J. W. KNOBLOCK.

PURE AIR HOOD AND HELMET.

APPLICATION FILED MAY 22, 1920.

1,410,926. Patented Mar. 28, 1922.

3 SHEETS—SHEET 1.

Fig. 2.

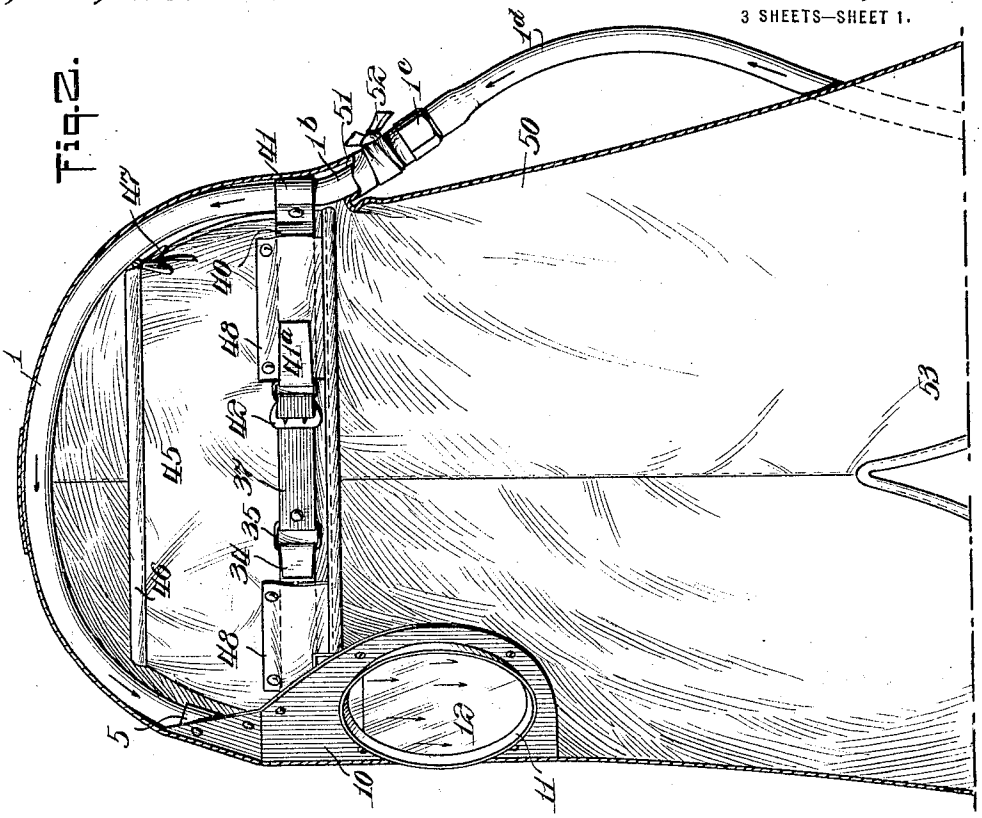
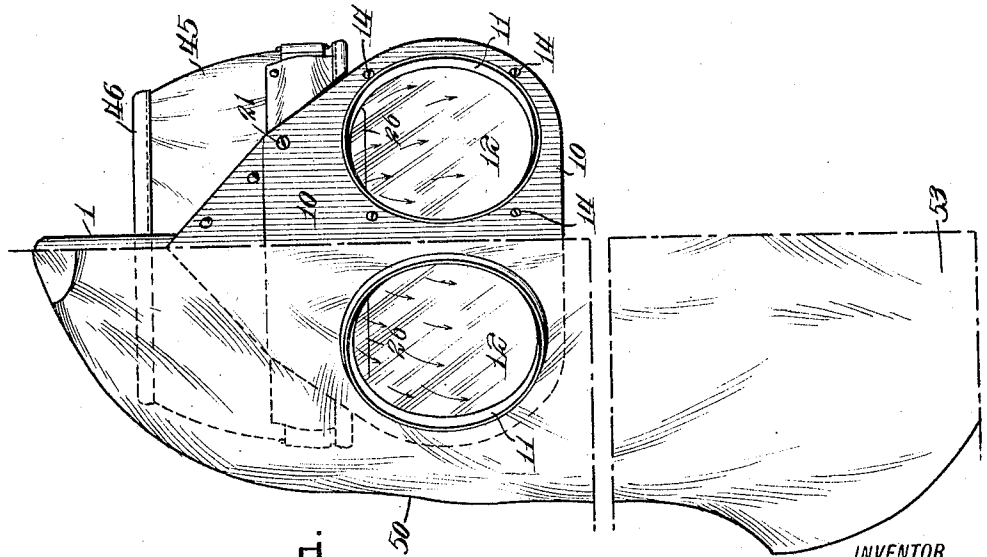


Fig. 1.



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3 SHEETS—SHEET 2.

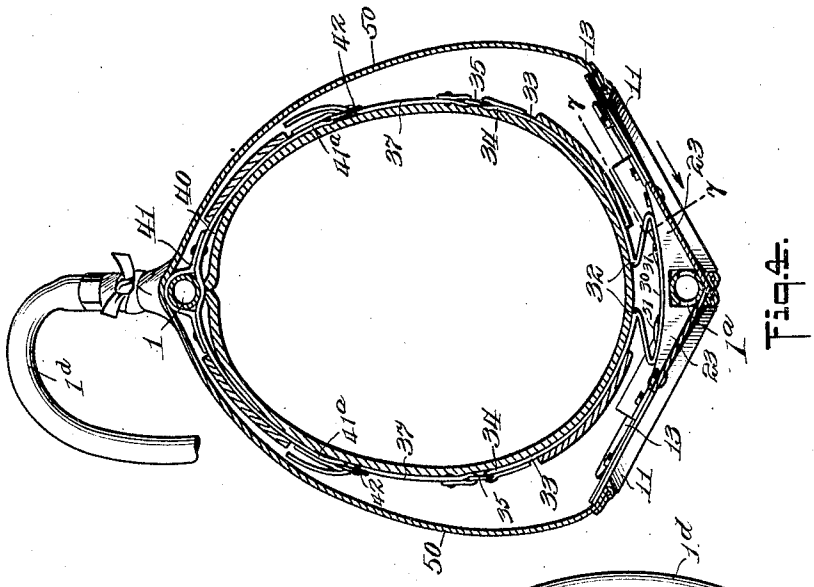


Fig. 4.

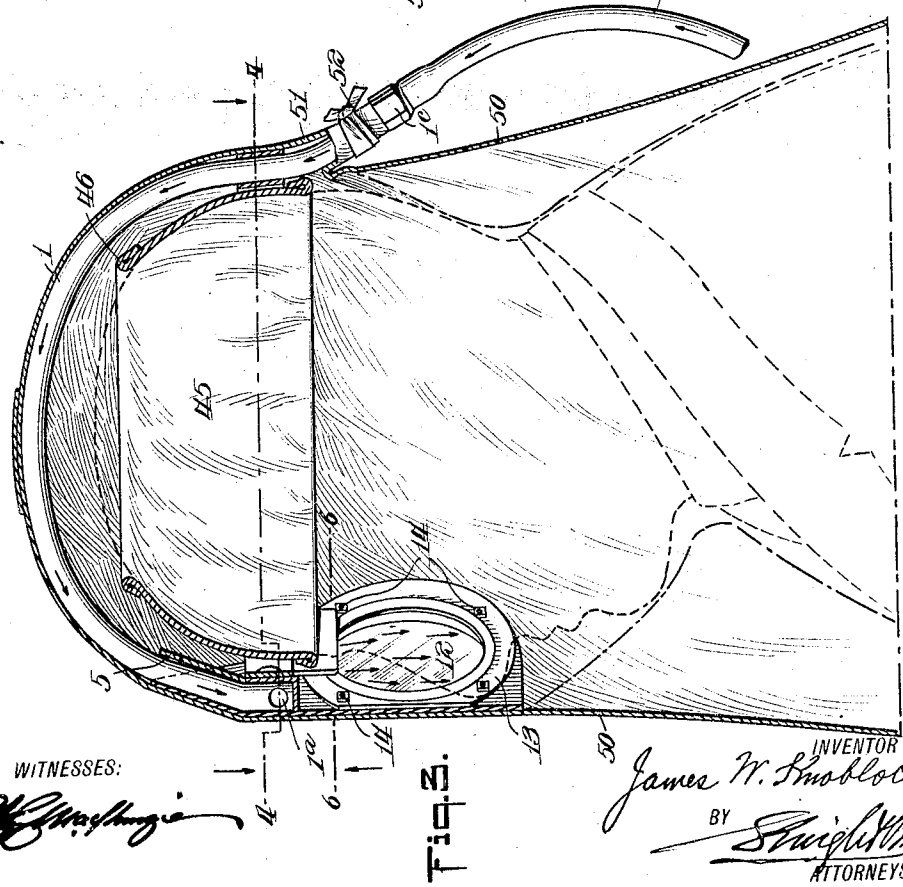


Fig. 3.

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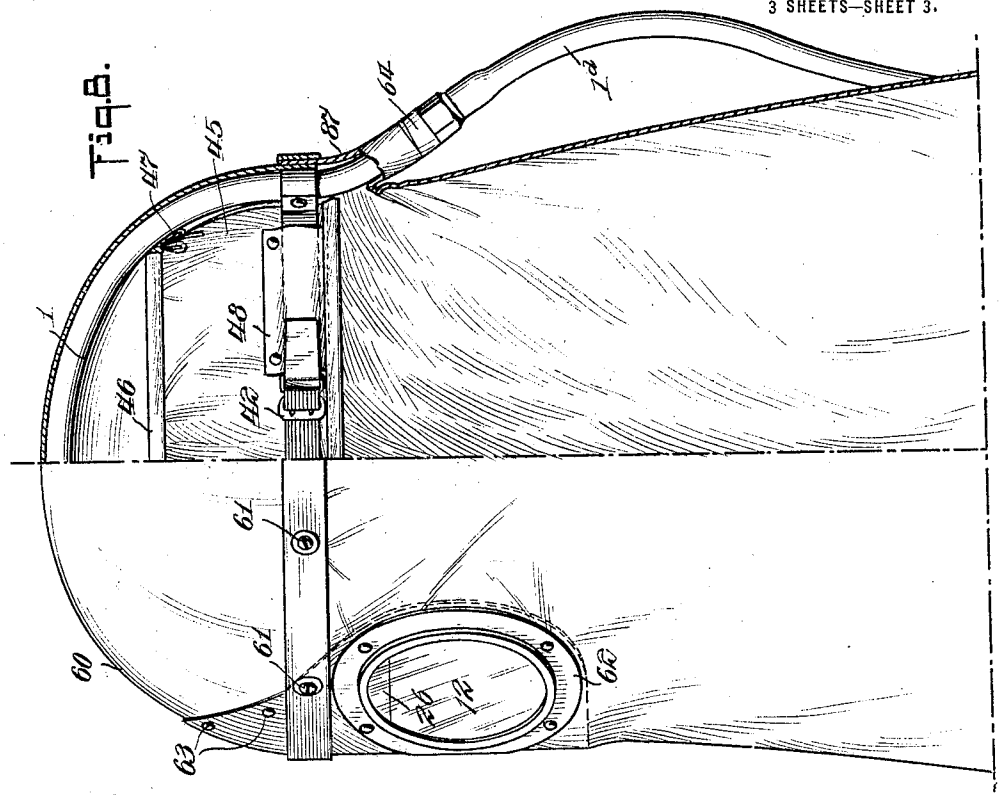
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3 SHEETS—SHEET 3.

Fig.8.



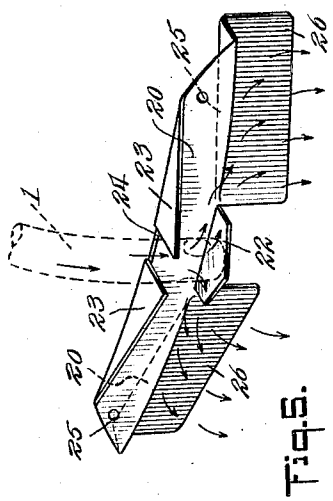


Fig.5.

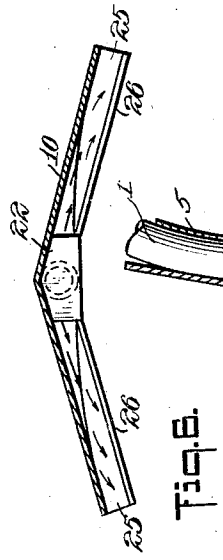


Fig.6.

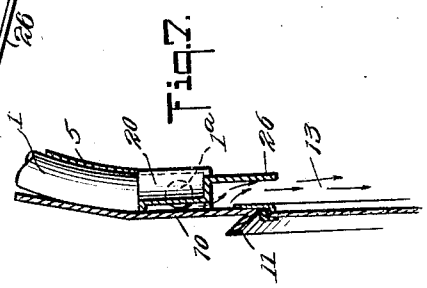


Fig.7.

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UNITED STATES PATENT OFFICE.

JAMES W. KNOBLOCK, OF ELMIRA, NEW YORK, ASSIGNOR TO AMERICAN LA FRANCE FIRE ENGINE CO., INC., OF ELMIRA, NEW YORK, A CORPORATION OF NEW YORK.

PURE-AIR HOOD AND HELMET.

1,410,926. Specification of Letters Patent. Patented Mar. 28, 1922.

Application filed May 22, 1920. Serial No. 383,547.

To all whom it may concern:

Be it known that I, JAMES W. KNOBLOCK, a citizen of the United States, residing at Elmira, county of Chemung, and State of New York, have invented certain new and useful Improvements in Pure-Air Hoods and Helmets, of which the following is a specification.

The present invention relates to improvements in pure air hoods or helmets which are employed in connection with air supply devices to protect the wearer who is working in the presence of any kind of poisonous or impure air. The protection in the use of this form or device is in the continuous supply of a proper quantity of pure air, thereby affording comfortable breathing to the wearer and by the excess of air under the hood or helmet to exclude the impure or noxious air and gases.

The present invention relates particularly to an improved head gear or harness for conveniently and comfortably supporting the protecting hood or helmet with its eye windows and the pure air supply pipe. The improved harness is equally applicable to a flexible hood or a rigid metal or other form of helmet.

In carrying out the purposes of the present invention the pure air supply tube to which the hood or helmet is directly attached is in the form of a curved metal tube shaped to extend above and over the head from the rear to the front of the crown, and having permanently secured to its forward delivery end an angular metal shield carrying two large framed eye windows designed to be supported in front of the eyes of the wearer in angular vertical planes so as to afford a wide range of vision. Secured to this angular plate or shield are suitable air deflecting plates, which divide the incoming current of air from the supply tube into two air currents that are deflected downwardly over the inner surfaces of the eye windows, with a view to maintaining both inner and outer surfaces of the window at approximately equal temperatures so as to reduce to a minimum the fogging of the windows. This curved metal air supply tube has a flexible air tube coupled to it leading from a suitable air supply which may be a reservoir of air under pressure or a suitable air pump. This flexible air tube is usually provided with a hand operated valve or cock by which the supply of air can be regulated.

To afford a convenient and comfortable means for supporting the air supply tube and eye windows in proper position upon the head of the wearer, I mount at the front and back of the curved metal tube light spring metal straps having their ends adjustably connected by elastic straps, and suitably mounted upon said spring metal straps is a skull cap or band shaped to fit snugly upon the human head and provided with one or more drawing strings to adjust its size within certain limits. This skull cap or band is provided with loops or cloth pockets to embrace the sheet metal straps and thereby connect the cap or band to the straps, and by said connection support the air tube, eye windows, etc., upon the wearer's head. The hood or helmet may be mounted upon the structure described in any suitable manner, the mounting being slightly different for each of these articles as hereinafter more specificially explained.

In order that the invention may be more fully understood it will first be described with reference to the accompanying drawings and afterward pointed out more particularly in the annexed claims.

In said drawings:—

Fig. 1 is a front elevation, partly broken away, of the improved head harness for hoods and helmets showing the present invention applied to a pure air hood.

Fig. 2 is a side elevation of the head harness shown in Fig. 1 representing the hood portion in section.

Fig. 3 is a vertical sectional view of the same representing in dotted lines the head of the wearer.

Fig. 4 is a horizontal sectional view of the same taken on the line 4—4 of Fig. 3.

Fig. 5 is a detail perspective view illustrating the detached air deflector within the shield of the head harness.

Fig. 6 is a sectional view of the same taken on the line indicated at 6—6 in Fig. 3.

Fig. 7 is a detail sectional view taken on the line 7—7 of Fig. 4.

Fig. 8 is a view similar to Fig. 2 showing the application of the invention to a pure air helmet.

1 is a metal tube gently curved from end to end to rest above the head of the wearer

without touching the same when mounted and supported as presently explained. This tube 1 constitutes a fresh air supply to the hood or helmet and also the main rigid element of the frame or head harness upon which the hood or helmet is mounted.

Secured to the front end of the curved metal tube 1 by means of an embracing plate or bracket 5 is an angular frontal shield or plate 10. This shield has two wings presented at an angle to each other in a vertical plane (when in use) and these two angularly arranged wings of the shield have formed in them large eye openings with outwardly presented flared flanges 11. Eye windows 12 are mounted in flanged rims 13 that are secured to the inner faces of the shield wings by means of screw bolts 14. These window rims are mounted concentrically with the outwardly flared rims 11 of the window openings.

The upper portion of the shield or plate 10 is suitably shaped to fit over the air tube 1 and receive the securing plate or bracket 5, which is riveted to the plate 10.

The inner end of the tube 1 is open and formed with two relatively large lateral ports or openings 1^a to deliver the current of air in two laterally extending streams.

Secured to the inner face of the angular shield or plate 10 above the eye windows 12 is an air deflector of peculiar design. This deflector is made of a single piece of sheet metal cut and bent to provide the elements now to be referred to. The main supporting flange of the deflector indicated at 20 is rigidly secured to the angular plate 10 by means of screw bolts 21. The wall of this plate 20 between its ends curves gradually away from the plate 10 to pass over the end of the air tube 1, a bottom baffle plate 22 shaped to fit into the angular recess of the plate 10 and substantially close the inner open end of metal tube 1, and the upper integral flanges 23 snugly engage the inner face of plate 10 and being centrally cut out as indicated at 24 to fit over the air supply tube 1. Bottom flanges 25 project from plate 20 and support downwardly presented deflector plates 26, which extend slightly over the upper edges of the eye windows 12. These flanges 25 are so shaped that the deflectors 26 will be supported parallel with the eye windows 12. In this way the supply of fresh air through pipe 1 is divided into two streams through the two lateral openings 1^a and deflected outwardly and downwardly over the surfaces of the eye windows to prevent the breath of the wearer from fogging said windows.

A U-shaped metal strap 30 is permanently riveted at 31 to the wall 20 of the air deflector and is formed with spring bends 32 and spreading spring arms 33, the ends of which are bent over to form spring hooks 34 to detachably engage loops 35 to which an elastic or other strap 37 is attached.

40 is a U-shaped spring metal strap rigidly secured to the rear end of air supply tube 1 by means of a strap loop 41 surrounding the tube 1 and riveted to the strap 40. This U-shaped strap 40 has its arms projecting toward the arms of the metal spring strap 30, the ends being bent to form flat spring hooks 41^a to receive the loops of buckles or other suitable fastening devices 42, which are designed to adjustably engage the elastic or other straps 37.

45 is a skull cap or band shaped as accurately as possible to fit the human head and provided with a drawing string hem 46 at its upper edge through which is threaded a drawing string or tape 47, by which the size of the cap or band can be adjusted within certain limits. This cap or band has secured to its sides cloth loops 48, which embrace the arms of the spring metal straps 30 and 40 for supporting the air pipe 1 and parts carried thereby in proper position upon the head of the wearer. When the metal straps are threaded through loops 48, the adjustable elastic straps 37 will be presented between pairs of loops 48 at the sides of the cap or band 45 in convenient position for adjusting. The spring metal straps 30 and 40 and elastic straps 37 are held by loops 48 adjacent to the lower edge of the cap or band 45, thereby in effect providing means for adjusting the sides of the lower edge of said band to comfortably fit the wearer.

In Figs. 1, 2 and 3 I have shown the improved head harness as it is applied to a pure air hood. The hood which is indicated at 50 is shaped to fit loosely over the head harness and rest mainly upon the pure air supply tube 1 at the crown. The hood is formed with bound eye openings that fit snugly around the flanged eye openings 11 of the angular shield plate 10. At the rear the hood is formed with a tubular neck 51 through which the rear end 1^b of pipe 1 extends and has screwed to it a suitable coupling such as shown at 1^c connecting up the flexible air supply tube 1^d which as stated above may lead from any suitable source of pure air. A tape or string 52 surrounds the tubular neck 51 and is tied tightly thereon to exclude impure air and gases at this point. The skirt 53 of the hood may be of any desired pattern to fit around the neck and over the shoulders of the wearer, and can be retained loosely in position by a strap or band (not shown), or by the coat of the wearer, it being understood that with this form of breathing protection the exhaled air escapes from beneath the skirt of the hood, while the supply of air for breathing is maintained through the air supply pipe as explained.

In Fig. 8 I have shown the improved head harness applied to a helmet form of covering. In this form the top of the hood as shown in Figs. 1, 2 and 3 is omitted and the skirts only of the hood are employed, the same being secured by screw bolts 61 to the lower edge of a shaped sheet metal helmet 60. The eye openings of the head covering are surrounded by metal rings 62 secured in place by screw bolts that pass through said rings, the fabric of the hood, the flanges of the window supporting rims and the angular shield or plate 10. The upper portion of the shield or plate 10 is riveted to the front of the helmet 60 as shown at 63. The tubular neck 87 of the hood is closely confined upon the rear end of metal tube 1 by means of a ferrule or collar 64. The helmet 60 is preferably shaped out of metal such as aluminum, but it will be understood that this part of the device may be made of any material that is suitable to provide the desired protection against falling objects.

The operation of the improved pure air hood or helmet will be clear without further explanation. The improved head harness for supporting the protecting head covering is light, strong and effective for accomplishing the desired purposes. The adjustments enable the wearer to fit the devices comfortably to his head. The novel arrangement of the air supply devices tends to reduce to a minimum the collection of moisture or fog upon the eye windows, and thereby increases the efficiency of the devices. The arrangement of springs between the flexible head band and connected air tube and shield support these parts yieldingly upon and separated from the head of the wearer, thereby reducing the effect of light shocks from falling objects and otherwise improving the comfort of the harness.

I claim:

1. A device of the character described comprising a rigid air supply tube adapted to extend over the head of the wearer, a shield secured to and depending from one end of said tube in position to rest in front of the face of the wearer, eye windows carried by said shield, a flexible head band suitably connected at the rear and front thereof with said tube and shield for supporting them, and a head protecting covering enclosing and resting upon said tube.

2. A device of the character described comprising a rigid air supply tube adapted to extend over the head of the wearer, a shield secured to and depending from one end of said tube, said shield having two angularly disposed wings adapted to rest in front of the eyes of the wearer, eye windows carried by said shield wings, a flexible head band suitably connected at diametrically opposed points with said tube and shield for supporting them out of touch with the wearer's head, and a head protecting covering enclosing and resting upon said tube.

3. A device of the character described comprising a rigid air supply tube shaped to pass freely from rear to front over the head of the wearer, a shield secured to and depending from the forward end of said air tube, said shield having two angularly disposed wings or sides, eye windows mounted in the angular wings of said shield in position to rest in front of the eyes of the wearer, an air deflector mounted upon the inner face of said shield in position to direct the incoming air downwardly over the inner surfaces of said eye windows, a flexible head harness suitably connected at the front and rear thereof with said air tube and shield for supporting them upon and out of contact with the wearer's head, and a head protecting covering enclosing and resting upon said tube.

4. A device of the character described comprising a rigid air supply tube adapted to extend over the head of the wearer, a shield secured to and depending from one end of said tube in position to rest in front of the face of the wearer, eye windows carried by said shield, a flexible head harness suitably connected with said tube and shield at diametrically opposed points, said harness including spring members arranged for yieldingly supporting the tube and parts carried thereby upon the head of the wearer, and a head protecting covering enclosing and resting upon said tube.

5. A device of the character described comprising an air supply tube adapted to extend over the head of the wearer, spring straps suitably connected to the ends of said tube in position to embrace the head of the wearer below the crown, a flexible head band mounted upon said spring straps and adapted to fit the head of the wearer and thereby support said air supply tube, a plate carrying eye windows mounted upon said tube, and a head protecting covering enclosing and resting upon said tube.

6. A device of the character described comprising an air supply tube adapted to extend over the head of the wearer, connected straps suitably connected to the ends of said tube in position to embrace the head of the wearer below the crown, a flexible head band mounted upon said straps and adapted to fit the head of the wearer and thereby support said air supply tube, a plate carrying eye windows mounted upon said tube, and a head protecting covering enclosing and resting upon said tube.

7. A device of the character described comprising an air supply tube shaped to pass over the head of the wearer, adjustably connected U-shaped spring straps suitably connected to the ends of said tube in posi-

tion to embrace the head of the wearer below the crown, a flexible head band mounted upon said straps and adapted to fit the head of the wearer and thereby support said air supply tube, an angular shield carrying eye windows mounted upon said tube and a head protecting covering enclosing and resting upon said tube.

8. A device of the character described comprising an air supply tube shaped to pass over the head of the wearer, adjustable straps suitably connected to the ends of said tube in position to embrace the head of the wearer below the crown, a flexible head band mounted upon said straps and adapted to fit the head of the wearer and thereby support said air supply tube, an angular shield carrying eye windows mounted upon said tube, flanges upon said shield surrounding said windows, and a head protecting covering enclosing and resting upon said head harness and formed with openings which fit over said end flanges.

9. A device of the character described comprising an air supply tube adapted to extend over the head of the wearer, metal straps connected respectively to the front and rear ends of said air tube, adjustable flexible straps connecting adjacent ends of said metal straps, a head band formed with loops that embrace said metal straps to support said tube, said head band being adapted to fit snugly upon the head of the wearer, a shield secured to and depending from the forward end of said air tube, eye windows mounted in said shield and an air deflector mounted upon the inner face of said shield in position to direct the incoming air downwardly over the inner faces of said eye windows.

JAMES W. KNOBLOCK.