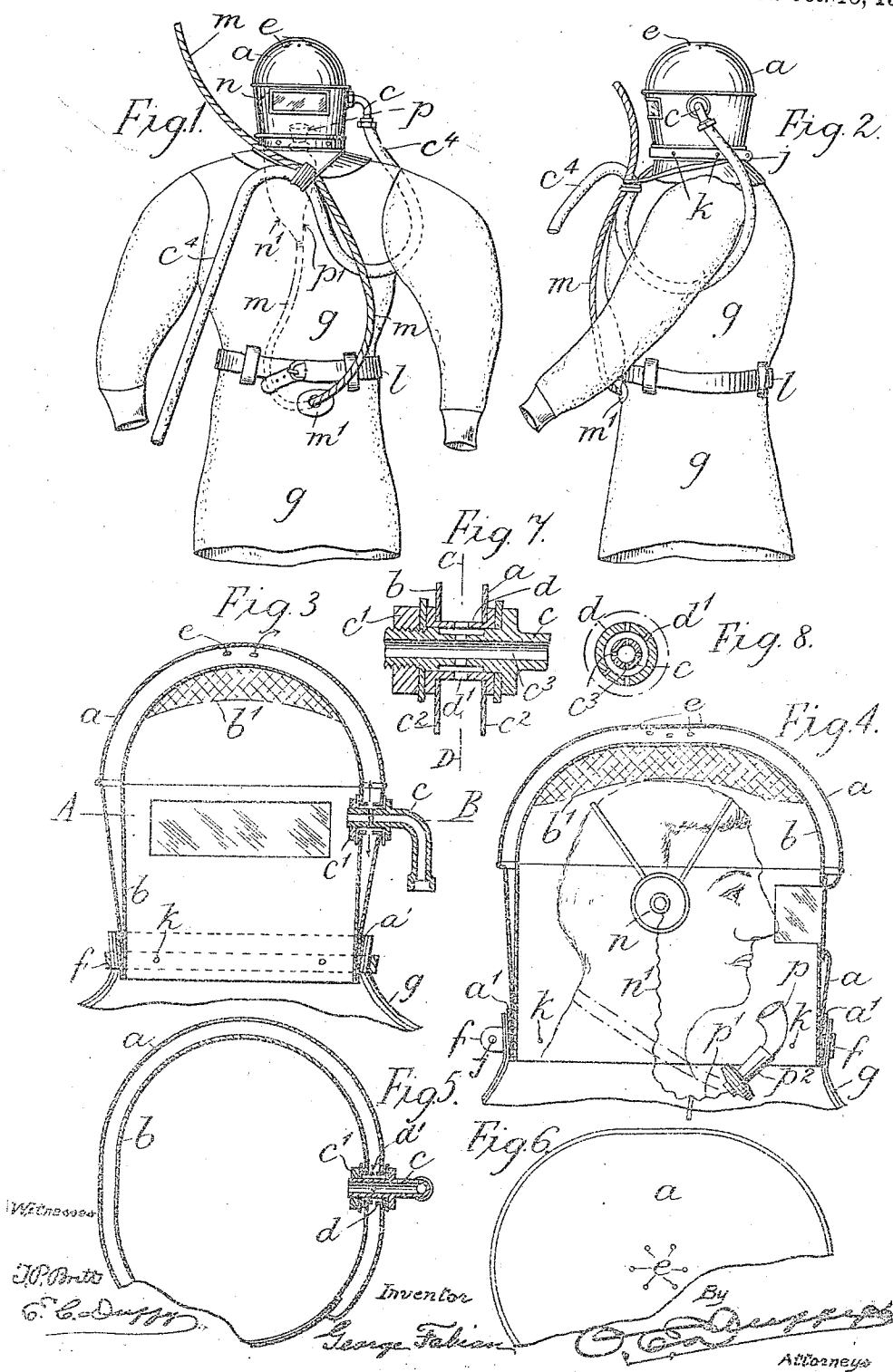


G. FABIAN.
FIRE HELMET.
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1,041,610.

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UNITED STATES PATENT OFFICE.

GEORGE FABIAN, OF BOOTLE, ENGLAND.

FIRE-HELMET.

1,041,610.

Specification of Letters Patent.

Patented Oct. 15, 1912.

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To all whom it may concern:

Be it known that I, GEORGE FABIAN, a subject of the King of Great Britain and Ireland, residing at Bootle, in the county of Lancaster, England, have invented Improvements in or Relating to Fire-Helmets, of which the following is a specification.

This invention has reference to improvements in the construction of a fire helmet attached to an inflatable sack coat or garment suitable for use in the presence of smoke and other noxious vapors, and to which fresh air is supplied in the usual manner by pumps or the like.

The object of the invention is to so construct such helmet with an inflatable waterproof coat that a large volume of air shall be retained to surround the upper portion of the wearer's body so as to some extent, prevent the person from becoming overheated by the radiated heat given off from the fire to be extinguished; and further, it may be, to allow a portion of the air supply to circulate in the hollow casing of the helmet and then escape therefrom through holes in the crown thereof; while the larger portion of the air supply shall pass between the body of the wearer and his body clothing, thus reducing the temperature to some extent which will allow the wearer to remain in action in a heated temperature for a long period. The air is discharged from the inflatable coat between the fireman's body and a belt that secures the coat around the waist of a wearer and by adjustment of which the discharge of air is controlled as described, so that a fireman can maintain air in the coat at a slight pressure such as to keep the coat inflated and form a heat insulating cushion between his body and the surrounding atmosphere.

Referring to the accompanying drawings, Figures 1 and 2 are front and side elevations respectively of the improved helmet with the waterproof coat attached thereto and inflated as when in use by a fireman; and arrangement of air supply pipe and life line or telephonic wire connections being shown in position. Figs. 3 and 4 are sectional elevations of the helmet to a larger scale in planes at right angles to one another. Fig. 5 is a sectional plan corresponding to the line A, B of Fig. 3. Fig. 6 is a plan of the helmet. Fig. 7 is an enlarged view of the swiveling end of the air supply pipe and Fig. 8 is a cross section corresponding to the line C, D of Fig. 7.

In the arrangement illustrated the helmet is slightly oval in plan and part spherical in the crown and is provided with a suitable glass covered sight opening formed in the inner and outer casings as shown. The outer casing *a* is made of thin copper or other suitable material and within this there is fitted a similar but somewhat smaller casing *b* also of copper or other suitable material, the relative sizes being such that there is left an air space of varying width between the two walls which are connected together at the open end of the helmet as shown in Figs. 3 and 4, the inner casing being externally flanged around its open end as shown so as to form a slight projection.

c is a short air supply pipe branch arranged to turn in any required direction, one end of which passes to the interior of the helmet through an enlarged bush *d* permanently fixed to the outer and inner casings *a* and *b* respectively. The bush or ferrule *d* is formed with a number of small holes *d'* (see Figs. 7 and 8) opening into the helmet wall air space. The inwardly projecting end of the air pipe branch *c* passes freely through the ferrule *d* leaving a suitable air space between the two parts and is held in position by a screw nut *e'* and a jointing washer *e''* so as to swivel into any desired position and remain air tight. That portion of the branch *c* within the ferrule *d* is formed with air holes *e'* to allow a portion of the air supplied to the helmet to escape and pass through similar holes *d'* in the ferrule *d* and circulate within the air space formed between the outer and inner casings of the helmet as hereinbefore described. Some portion of this air escapes through a number of fine perforations *e* formed in the crown of the outer casing *a*. The holes *e* are made very small so as not to admit any noxious gases or vapors to the fireman should the pressure of the air supply be reduced or be accidentally stopped. The outer end of the air supply pipe *c* is suitably formed for connection to the main air supply reservoir pipe *c'* shown in Figs. 1 and 2 and which passes under the arm of the wearer and is made fast by a cord around the base of the helmet.

Encircling the lower or open end of the helmet which is slightly flanged outwardly is a band or packing belt of rubber or canvas *a'* fixed thereto by a suitable solution and onto which the neck portion of a water-

proof coat *g* is placed and firmly gripped to the helmet by an encircling metal clip band *f*, and a clamping bolt *j* assisted by say four small bolts *k* which pass through the clip band *f*, the strengthened collar of the coat *g*, also the packing *a*¹ and casings *a* and *b* so as to insure a permanently fixed and air tight connection. The water-proof coat *g* is provided with slack fitting sleeves for the arms of the wearer and having flexible self closing cuffs at the wrists. The waterproof and air tight coat is made in sack form to take slackly on the shoulders, chest and arms of the wearer and of suitable length so that when a strap or belt *l* is drawn tightly around the body the upper portion of the coat will be practically made air tight between it and the usual clothing worn between such clothing and the body of the fireman wearing the helmet.

It will thus be understood that on air from a supply reservoir being admitted to the helmet it will cause the waterproof coat to become largely inflated thus forming an air space through which the heat from a fire when in close quarters will but slightly affect the temperature of the wearer and which will maintain a free breathing space around him. The metal helmet which entirely surrounds the head is also to some extent kept cool by the air space or cavity formed between the outer casing *a* and the inner casing *b*.

In some cases, in lieu of the before mentioned very small holes *e* in the crown of the outer casing *a* there may be provided a self closing non-return valve closed by a light spiral spring weighted or adjusted so as to close when the air pressure in the helmet and waterproof casing falls below the predetermined pressure.

The helmet, also a portion of the weight of the inflated coat, is carried or supported on a suitable cap or pad *b*¹, which rests on the fireman's head but on being inflated this weight is reduced as will be understood, and on the waist belt *l* being tightened on the dress the weight of the coat and helmet is practically removed from the head of the wearer thus leaving the head, neck and shoulders unencumbered and with ample air reservoir space around.

In some cases there may be employed with this arrangement of fire helmet a telephonic wire connection or cable *m* which enters or passes through the coat *g* at *m*¹ below the belt *l* and extends sufficiently inside the garment that the fireman can place a receiver frame or cage *n* on his head and to his ears and sling around his neck the transmitter or mouth piece *p*, before placing the helmet and inflatable coat in position over his body. The connecting wires *p*¹ and *n*¹ forming the wires of the cable *m* are within the jacket as shown by the dotted lines in Fig. 1. The

outer part of the cable *m* is preferably secured to the air supply pipe that passes across the chest of the fireman and the two are secured in the usual manner around his neck as clearly shown. The telephonic cable *m* may be employed as the life line for the fireman. The transmitter or mouth piece is connected with the diaphragm thereof by a piece of rubber or flexible tubing *p*² for convenience of the operator.

As a constant supply of fresh air is admitted, the partly breathed air escapes below the before mentioned waist encircling belt *l* through the usual clothing of the fireman at practically a lower temperature than the surrounding air thus to a great extent cooling his body when the apparatus is used when extinguishing fires in closely confined spaces such as in a ship's hold or the like. By regulating the tightness of the belt a larger or less supply of air is allowed to escape at will, also by thus regulating the air pressure a greater or less amount of air is discharged through the small holes *e* in the crown of the helmet.

A form of fireproof coat not shown is preferably worn over the waterproof coat to prevent damage thereto.

What I claim is:—

1. In protective apparel for use in the presence of fire, smoke and noxious gases, a helmet comprising an inner casing and an outer casing connected together at their lower ends and around a glazed sight hole formed therein, a tubular bush formed with perforations fixed in said helmet and extending from the outer casing to the inner casing thereof, and an air inlet branch mounted in said bush and communicating with the interior of said helmet, said branch being formed with perforations adapted to supply air to the space between the casings of said helmet through the perforations of said bush.

2. In protective apparel for use in the presence of fire, smoke and noxious gases, a helmet comprising an inner casing and an outer casing connected together at their lower ends and around a glazed sight hole formed therein, a tubular bush formed with perforations fixed in said helmet and extending from the outer casing to the inner casing thereof, and an air inlet branch mounted to rotate in said bush and communicating with the interior of said helmet, said branch being formed with perforations adapted to supply air to the space between the casings of said helmet through the perforations of said bush.

3. In a fire and smoke helmet an inner casing adapted to entirely but freely inclose the head of a wearer; an outer casing so much larger than said inner casing as to provide a space between the two said casings said casings being each formed with a

sight hole and the said outer casing being formed with a small perforation at its upper part, means for connecting said casings together in an air tight manner at their lower ends and around the sight holes of said casings, a tubular bush formed with perforations and extending from the outer casing to the inner casing thereof, and an air inlet branch mounted in said bush and communicating with the interior of said inner casing, said branch being formed with perforations adapted to supply air to the space between said inner and outer casings through the perforations of said bush.

4. In protective apparel for use in the presence of fire, smoke and noxious gases, a fire and smoke helmet comprising an inner casing adapted to entirely but freely inclose the head of a wearer, an outer casing so much larger than said inner casing, as to provide a cooling space in which air circulates between the two said casings said casings being each formed with a sight hole and the said outer casing being formed with a small air escape perforation at its upper part, and means for connecting said casings together in an air tight manner at their lower ends and around the sight holes of said casings, means for supplying air to the interior of the said inner casing of said helmet, means for supplying air to the space between the said casings of said helmet, a coat adapted to fit loosely upon a wearer and leave ample air space when inflated at a slightly higher pressure than the surrounding atmosphere, between the wearer and said coat said air space being in free communication with the interior of said helmet, and means under the control of the wearer adapted to allow air to escape from said coat.

Signed at Tower Buildings, Water street, Liverpool, England, this ninth day of December, 1910.

GEORGE FABIAN.

Witnesses:
F. M. C. SCOTT,
H. WILLIAMS.