A. BEYER.

Firemen's Suit.

No. 232,233. Patented Sept. 14, 1880.

Fig. 3.

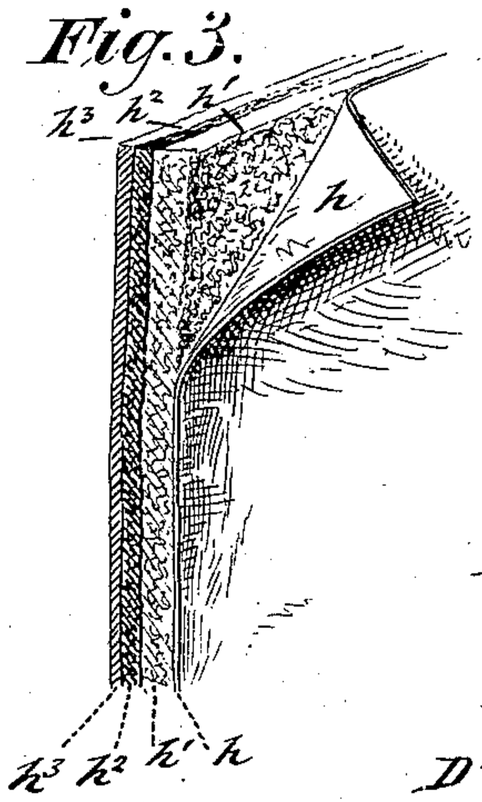

Fig. 1.

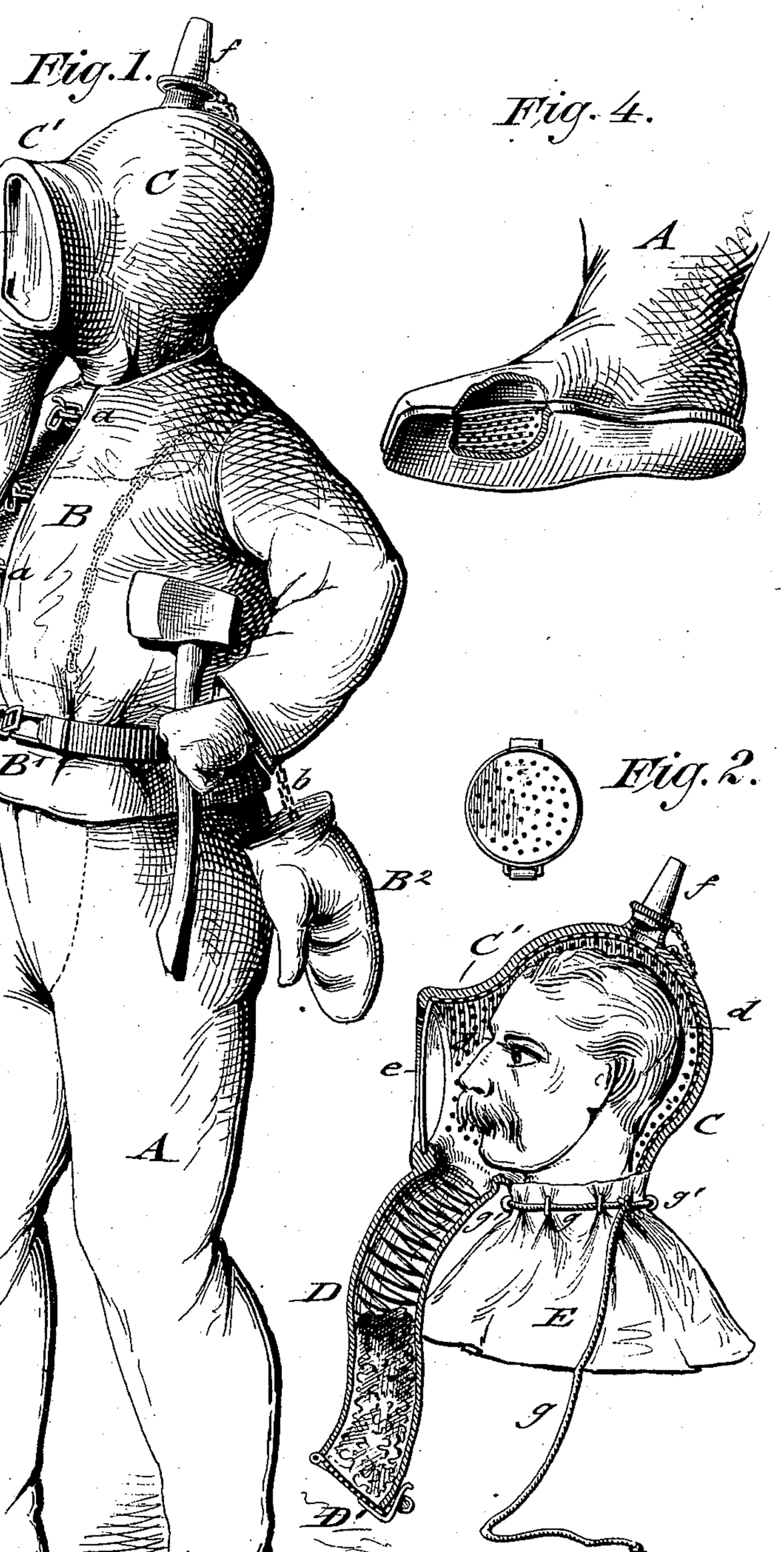

Fig. 4.

Fig. 2.

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FIREMAN'S SUIT.

SPECIFICATION forming part of Letters Patent No. 232,233, dated September 14, 1880.

Application filed February 16, 1880.

To all whom it may concern:

Be it known that I, AUGUST BEYER, of the city, county, and State of New York, have invented certain new and useful Improvements in Firemen's Suits, of which the following is a specification.

The object of this invention is to furnish for firemen's use, as well as for life-preserving purposes, an improved suit by which the wearer is fully protected against fire and smoke, so as to be able to approach closely to the fire and to pass through the same without danger of injury.

The protecting-suits which were heretofore in use were too cumbrous for practical purposes, as they required the connection by a water or air hose, or both, with an exterior water and air supply. The hose was liable to get entangled or otherwise out of order, so that the wearer of the suit was in imminent danger of getting burned or choked; besides, the hose-connection rendered the movements of the fireman less free and independent.

My invention is designed to supply to firemen a suit which is quickly put on, requires no special water or air supply, and makes the movement of the wearer entirely independent of any exterior connection.

The invention is based essentially on the use of materials which are good non-conductors of heat, and which supply a sufficient quantity of moisture at the inside to keep the body perfectly cool and thereby capable of resisting the scorching influence of the fire.

The invention consists more especially of a suit composed of pants, jacket, and helmet made of a fabric composed of an interior layer of heavy linen fabric coated with wax, of a thick intermediate layer of compressed wool mixed with charcoal, mineral wool, or a similar non-conductor of heat, of a covering layer of heavy woolen cloth, and of an exterior coating made of glue, red ocher, and sulphur. The helmet is stiffened by an interior frame of perforated sheet metal, the soles being strengthened in similar manner. The helmet has a projecting front portion with a glass window and a downwardly-extending trunk filled with moistened sponge. Below the helmet extends a cape, which is tied by a wire cord and inclosed by the jacket, which latter is fastened by metal eyes and hooks and by a belt of the same fabric as the suit. The trunk is stiffened by an interior coil of strong wire and closed at the lower end by a perforated cap.

In the accompanying drawings, Figure 1 represents a perspective view of my improved suit for firemen, shown as applied to the body for use. Fig. 2 is a vertical central section of the helmet. Fig. 3 is a detail vertical transverse section of the fabric of which the suit is made; and Fig. 4 a detail view of the foot-piece with part cut out to show the sole.

Similar letters of reference indicate corresponding parts.

In the drawings, A represents the pants, B the jacket, and C the helmet, of my improved fireman's suit or life-preserver. The pants A are made in one piece with the shoes and closed in front by a buckle and strap, the front parts overlapping sufficiently to form a tight joint.

To prevent any possibility of dropping the pants, they are furthermore provided with suspenders made of light metallic chains.

The jacket B fits tightly around the lower part of the helmet, one side overlapping fully the other and being closed by means of metal hooks and eyes *a a*, as shown in Fig. 1. The jacket B is also tightly closed over the pants by a belt, B′, having a metallic buckle, the belt being made of the same material as the suit, and arranged for carrying a hatchet, rope, &c.

To the ends of the sleeves are hung, by short chains *b*, the gloves B^2, which are made of the same fabric as the suit and extended sufficiently backward so as to fit tightly around the sleeves when properly drawn up over the same.

The helmet C is stiffened by an interior frame, *d*, of perforated sheet metal, which is made large enough to leave an air-space of an inch or an inch and a half all around the head to admit the free and easy motion of the head.

A forward-projecting front portion, C′, of the helmet forms a cooling air-space of three or four inches in front of the face, and is closed by a mask or front, *e*, of hardened glass, mica, or similar transparent material, which is not affected by heat.

From the lower part of the projecting front portion, C′, extends downward a trunk, D, which is stiffened by an interior spiral spring of wire of about the thickness of the common mattress-springs. The trunk D is closed at the lower part by a hinged or otherwise detachable cover, D′, of perforated sheet metal, said cover being locked in any suitable manner to the trunk. The lower half of the trunk is filled with sponge or other porous material, which is soaked in water before use. The moistened sponge purifies the air of smoke and cools the same, so that pure and cool air is supplied to the interior of the helmet. The wearer of the suit is thereby enabled to pass through the smoke without any danger of choking.

The trunk extends downward to a certain distance, so as to expose the air drawn through the sponge to a large cooling-surface, and also so as to facilitate the moistening of the sponge by dipping the trunk into a bucket of water in case it is required, either before or during exposure to the fire.

At the top of the helmet is an exit-opening and discharge-tube, *f*, for the escape of the vitiated air, the tube being screwed into a socket of the helmet and connected thereto by a chain.

The helmet C is secured to the neck by means of a cape, E, which extends over the shoulders and down over the front and back of the chest, said cape being firmly tied by a cord, *g*, of gold or other wire, which is passed through eyes *g′* of the cape. The soles of the shoes are also stiffened by interior sole-plates of perforated sheet metal, as shown in Fig. 4.

The suit itself is made of a compound fabric, which is shown in detail in Fig 3, and which consists of an inner layer, *h*, of heavy linen, which is coated on the outer surface with wax. Onto the linen fabric is basted a heavy layer, *h′*, formed of compressed animal wool which has been thoroughly mixed with charcoal, mineral wool, or a similar non-conductor of heat, so that the same is thoroughly incorporated therewith. A layer, h^2, of heavy woolen cloth covers the intermediate layer of wool, the woolen cloth being coated on the outside with a thick layer formed of a mixture of glue, red ocher, and sulphur. This exterior coating is prepared in the proportion of one-fourth part of glue to two parts of red ocher and one part of sulphur. This layer is renewed from time to time, especially after a fire, it being laid on with a brush. The seams are all sewed with wire and carefully covered with the plastic mass. The glue imparts to the mass a certain elasticity, while by the action of the heat it melts like the sulphur and forms a yielding mass with the red ocher, which resists the fire, it being only affected on the surface.

The heat of the fire on the covering-layer develops moisture from the wool and wax, which keeps the inside of the suit and the body cool, the wax imparting the required pliability to the suit. The outer layer is also water-proof, and protects the non-conducting layer of wool and the body against the influence of fire and water. The fireman may thus move about in a fire without danger from heat and smoke, so as to be in a condition to approach closely to the fire, or even pass into or through the same, so as to get it soon within control, and also to enable him to save people in danger of burning.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A fireman's suit composed of a pair of pants, a jacket, and of a helmet with exterior air-trunk and interior cape, all made of water and fire proof material, substantially as set forth.

2. In a fireman's suit, a pair of fire and water proof pants having interior perforated sheet-metal soles, substantially as specified.

3. In a fireman's suit, a pair of pants made of fire and water proof material, and attached by an exterior strap and buckle and by suspender-chains to the body, substantially as and for the purpose set forth.

4. In a fireman's suit, a jacket made of fire and water proof material, and secured tightly to the body by a belt of the same material and by metallic hooks and eyes, substantially as set forth.

5. In a fireman's suit, the combination of a jacket made of fire and water proof material, with gloves of the same material connected thereto by chains, substantially as described.

6. In a fireman's suit, a helmet, C, made of water and fire proof material, and provided with a forward-extending front portion, C′, and a downwardly-extending trunk, D, all as set forth.

7. In a fireman's suit, a helmet, C, of fire and water proof material, provided with a cape, E, of the same material, said cape being tied to the neck by a wire cord, *g*, substantially as set forth.

8. In a fireman's suit, the helmet C, of fire and water proof material, being stiffened by an interior frame of perforated sheet metal, substantially as specified.

9. In a fireman's suit, the helmet C, of fire and water proof material, having a forward-extending portion, C′, with a transparent front, *e*, substantially as described.

10. In a fireman's suit, a helmet, C, provided with a trunk, D, being partly filled with sponge and closed by a perforated cap, D′, substantially as set forth.

11. In a fireman's suit, a helmet, C, having an air-orifice and discharge-tube, *f*, at the top of the same, substantially as set forth.

12. As a new material for firemen's suits, a fire and water proof fabric composed of an inner wax-coated fabric, of an intermediate layer of compressed wool mixed with charcoal or

other non-conductor of heat, of a covering layer of wool, and of an exterior fire and water proof coating, all substantially as specified.

13. An exterior coating composition for firemen's suits, composed of red ocher, glue, and sulphur, substantially as described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 2d day of February, 1880.

AUGUST BEYER.

Witnesses:
PAUL GOEPEL,
CARL KARP.