

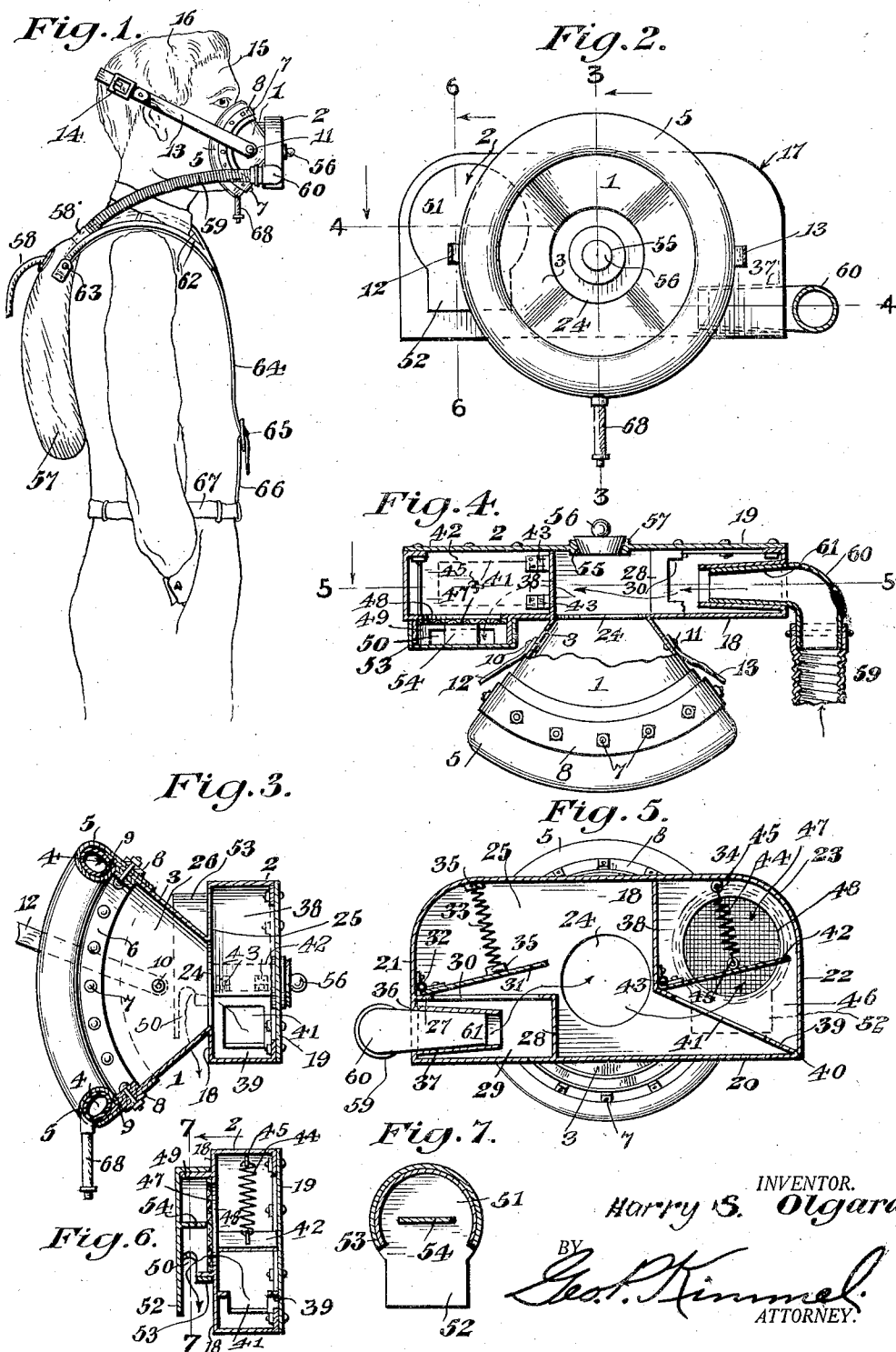
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RESPIRATOR

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UNITED STATES PATENT OFFICE.

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RESPIRATOR.

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This invention relates to a respirator for protecting operatives employed where the atmosphere is liable to be charged with deleterious particles of matter or injurious gases, and has for its object to provide, in a manner as hereinafter set forth, a respirator which may be readily attached against the face of the wearer to enclose the mouth and nostrils and further including means for supplying fresh pure air for inhalation and from which the exhaled air can be separately discharged.

A further object of the invention is to provide, in a manner as hereinafter set forth, an air container and new and novel means for connecting the same in position with respect to the other elements of the respirator, and further with new and novel means for connecting the container to the body of the wearer.

Further objects of the invention are to provide, in a manner as hereinafter set forth, a respirator which is comparatively simple in its construction and arrangement, strong, durable, compact, thoroughly efficient in its use, conveniently positioned, and comparatively inexpensive to manufacture.

With the foregoing and other objects in view, the invention consists of the novel construction, combination and arrangement of parts, as hereinafter more specifically described and illustrated in the accompanying drawings, wherein is shown an embodiment of the invention, but it is to be understood that changes, variations and modifications can be resorted to which come within the scope of the claims hereunto appended.

In the drawings wherein like reference characters denote corresponding parts throughout the several views:—

Figure 1 is a side elevation of a respirator in accordance with this invention, showing the adaptation thereof with respect to a person wearing the same.

Figure 2 is a rear elevation thereof, in section.

Figure 3 is a section on line 3—3, Figure 2.

Figure 4 is a section on line 4—4, Figure 2.

Figure 5 is a section on line 5—5, Figure 4.

Figure 6 is a section on line 6—6, Figure 2.

Figure 7 is a section on line 7—7, Figure 6.

Referring to the drawings in detail, the respirator includes a body portion formed of a rear part generally referred to by the reference character 1 and a forward part generally referred to by the reference character 2. The rear part provides a shield and is adapted to enclose the nose and mouth of the wearer, and the forward part provides a combined valved inlet and valved outlet mechanism for controlling the inhaling and exhaling of air and to which leads a pure air supply. The rear part 1, at its forward end, is formed integral with the back of the forward part 2.

The rear part 1 comprises a hollow conoidal-shaped member 3 formed of light metallic material having secured to its rear or larger end a pneumatic cushioning element 4 providing a seal, or rather a snug fit throughout when the body portion is secured against the face of the wearer. The element 4 is in the form of a tube and is positioned against the inner face of the member 3 and projects rearwardly therefrom. The element 4 is secured in position by a flexible retaining member 5, which is positioned against the inner and outer faces of the member 3 and encloses the element 4. Positioned against that part of the member 5 which is arranged against the inner face of the member 3, is a binding strip 6, which is secured in position by hold-fast devices 7, not only extending through the strip 6, but also through that portion of the member 5 arranged against the inner face of the member 3, through the member 3, that portion of the member 5 arranged against the outer face of the member 3, and a binder strip 8 positioned against that portion of the member 5, which is arranged against the outer face of the member 3. The inner face at the rear end of the member 3 is bevelled, as at 9, and against which is positioned the element 4. When the rear part 1 of the body portion is positioned against the face of the wearer, the element 4 in connection with the member 5 acts as a seal to prevent the passage of injurious gases or other matter to within the member 3.

Secured to the outer face of the member 3, at diametrically opposite points, that is at the sides of said member 3, as indicated

- at 10, 11, are rearwardly extending securing straps 12, 13, respectfully, adapted to be adjustably connected together, as at 14, for the purpose of securing the member 3 in position against the face 15 of the wearer. The straps 12 and 13 extend around the back of the head 16 of the wearer when the body portion is in operative position. See Figure 1.
- 10 The forward part 2 of the body portion includes a casing referred to generally by the reference character 17 and which comprises a rear wall 18, a front wall 19, a bottom 20, and a pair of end walls, 21, 22.
- 15 The upper corners of the casing 17 are rounded, as at 23. The rear wall 18 is formed centrally with a combined inlet and outlet opening 24, which establishes communication between the chamber 25 formed by the casing 17 and the chamber 26 provided with the member 3. The forward end of the member 3 is integral with the wall 18 and registers with the wall of the opening 24. Connected to or formed integral with the inner face of the end wall 21, at a point between its transverse center and lower end, is a longitudinally extending partition 27 which terminates adjacent the opening 24 and merges into a vertically disposed partition 28 connected with or integral with the bottom 20. The partitions 27 and 28, in connection with the end wall 21 and bottom 20, provide a pure air inlet chamber 29. The partition 27 is formed with an outlet 30 for the chamber 29 and which is employed for establishing communication between said chamber 29 and chamber 25. The outlet 30 is normally closed through the medium of a spring controlled inlet valve 31 for the chamber 25. The valve 31 is pivoted, as at 32, to the wall 21 and seats on the top of the partition 27 to close the opening 30. An expansion spring 33 is interposed between the top wall 34 of the casing 17 and the valve 31. Sockets 35 are provided for the ends of the spring 33. The end wall 21, below the partition 27, is provided with an opening 36 and with an inwardly extending hollow cone-shaped holder 37, which registers with and forms a continuation of the wall of the opening 36. The holder 37 extends into the chamber 29 but is of less length than the length of said chamber.
- 50 Arranged within the chamber 25 is a vertically disposed partition 38 positioned in proximity to the opening 24 on that side opposite the side to which the partition 27 extends towards. The partition 38 is connected to or is integral with the top wall 34 and is of a height less than the height of the chamber 25. The lower end of the partition 38 terminates in an inclined partition 39, which extends towards the point of joinder of the end wall 22 with the bottom 20 and is connected with said walls, as at 40. The partition 39 is provided with an opening 41 constituting an outlet for the chamber 25, and said outlet is normally closed by a spring controlled valve 42, which is pivoted, as at 43, to the partition 38. The valve 42 seats on the upper face of the partition 39 to close the opening 41 and is normally maintained in open position by a pulling spring 44, which is interposed between the top wall 34 of the casing 17 and the upper face of the valve 42. The ends of the spring 44 are connected, as at 45. The partitions 38 and 39, in connection with the end wall 22, top wall 34, front and rear walls 18, 19, provide an outlet chamber 46, and the opening 41 establishes communication between the chambers 25 and 46.
- The rear wall 18 of the casing 17, between its vertical median and the end wall 22, is formed with an opening 47, and extending across the latter is a foraminous element 48, secured to the rear face of the wall 18 and arranged within a rearwardly extending collar 49, which is integral with the wall 18. The lower portion of the collar 49 is cut away, as at 50, to provide an outlet. A combined protecting and deflecting member is positioned rearwardly with respect to the foraminous element 48 and which comprises a circular upper portion 51 terminating in a rectangular depending extension 52. The portion 51, for a part of its length, is provided with a forwardly extending annular flange 53, which seats on the collar 49. A brace piece 54 is integral with and extends diametrically of the forward face of the portion 51 and bears against the foraminous element 48. The extension 52 depends to a point near the bottom 20 of the casing 17. The space between the ends of the flange 53 forms a continuation of the outlet 50.
- The front wall 19 is provided centrally with an opening 55, closed by a removable plug 56 and which provides means whereby access can be had to the chamber 25.
- A pure air container is indicated at 57 and which consists of a flexible bag provided with a valved inlet tube 58 for the purpose of supplying air to the container 57. The upper end of the container 57 has a nipple 58 to which is connected a flexible air supply pipe 59, having its forward end formed with an elbow-shaped nozzle 60, formed with a conoidal-shaped discharge end 61, which snugly fits the holder 37 when the nozzle is secured to the forward part 2 of the body portion of the respirator. See Figure 5. The container 57, when worn, is positioned at the back of the wearer, see Figure 1, and is retained in such position by a V-shaped supporting strap 62, having each of its legs fixedly secured to the side of the container 57, as at 63. The forward end of the strap 62 is connected to a depending strap 64, po-

sitioned at the front of the wearer and adjustably connected, as at 65, to a vertically extending strap 66, carried by a waist band 67. The element 4 is provided with a valved inlet tube 68.

When the respirator is mounted in position, the wearer, during the act of inhaling, will open the valve 31, thereby permitting of the supply of pure air from the container 57 into the chamber 25, and which passes through the opening 24 to the wearer. During the act of inhaling, the valve 42 will be moved to close the opening 41. On exhaling, the valve 31 will be moved to its seat, closing opening 24, and the valve 42 moved from its seat, thereby establishing communication between the chambers 25 and 46 for discharge.

It is thought that the many advantages of a respirator in accordance with this invention, can be readily understood, and although the preferred embodiment of the invention is as illustrated and described, yet it is to be understood that changes in the details of construction can be had which will fall within the scope of the invention as claimed.

What I claim is:—

1. A respirator comprising a combined nose and mouth protecting element, a casing connected to the forward end thereof and communicating therewith and provided with a valve controlled air inlet means and a valve

controlled air discharge means, said casing having a discharge opening at the rear thereof adjacent the forward end of said element, a screen extending across said opening, and a combined protecting and deflecting element connected to the rear of said casing and opposing said screen and providing means for deflecting the discharge of air downwardly into the atmosphere, said protecting and deflecting element further including means for bracing the screen.

2. A respirator comprising an air container having connected therewith an elbow-shaped discharge nozzle, a valve controlled air supply and discharging means adapted to be secured against the face of the wearer and enclose the mouth and nose of the wearer, said means provided with an air inlet chamber, an air receiving chamber and an air outlet chamber, said air inlet chamber having supported therein lengthwise thereof a conical shaped tubular member extending from the outer end wall and terminating at a point removed from the inner end wall of said chamber, said member spaced from the top, bottom and side walls of said inlet chamber and providing means for frictionally securing and supporting the discharge nozzle within said chamber.

In testimony whereof, I affix my signature hereto.

HARRY S. OLGARD.