

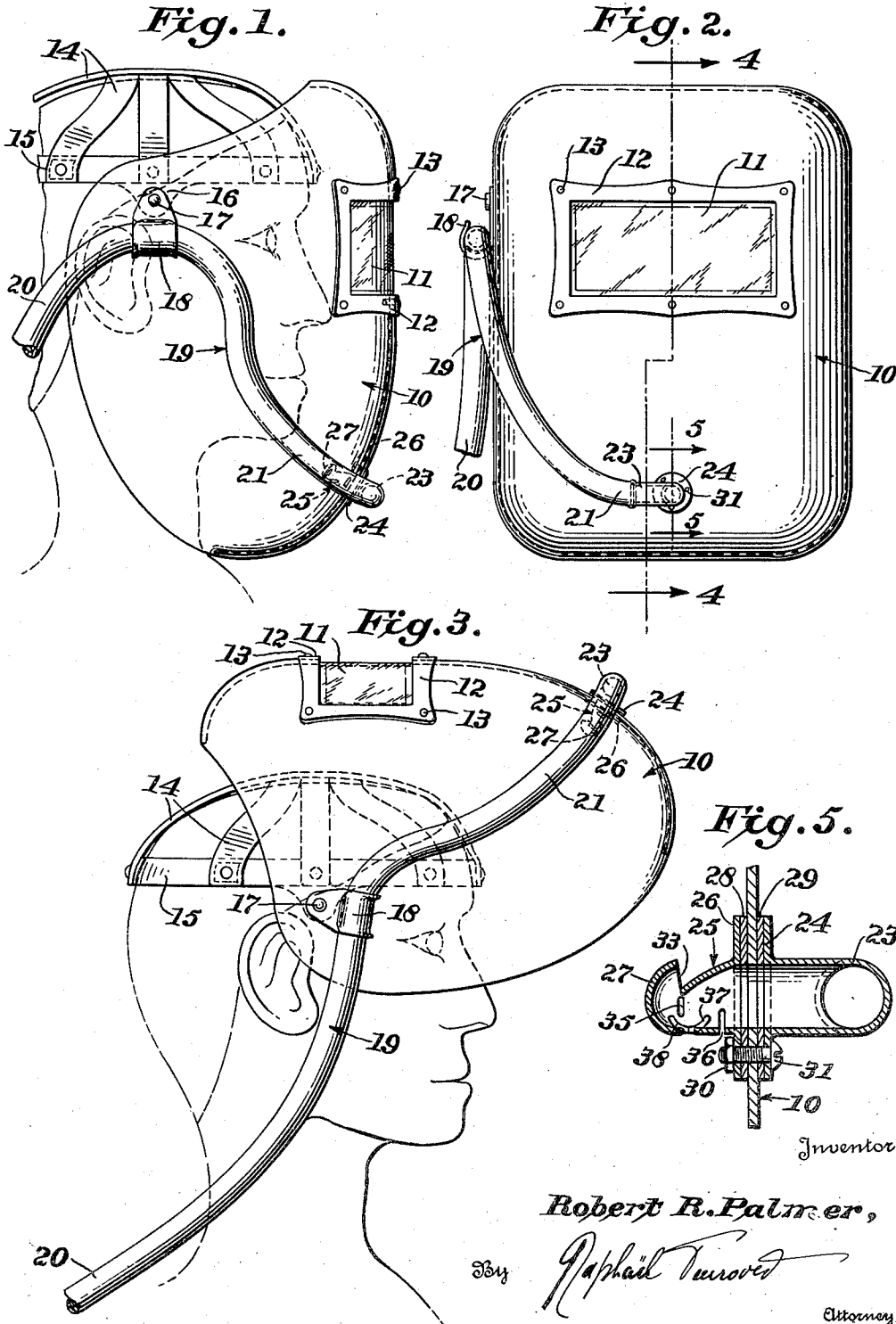
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R. R. PALMER
FACE MASK OR SHIELD

2,525,236

Filed April 23, 1946

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 4.

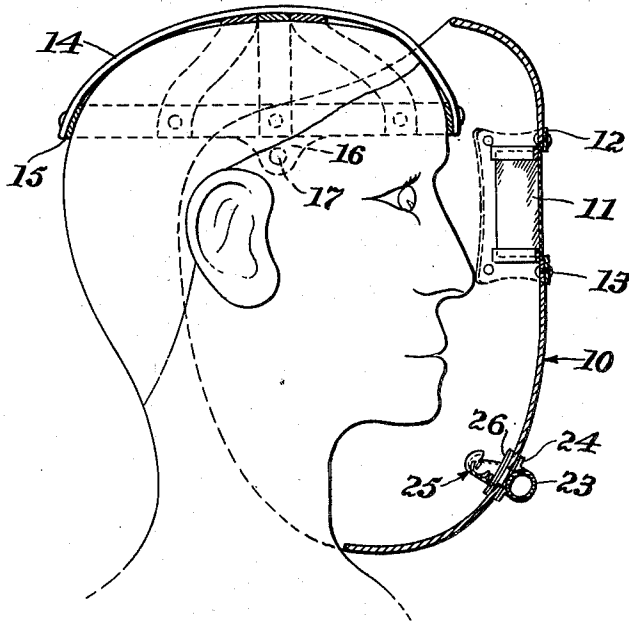


Fig. 7.

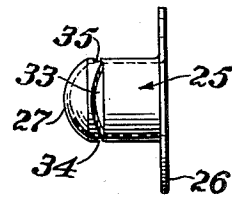


Fig. 8.

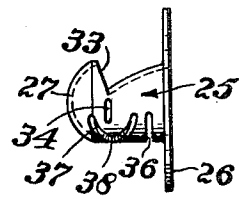


Fig. 6.

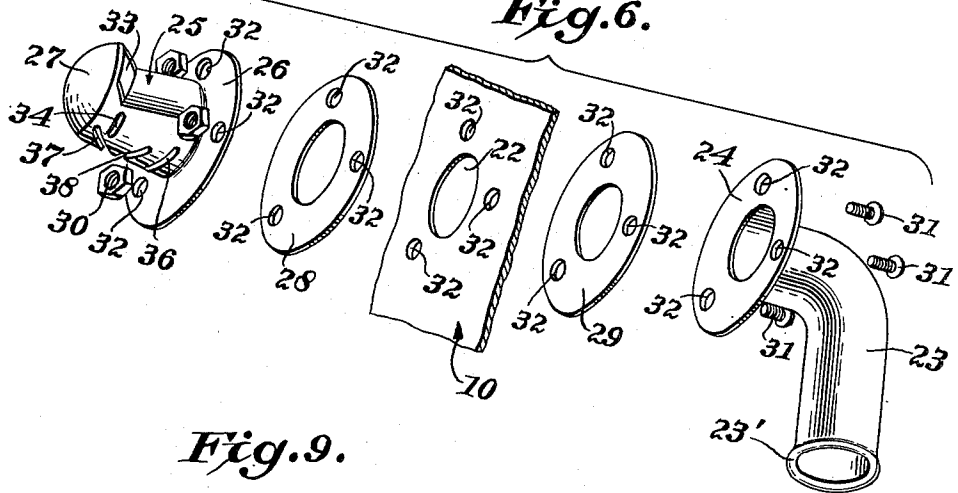
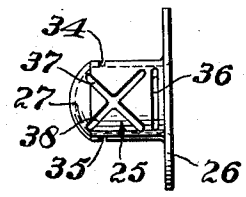


Fig. 9.



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UNITED STATES PATENT OFFICE

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FACE MASK OR SHIELD

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7 Claims. (Cl. 128—142)

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The present invention relates generally to the art of face protecting devices, masks or shields.

More particularly, it relates to a welder's mask or shield wherein means are provided for supplying fresh, cool or tempered air and for preventing the entrance of fumes or deleterious particles to the region adjacent to the mouth and nose of the wearer of the mask.

In known prior art masks of the type having a separate air hose for the supply of fresh air under pressure from an external source to the interior of the mask, it is customary to connect the hose directly to the lower portion of the mask. Where this is not done, and the hose is connected to the upper portion of the mask, the point of air discharge within the mask is usually also located in the upper portion thereof, which is undesirable. This is so for the following considerations: Since the mask is ordinarily pivotally connected to its headpiece and in normal use is frequently lifted or tilted about its pivot to permit the wearer to more accurately observe his work, as well as for other reasons, the direct connection of the air hose to the bottom of the mask presents a serious disadvantage due to the drag or pull which is exerted on the mask, tending to pull the mask downwardly about its pivot and forcing it against the face of the wearer. In such cases, the free end of the air hose is also usually carried under the arm of the welder, thereby impeding his freedom of movement, and reducing his working efficiency.

From another standpoint, it has been common practice in the past to employ auxiliary apparatus in conjunction with face shields of the type described herein in order to secure adequate protection to the wearer. For example, it is common for a welder to employ a face-engaging air mask in conjunction with goggles, thereby necessitating a number of independent adjustments of the various head and neck straps of each. Nevertheless, certain portions of the face are still left unprotected. On the other hand, known prior art masks affording relatively complete protection to the wearer are generally clumsy, comprising hoods which lack the feature of being readily and easily adjustable and are incapable of being tilted upwardly about the face of the wearer to permit frequent inspection of the work, changing of electrodes, or other operations.

It is, accordingly, an important object of the present invention to provide an improved welder's mask of the type having an external air supply hose and a pivotal connection with the head of the wearer, wherein the hose is attached to the mask adjacent to the pivotal connection and terminates in an air supply fitting in the lower central region of the mask, so that the mask may be freely tilted about the face of the wearer sub-

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stantially unimpeded by any drag due to the air hose.

Another object of the invention is to provide a welder's mask of unitary construction which may be freely tilted about the face of the wearer, and wherein fresh air is supplied under pressure to the lower central portion of the mask in such manner, as to form a continuous curtain flowing over and away from the face of the wearer in substantially all directions, to provide thereby air for breathing and for preventing entrance of fumes or deleterious particles into the interior of the mask.

A further object is to provide a freely tiltable welder's mask having a fresh air connection in its lower central portion so constructed as to supply air for breathing purposes indirectly to the nose and mouth region of the wearer.

Yet another object of the invention resides in the provision of a separable or detachable air connection or fitting which may be readily attached to existing ordinary welder's masks with but slight modification of the latter.

A still further object of the invention resides in the provision of a novel air deflector having a curved, closed inner end and provided with a major orifice and a plurality of minor slit orifices together extending around almost the full periphery of the deflector in such manner as to direct air discharged therefrom into a flowing curtain extending through substantially 360 degrees radially of the deflector.

Other and further objects and advantages of the invention together with a more complete understanding thereof will become more readily apparent from a consideration of the following detailed specification taken in conjunction with the accompanying figures of drawing wherein:

Figure 1 is a side elevational view of an improved welder's mask according to the present invention showing the same in operative position on the wearer;

Figure 2 is a front elevational view of the mask of Figure 1;

Figure 3 is a side elevational view similar to Figure 1 but showing the mask in raised or inoperative position;

Figure 4 is a side view similar to Figure 1 but showing the mask and headpiece in cross section taken substantially along the line 4—4 of Figure 2;

Figure 5 is a longitudinal cross sectional view of the air connection constituting a part of the invention, taken along the line 5—5 of Figure 2;

Figure 6 is an exploded perspective view of the air connection; and

Figures 7, 8 and 9 are, respectively, top plan, side, and bottom plan views in elevation, of the air deflector per se constituting a part of the air connection.

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Referring now in more detail to the drawings, and in particular to Figures 1 to 4 thereof, there is there illustrated a welder's mask comprising a main body 10 of a generally curved configuration adapted to substantially completely cover and protect the face of the wearer and including a transparent opening or window 11 in its upper central portion. The window 11 may be secured in place by any suitable means such as a lock frame 12 and rivets or screws 13 and is tinted in a proper shade to cut down light transmission in a manner well known in the art. A headpiece is provided for attaching the mask to the head of the wearer and includes a plurality of radial straps 14 terminating in a horizontal strap 15 of leather or the like, together forming a cap-like structure of conventional shape. A depending lug 16 is formed at each side of the horizontal strap 15 and these lugs carry pivots 17 on the outer ends of which the main body 10 is mounted. The engaging means between the main body 10 and the pivots 17 is preferably of the type which provides a small amount of frictional resistance to pivotal movement of the mask so that when once adjusted in either operative or raised position it tends to remain in that position until manually readjusted.

A clamping device in the form of a metallic spring clip 18 is attached to an upper side portion of the main body 10 adjacent to or, preferably forming a part of one of the pivots 17. This clip partially surrounds and firmly engages an air hose 19 the free end 20 of which extends over the shoulder of the wearer in an out-of-the-way position and is adapted to be connected to a source of fresh air under pressure (not shown), and the opposite end 21 of which extends downwardly terminating at the lower central portion of the main body over an air connection to be presently described. At least the portion 21 of this air hose is of some non-inflammable material as it is exposed to sparks and molten weld metal particles.

Referring now particularly to Figures 5 to 9, inclusive, the air connection comprises, in general, an inner and an outer element which are adapted to be connected together about opposite sides of an aperture 22 formed in the lower central portion of the main body 10 to form a through conduit for the admission of a controlled volume of fresh air to the interior of the mask. The outer element is preferably in the form of a short section or angle of bent tubing 23 having a flange 24 at its inner end adapted to be bolted or otherwise secured to the outer face of the main body 10, and having a raised bead 23' at its outer end adapted to firmly engage and be secured within the end 21 of the air hose 19. The inner element comprises a short straight deflector 25 of generally tubular shape having a flange 26 at its inner open end adapted to be secured to the inner face of the main body 10, and having an interiorly curved end cap 27 closing its opposite end. Inner and outer sealing gaskets 28 and 29 are preferably provided between the respective flanges 26 and 24 and the main body 10 to insure an airtight assembly, and any suitable means such as a plurality of nuts 30 and bolts 31 extending through holes 32 in the flanges, the gaskets, and the main body, may be employed to secure the elements together in assembled position. The outer periphery or side walls of the deflector 25 are provided with a plurality of orifices spaced longitudinally and circumferentially on the periphery thereof including an upper,

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generally rectangular, major orifice 33 located adjacent to the curved end cap 27, and a plurality of minor slit-shaped orifices 34, 35, 36, 37, and 38 the latter two of which intersect to form an X-shape. It will be noted that the major and minor orifices together are so spaced about the periphery of the piece 25 as to extend over an arc of almost a full 360 degrees for a purpose which will be more fully explained below.

The operation of the device is as follows: First of all the cap piece, consisting of the straps 14 and 15, is adjusted to snugly engage the head of the wearer in a comfortable fashion and when once properly adjusted, need not be removed so long as the welding or other operations are being carried on. Should the welder, as frequently occurs in practice, desire to halt his work momentarily to inspect the material in normal light, to change the welding electrode, or for any other cause, it is only necessary for him to raise the mask about its pivots 17 by overcoming the slight frictional resistance tending to hold the mask in position. After the mask has been raised, this same frictional resistance operates to retain it in raised position since there is substantially no drag or other force exerted by the air hose 19 tending to rotate the mask about its pivots. With the mask in proper position to provide adequate vision through the window 11, fresh air is supplied through the hose 19 from any suitable source to the air connection in the lower central portion of the mask, passing through the outer element or tubing angle 23, the aperture 22 in the main body 10, and into the inner element or deflector 25 whence it is discharged into the interior of the mask. The deflector 25 is so positioned on the inside of the main body 10, that the major orifice 33 faces upwardly and a large part of the air entering the deflector 25 is curved upwardly and slightly backwardly by the end cap 27, being discharged through orifice 33 against the inside of the main body 10, and is reflected therefrom to the region adjacent to the nose and mouth of the wearer thus constituting an indirect air supply for breathing purposes. The fresh air discharged from the major orifice 33 is in excess of the normal breathing requirements of the wearer and, consequently, serves to carry upwardly and out past the top peripheral edge of the mask the air exhaled by the wearer. The remainder of the air supplied to the deflector 25, is discharged through the minor orifices 34-38 in such manner as to complete an almost continuous curtain of flowing air extending in all directions radially of the deflector through approximately 360 degrees. The air thus discharged through the minor orifices is forced sideways and downwardly past the other peripheral edges of the mask so that, in conjunction with the air discharged through the major orifice 33, a continuous flowing stream of air under pressure is discharged around substantially all edges of the mask to prevent the entry of fumes or foreign particles to the interior thereof.

The main body of the mask and its component parts may be made of any suitable materials, such as metal, plastic, fibre or of a combination of materials as dictated by the particular conditions of use.

Numerous modifications, alterations, and deviations from the specific structures of the preferred embodiment, disclosed herein for purposes of illustration, will no doubt occur to one skilled in the art without departing from the spirit or

scope of the invention as set forth in the appended claims.

I claim:

1. A welder's mask comprising a main body adapted to substantially completely cover the face of the wearer and having a window in its upper central portion, means on the upper interior portion of said main body for attaching said mask to the head of the wearer, said means and said main body being pivotally connected, an air connection in the lower central portion of said main body having an air hose externally connected thereto for supplying fresh air to the interior of said mask, and air hose clamping means mounted on the upper exterior portion of said main body adjacent to and substantially coincident with the point of pivotal attachment of said first named means with the main body and clamping said air hose on the main body whereby said main body of the mask may be tilted about said first named pivotal connection and carry with it the clamped hose and this movement of the main body being substantially unimpeded by drag due to said air hose.

2. A welder's mask comprising a main body adapted to substantially completely cover the face of the wearer and having a transparent window in its upper central portion, an adjustable headpiece pivotally secured to the upper portion of said main body, a hose clip mounted on the upper portion of said main body adjacent to and substantially coincident with the pivotal structure for said headpiece and movable with the main body with respect to the headpiece, a flexible air hose attached to said clip and extending downwardly therefrom, and an air connection in the lower central portion of said main body including an external tubing angle having a flange at one end and a raised bead at its other end lying within and secured to the end of said air hose, means forming an aperture in the lower central portion of said main body, inner and outer gaskets, and a generally tubular air deflector on the interior of said main body having a flange at one end surrounding said aperture and secured to said gaskets, said main body and said tubing angle flange to form a substantially airtight conduit through said aperture for the transmission of fresh air from said air hose to the interior of said main body.

3. A welder's mask comprising a main body adapted to substantially completely cover the face of the wearer and pivotally mounted on an associated headpiece, a hose clip on the upper portion of said main body mounted adjacent to and substantially coincident with its pivotal mount and movable with said main body with respect to the headpiece, an air hose attached to said clip and extending downwardly therefrom, and an air connection in the lower central portion of said main body including an external tubing angle having a flange at one end and having its other end connected to said air hose, a generally tubular air deflector on the interior of said main body having a flange at one end, an aperture in said main body, inner and outer gaskets, and means securing said flanges and said gaskets around opposite sides of said aperture whereby to form a substantially airtight conduit for supplying air from said hose to the interior of said mask.

4. A welder's mask according to claim 1 wherein said main body is in the form of an open back face shield the peripheral edges of which are adapted to be spaced at substantially all points thereof an appreciable distance from the head of

the wearer, and wherein said air connection is disposed in said shield and constructed and arranged to supply fresh air to the interior of said shield in the form of a curtain extending radially approximately 360 degrees from said connection and discharging past the peripheral edges of said shield, whereby the admission of foreign particles to the interior of said shield is substantially prevented.

5. A welder's mask according to claim 1 wherein said main body is in the form of an open back face shield the peripheral edges of which are adapted to be spaced at substantially all points thereof an appreciable distance from the head of the wearer, and wherein said air connection is disposed in said shield and constructed and arranged to supply fresh air to the interior of said shield in the form of a curtain extending radially approximately 360 degrees from said connection and discharging past the peripheral edges of said shield, whereby the admission of foreign particles to the interior of said shield is substantially prevented and wherein means associated with said air connection are provided for directing a portion of the fresh air against the interior of said shield whereby to provide an indirect supply of fresh air for breathing purposes to the region adjacent to the mouth and nose of the wearer of the mask.

6. A welder's mask according to claim 1 wherein a generally tubular apertured internal air deflector is provided and wherein said deflector includes an interiorly curved end portion, an upwardly directed major aperture adjacent said end portion, and a plurality of minor apertures opening from the sides and bottom of said deflector whereby air may be discharged in proportioned volumes radially through an arc of substantially 360 degrees.

7. A welder's mask according to claim 1 wherein there is provided an air deflecting fitting on the interior of the main body, said fitting comprising a generally tubular member having a flanged open end adapted to be attached to a deflecting shield and an interiorly curved closed end, means forming a major orifice in the side wall of said member adjacent to said closed end substantially facing said deflecting shield, and means forming a plurality of minor orifices circumferentially and longitudinally spaced about the periphery of said member at least two of which intersect at an angle to form an X, said major and minor orifices being constructed and arranged whereby air may be discharged radially therefrom through approximately 360 degrees.

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