

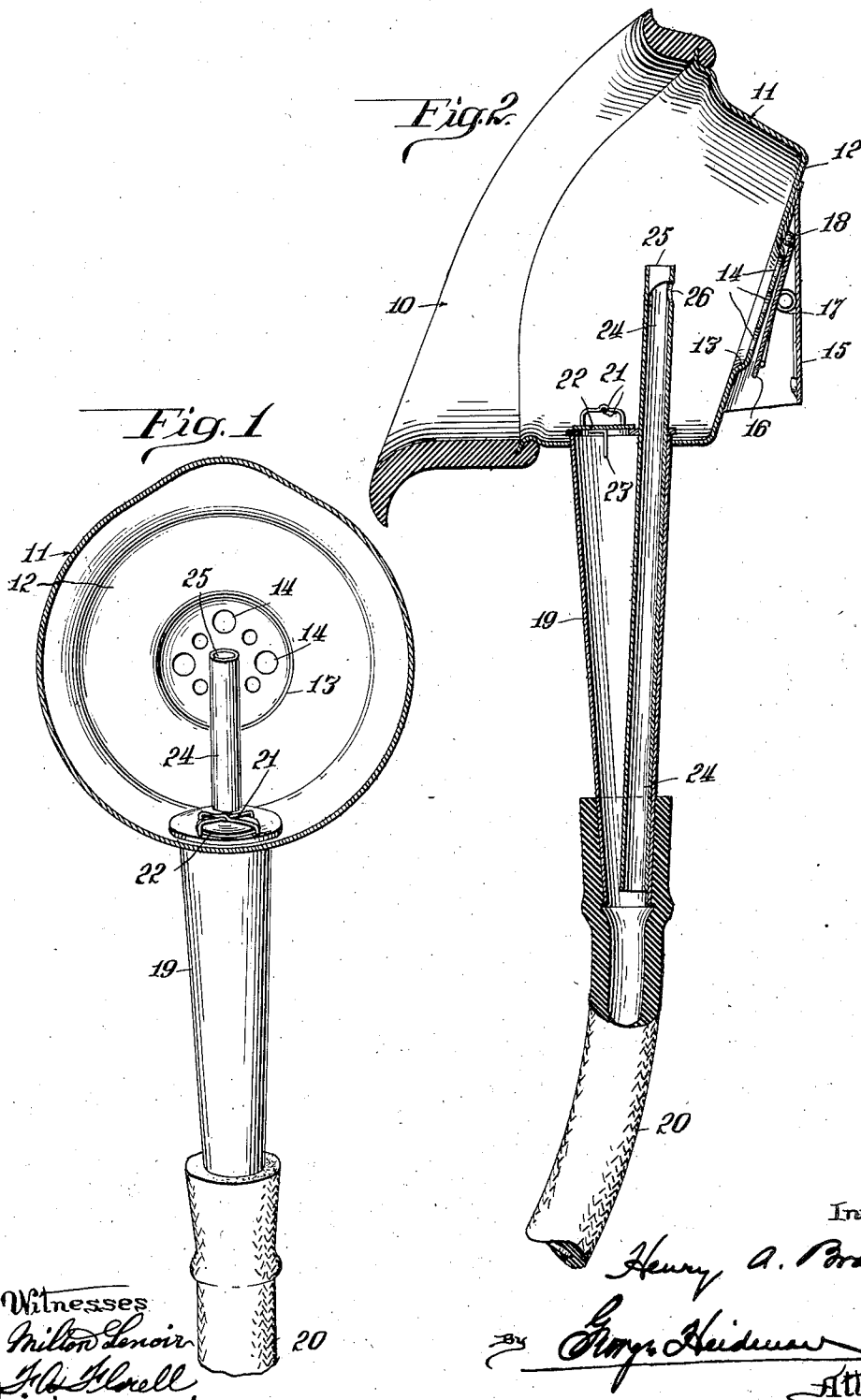
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H. A. BRAND

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AIR MASK

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Witnesses
Milton Lenoir
J. H. Howell.

Inventor
Henry A. Brand,
by Ernest Heideman
Attorney

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AIR MASK

Henry A. Brand, Michigan City, Ind.

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2 Claims. (Cl. 128—146)

My invention relates to air masks worn by artisans engaged in occupations where dust and dangerous fumes or gases are encountered; the mask being intended to encase the nose and mouth of the wearer or user and adapted to be connected with a suitable source of air under pressure.

The invention has for its object the provision of a mask of the character mentioned whereby a substantially positive pressure within the mask may be maintained; provided with means whereby proper dissipation of the pressure of the incoming air will occur and a diffusion of the air within the mask produced.

Another object of the invention is the provision of a construction whereby ingress of dust particles or fumes through the exhaust outlet will be prevented and at the same time improper inhalation through the exhaust outlet also made impossible.

These objects and other objects and advantages of my invention, as well as the structural features by means of which these objects and advantages are obtained, will be readily comprehended from the following detailed description of the accompanying drawing, wherein—

Figure 1 is an inside or rear view of the device in elevation with a portion of the air line broken away.

Figure 2 is a vertical sectional view.

The face-engaging portion comprises a suitable rubber cushion 10 of proper configuration so as to fit over the nose and about the mouth of the user and effect a substantially air sealing relation with the face of the user. This cushion may be of the well known types at present in use, namely either of the inflated or non-inflated type as desired. These cushions are made to be removably attached to the metallic shell 11 of the mask; the cushion or the shell-engaging portion thereof being usually of such dimensions relative to the face side of the shell 11 as to necessitate the cushion being stretched over the shell and have snug fitting relation therewith as shown in Figure 2. The shell 11 is somewhat cup-shape and has a forward end wall 12 shown provided centrally with an outwardly pressed or dished portion 13 shown provided with a plurality of openings 14.

The forward wall 12 is provided with a forwardly projecting inverted V-shape hood portion 15; the top and two sides whereof are intimately secured to the end wall 12 and surround the perforations 14 in the dished or raised portion 13 of the end wall; the lower flared end of the hood

15 being preferably disposed in a plane beneath that of the openings 14, and being open to the atmosphere. Pendently secured in the upper end of the hood 15 is a flap valve 16 which is adapted to completely cover the openings 14; the valve 16 being held against too far opening by a suitable spring as at 17. The valve 16 is loosely hung at its upper end so as to be free to swing about its horizontally disposed pivot 18.

The bottom or lower wall of the shell 11 is provided with a tube 19 intimately secured at its upper end to the shell. The tube 19 extends downwardly from the shell and tapers toward its lower end to which an air line 20 is secured; the line 20 leads from a suitable source of compressed air. The tube 19, as more clearly shown in Figure 2, gradually flares toward the upper end where it is provided with guard wires 21 which are bowed upwardly and spaced from the upper end of the tube 19. These guard wires 21 provide a cage whereby a disc valve 22 is held against displacement while permitting the disc to move upwardly through the action of the incoming air. In order to ensure proper seating of the disc, it is shown provided on the bottom with a depending pin 23.

Arranged within the air tube 19, adjacent one side thereof, is a smaller tube 24.

This tube 24 extends from the lower end of tube 19 and passes upwardly beyond the upper end of tube 19 to a point substantially opposite the center of the perforated portion 13 in the front wall of the shell 11. The upper end of tube 24 is preferably arranged at a distance from the wall 12; with the upper end closed as shown at 25, with the lower surface of the end closure 25 preferably dished or curving toward the forward side of tube 24 which is provided with an outlet opening 26; the arcuate lower surface of end closure 25 directing the air toward the outlet opening 26 and causing the jet of air to be directed toward the exhaust holes 14.

The air tube 24 is preferably of the same diameter throughout and its inlet end is preferably about an eighth of an inch removed from the outer end of the main air tube 19. With tube 24 communicating with and extending directly from the air line or inhalation tube of the mask a substantially constant air line pressure in the mask is maintained; the air discharged from the outlet 26 is directed toward the exhalation outlet and expands adjacent thereto and aids in discharging the vitiated air from the mask.

The air coming into the mask through inlet tube 19 is not only allowed to somewhat expand

within the gradually flaring tube 19 and hence somewhat reducing its undesirable force, but the ingoing air is also diffused or spread out by the disc valve 22 thereby eliminating the very undesirable condition generally encountered where a strong air jet or stream is discharged toward the nose and mouth of the user.

Providing the disc valve 22 with the pin 23 depending from the bottom, the valve is not only given proper weight to effectively perform its function but the pin also aids in a proper seating of the valve. The nature and positive seating of valve 22 also prevents dust particles from entering the intake tube in the event of air line failure and improper application of the mask to the face whereby dust particles would be permitted entering around the cushion and hence no dust particles can drop into the air inlet tube and to ultimately be blown back into the mask and therefore into the wearer's nostrils.

With valve 16 hingedly secured at its top in the housing or hood, it acts as a swinging check valve against inhalations through openings 14. The normal opening limit of this valve is controlled by the spring 17 which prevents the valve from falling or swinging too far open, as might occur in certain positions of the wearer's head. If the swing valve 16 was allowed to drop forward against the front wall of the housing or hood 15 while the user is in a stooping position, it would prevent proper closing of the valve by the inhalation of the wearer and as a result there would be an intake of dust laden air through the exhaust openings. The spring 17 yieldingly maintains the free swinging valve 16 in sufficiently close proximity to the exhaust openings where inhalation will cause the valve to move to and remain in closed position. On the other hand, the spring 17 is such and so arranged that in the event of too great a flow of incoming air from the air line, the spring will permit the exhaust valve to move to an abnormal open position and compensate for the excess air volume.

The exhaust outlet involves a sufficient number of holes 14. Except for the face cushion 10 my improved mask is made entirely of metal; while

the cushion is preferably removably secured on the perimeter of the shell 11.

The exemplification is believed to be the best embodiment of the invention which, however, may have expression in certain modifications without departing from the spirit of the invention as defined in the appended claims.

What I claim is:

1. An air mask of the character described comprising a shell open at one end to fit about the nose and mouth while the opposite end wall is provided with an exhaust opening; an air inlet in a side wall provided with an air expanding tube tapering away from the inlet and adapted to be connected with an air supply line; a self-seating disc seatable on said air inlet orifice whereby the incoming air is diffused laterally in a substantially annular manner toward the sides of the mask; a loosely swinging valve adjacent to the exhaust opening adapted to close the latter during inhalation by the wearer; and a tube connected with the air supply and extending into the mask with a discharge opening disposed so as to direct an air jet toward the exhaust opening.

2. An air mask of the character described comprising a shell open at one side to fit about the nose and mouth of the user while the opposite wall is provided with an exhaust opening; a downwardly opening hood over said opening; air conveying means secured to and terminating in the bottom wall of the shell in an annular opening, a portion of said means permitting the air to expand before delivery into the shell for inhalation, while a second portion of said means extends upwardly into the shell with a forwardly disposed discharge opening so as to direct a jet of air toward said exhaust opening; a gravity seating disc at the air inlet orifice of said first portion whereby the incoming air is diffused circumferentially laterally; a swinging valve pivotally secured at its upper end in said hood so as to depend across the exhaust opening; and yielding means for limiting the movement of the valve away from the exhaust opening.

HENRY A. BRAND.