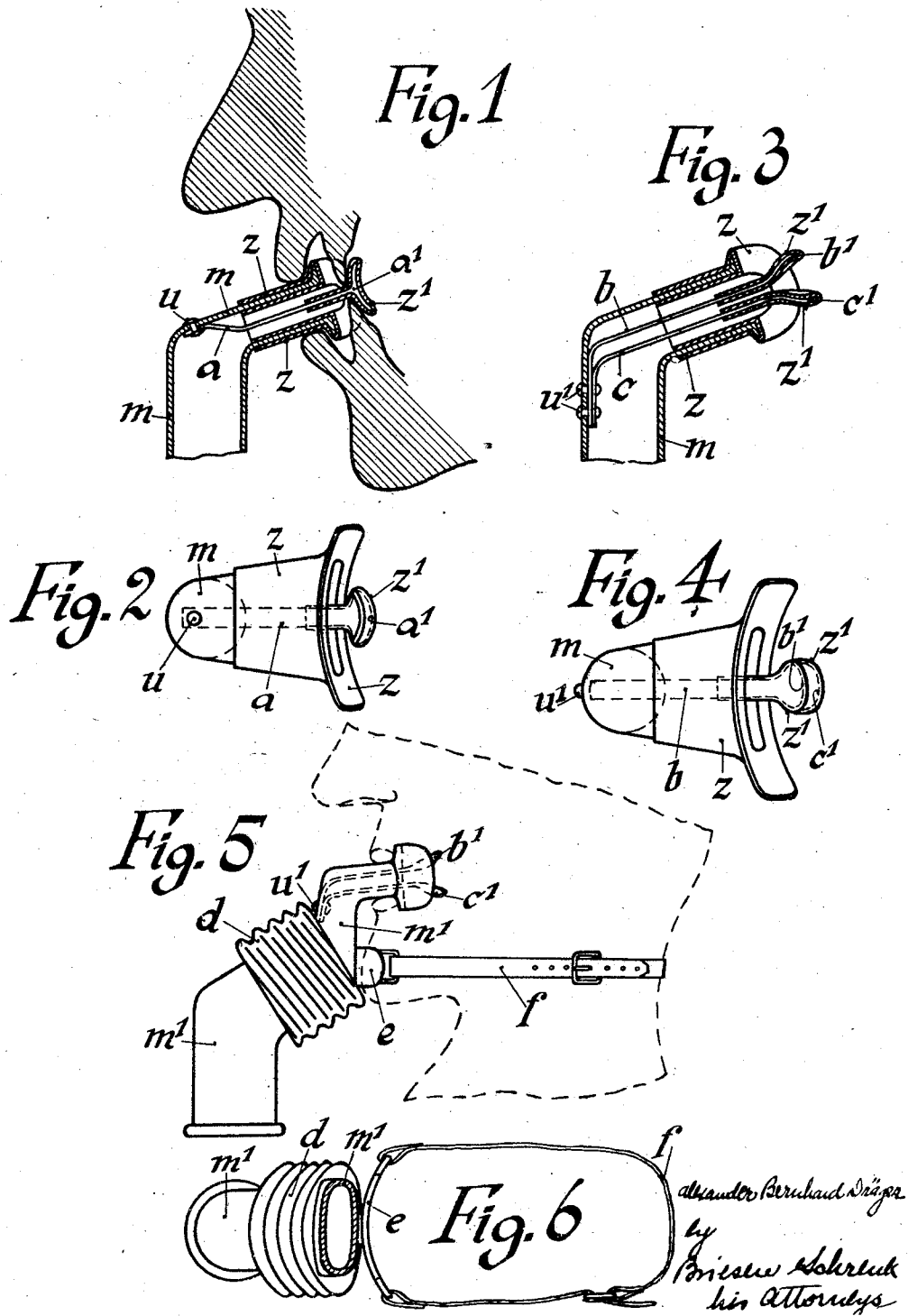
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MOUTHPIECE FOR RESPIRATORY APPARATUS

Filed June 9, 1921

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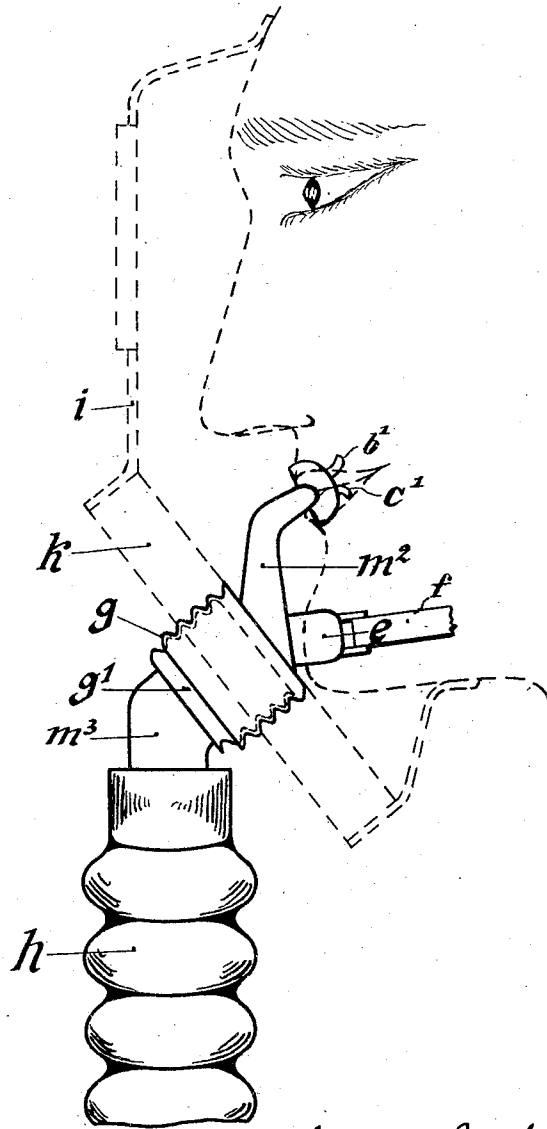
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Fig. 7



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MOUTHPIECE FOR RESPIRATORY APPARATUS.

Application filed June 9, 1921, Serial No. 476,231, and in Germany December 15, 1915.

(GRANTED UNDER THE PROVISIONS OF THE ACT OF MARCH 3, 1921, 41 STAT. L., 1313.)

Applications for this invention have been filed in Germany, Dec. 15, 1915, March 11, 1916, March 29, 1916, May 26, 1916 (two), and May 29, 1916; in Austria, Dec. 12, 1916, and March 5, 1917; in Hungary, Jan. 12, 1917 (three), and March 10, 1917 (three); in Great Britain, July 5, 1920 (two); and in France, July 10, 1920.

Respiratory apparatus, particularly self-contained breathing devices, are provided with a breathing pipe equipped at the free end with a tubular mouthpiece which is held in the mouth by the wearer of the apparatus, in order to ensure the admission of respirable air to the breathing organs.

The invention relates to such mouthpieces and concerns the special construction, formation and arrangement thereof, and has for its object to provide a novel construction whereby the carrying of the mouthpiece and the firm holding thereof in the mouth is made easier and more pleasant, and the use of such mouthpiece in connection with a gas mask is rendered possible.

The object aimed at is attained by providing the tubular mouthpiece inside with a member in the form of a strip or the like, preferably of springy material, which extends beyond the end of the mouth-piece a distance sufficient to permit it to be positioned at the rear of the teeth. It is by this member or strip that the mouth piece is grasped by the teeth, whilst air is excluded from the mouth by reason of the fact that the mouthpiece is kept air-tight by the lips which embrace it. To make the member or strip capable of being easily and comfortably held by the teeth its free extremity may be provided with an enlargement of any suitable form and size adapted to rest as a stop against the rear side of the teeth.

A further feature of the invention consists in providing the tubular mouthpiece with two spring members or strips instead of one single member or strip, said members or strips lying some distance apart, one above the other, and projecting beyond the rear opening of the mouthpiece so as to be capable of being easily grasped by the teeth.

A still further feature of the invention consists in providing the mouthpiece with a chin member, such as a block or pad, which by bearing and resting against the chin of

the wearer of the mouthpiece, holds and maintains the said mouthpiece in a steady, proper position and prevents it from developing jerky movements caused by running or jumping, or at least reduces such movements to such an extent that they do not feel unpleasant. The steady position of the mouthpiece and of the chin member may be still further ensured by means of a suitable neck strap appropriately fastened to the chin member of the mouthpiece and arranged to encircle the neck of the wearer.

An other feature of the invention consists in constructing the mouthpiece in a double bent or cranked form and providing it in its central or cranked part with an external screw thread, whereby the mouthpiece may be screwed into the customary internally threaded central opening of the mouthplate of a gas mask. The mouthpiece may also be constructed to consist of two separate bent pieces which when screwed together or otherwise firmly connected with each other, form likewise a cranked mouthpiece having an external thread at its central cranked part.

The last feature of the invention consists in providing a mouthpiece and a strip or strips preferably made of sheet metal or the like and covering the same wholly or partly with a coating of celluloid or the like which serves as a substitute for the usual rubber coating and makes the holding of the mouthpiece between the teeth and in the mouth in general more pleasant.

In the accompanying drawings are shown diagrammatically by way of example several forms of the improved mouthpiece.

Fig. 1 is a longitudinal sectional elevation and

Fig. 2 a plan of a mouthpiece according to the present invention.

Figs. 3 and 4 are similar views disclosing a modification of the mouthpiece;

Fig. 5 shows in side elevation a cranked mouthpiece with a chin member;

Fig. 6 is a top view of the mouthpiece shown in Figure 5, as it appears after its upper part has been broken away; and Fig. 7 is an elevation of another modification of the mouthpiece.

Similar letters of reference refer to similar parts throughout the several views.

As it is obvious from Figures 1 and 2, a

member or strip a is fastened, preferably so as to be pivotally movable, at u within the tubular mouthpiece m made for example of sheet metal. The more or less rigid strip a is so dimensioned in length that its free end projects beyond the opening of the mouthpiece a distance sufficient to bring its free end, which is preferably provided with a button-like enlargement a^1 , to the rear of the teeth of the user of the device.

In practice, the mouthpiece is inserted into the mouth in the manner indicated in Fig. 1, and the strip a is grasped by the teeth so that the enlargement a^1 is in the rear thereof, whilst the lips embrace the mouthpiece proper and form an air-tight connection therewith whereby the surrounding air is prevented from entering the mouth. This arrangement, to a certain degree, permits a free movement of the mouthpiece in the mouth, that is to say, between the lips, without breaking the connection with the teeth which may remain or be kept rather in their natural position without effort.

The mouthpiece as well as the strip especially those parts thereof which are to be introduced into the mouth, are covered with a coating of celluloid z and z^1 respectively. The coatings are of such thickness that sharp edges, borders and the like, if any, are practically rounded off and thereby prevented from hurting the wearer. As the mouthpiece, or more properly the strip, is mainly grasped and held by the teeth, it is much more convenient and pleasant, to bite elastic celluloid than hard sheet metal.

According to Figures 3 and 4, two spring strips b and c of any suitable springy material are fixed at w^1 in the interior of the tubular mouthpiece m , which strips normally lie some distance apart, one above the other, and are of such a length that their free ends project from the opening of the mouthpiece in a manner to be conveniently grasped by the teeth. To enable the spring strips to be better held by the teeth their free ends are provided with outwardly, that is to say, upwardly and downwardly bent thickened portions b^1 and c^1 .

In the modification shown in Figures 5 and 6 the mouthpiece m^1 is of a cranked shape or form and is provided at its central part with an external screw thread d by means of which the mouthpiece may be screwed into the customary internally threaded central opening of the mouthplate of a gas mask, after the usual air-filter has been unscrewed and removed therefrom. The breathing pipe may be attached directly to the lower end of the mouthpiece m^1 . The mouthpiece is provided at the proper point, with a suitably formed chin member e made of appropriate material, such as a metal block or strip, and lined with a pad or the like if desired. This chin member which is

permanently connected with the mouthpiece so as to comprise a fixed part thereof bears against the chin of the person wearing the apparatus and steadies the mouthpiece and maintains it against vibration in the position it occupies when in use.

A neck strap f or the like may be utilized to secure the mouthpiece against the chin of the wearer of the apparatus. The said neck strap suitably fastened to the chin member e is strapped round the wearer's neck in a manner which will be clear from Figures 5 and 6 without further explanation.

Referring to the modification shown in Figure 7 the cranked mouthpiece is composed of two separate parts m^2 and m^3 which are screwed together by means of threaded sockets g and g^1 . The socket g is externally threaded and the part m^2 is provided likewise with a chin member e . The flexible breathing pipe or hose h is connected to the part m^3 .

When the breathing device is to be used in combination with a gas mask the parts m^2 and m^3 are disconnected. The part m^2 is then screwed by means of its external thread g , from within the gas mask, into the internal thread of the central opening of the mouthplate k of the gas mask, shown by dotted lines in Figure 7. After this the part m^3 by means of its threaded socket g^1 is screwed from the outside into connection with the internal thread of the socket g already screwed into the mouthplate. The cranked mouthpiece m^2, m^3 is thus connected with the mouthplate of the gas mask in a reliable and gas-tight manner and in the proper position with relation to the mouth of the wearer.

I claim:

1. In a respiratory apparatus, the combination of a tubular mouthpiece adapted to be held between the lips and to lie in front of the teeth, a device secured interiorly of said mouthpiece and projecting outwardly beyond the lip accommodating end of the mouthpiece and being arranged to be grasped by and between the teeth, and means at the free end of said device adapted to lie upon the inside of the teeth.

2. The combination of a tubular mouthpiece for respiratory apparatus adapted to be held only between the lips, and a holding strip connected with the interior of said mouthpiece and projecting outwardly beyond the same, said strip being movable relative to said mouthpiece and constituting a projection to be grasped only by the teeth.

3. The combination of a mouthpiece for respiratory apparatus adapted to be taken only between the lips, and two strips of resilient material connected with said mouthpiece and normally lying some distance apart and one above the other, so as to be capable

of yielding towards each other, said strips projecting beyond the opening of the mouthpiece between and beyond the teeth and adapted to be grasped only thereby.

4. The combination of a mouthpiece for respiratory apparatus adapted to be taken only between the lips, two strips of resilient material connected with said mouthpiece and normally lying some distance apart and one above the other, said strips projecting beyond the opening of the mouthpiece, and adapted to be grasped only by the teeth, and oppositely bent and thickened portions at the free ends of said strips for providing grips or stops for the teeth.

5. In a respiratory apparatus, the combination of a crank-shaped mouthpiece comprising a tubular portion arranged to be held between the lips and extending substantially perpendicular to the plane of the face, a portion depending from said first-mentioned portion in a plane substantially parallel to the face and closely adjacent to the chin, and a portion extending outwardly from said depending portion and provided with means for attaching the mouthpiece to a mask.

6. In a respiratory apparatus, the combination of a crank-shaped mouthpiece comprising a member arranged to be held between the lips and extending substantially perpendicular to the plane of the face, a member depending from said first-mentioned member in a plane substantially parallel to the face and closely adjacent to the chin, and a member extending outwardly from said depending member and inclined with respect thereto, said member being provided with means for attaching the mouthpiece to a mask, and means for holding the depending member in engagement with the chin to maintain said mouthpiece against oscillation in the mouth.

7. In a respiratory apparatus, the combination of a crank-shaped mouthpiece comprising a member arranged to be held between the lips and extending substantially perpendicular to the plane of the face, a

member depending from said first-mentioned member in a plane substantially parallel to the face and closely adjacent to the chin, and a member extending outwardly from said depending member and inclined with respect thereto, said member being provided with means for attaching the mouthpiece to a mask, a chin member permanently carried by the depending member adapted to engage the chin to maintain said mouthpiece against oscillation, and a neck strap attached to said chin member for fixing it in place against the chin.

8. A mouthpiece for respiratory apparatus comprising a section adapted to be held between the lips and extending substantially at right angles to the plane of the face, a section depending from the first-mentioned section in a plane substantially parallel to the plane of the face, said depending member being arranged adjacent to the chin, a section inclined downwardly and outwardly from said depending member and provided with means for attaching the mouthpiece to a mask, and a section extending downwardly from the outer end of the inclined section, the last-mentioned section being substantially parallel to the depending section.

9. A mouthpiece for respiratory apparatus comprising a section adapted to be held between the lips and extending substantially at right angles to the plane of the face, a section depending from the first-mentioned section in a plane substantially parallel to the plane of the face, said depending member being arranged adjacent to the chin, a section inclined downwardly and outwardly from said depending member and provided with means for attaching the mouthpiece to a mask, and a section extending downwardly from the outer end of the inclined section, the last-mentioned section being substantially parallel to the depending section, and a chin strip secured to the depending member adapted to retain the depending member against the chin to prevent oscillation of the mouthpiece.

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