G. A. MORGAN.

BREATHING DEVICE.

APPLICATION FILED AUG. 19, 1912.

1,113,675.

Patented Oct. 13, 1914.

2 SHEETS—SHEET 1.

Fig. 1

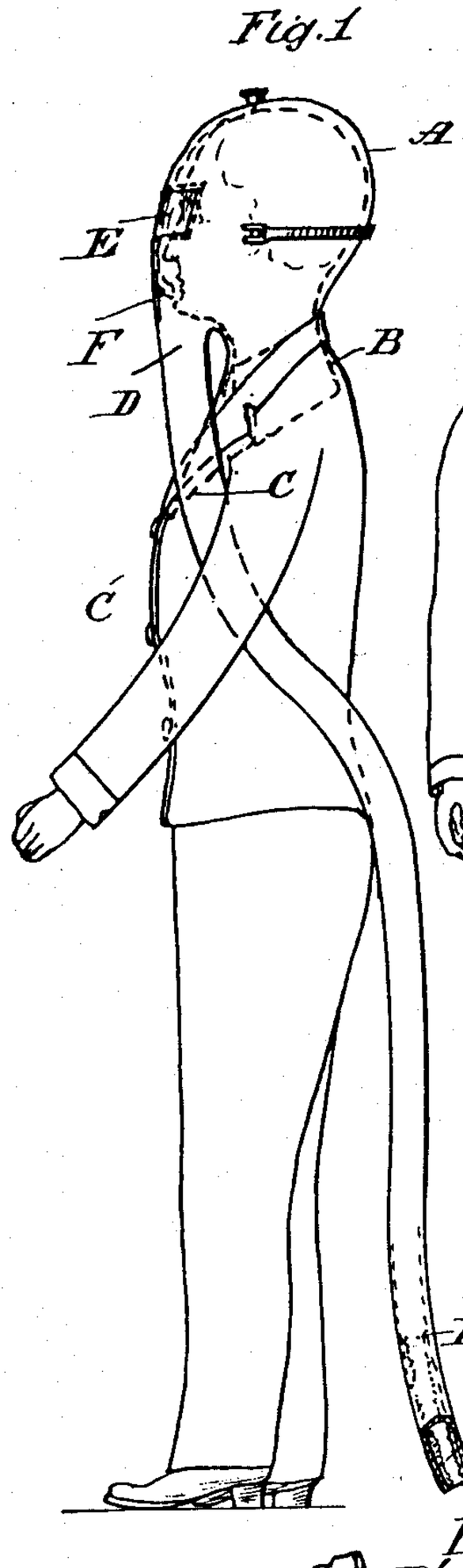


Fig. 2

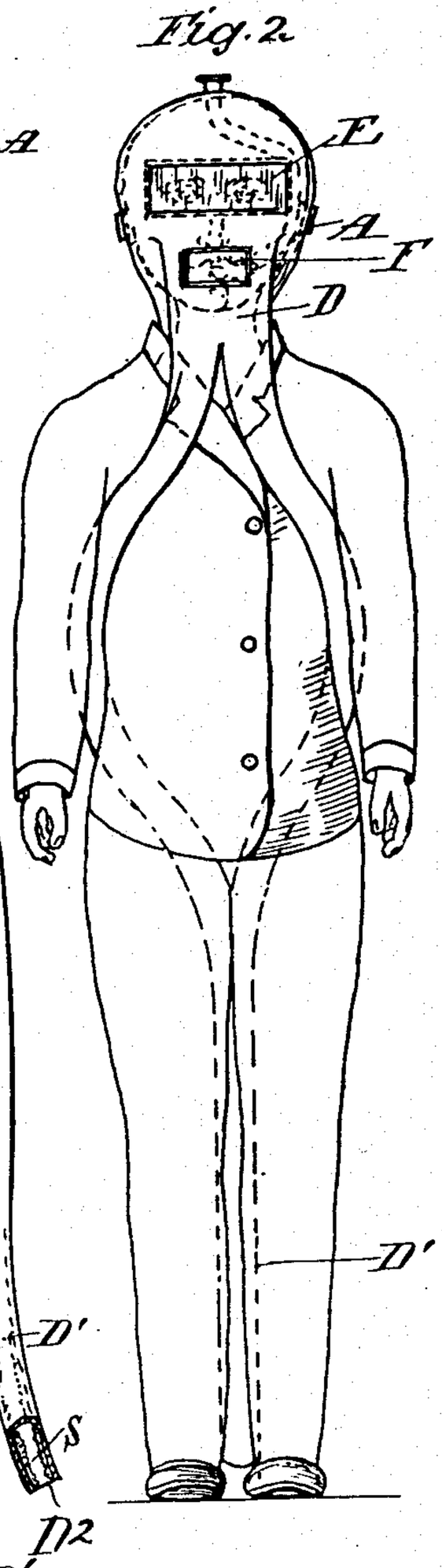


Fig. 3

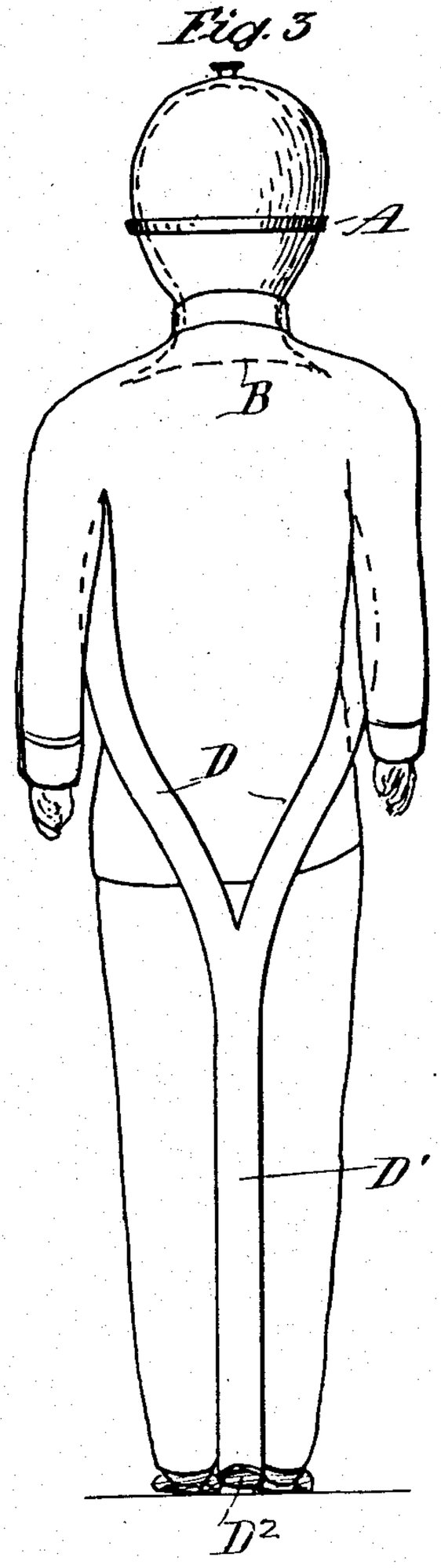


Fig. 4a

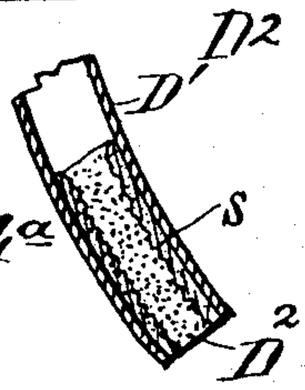
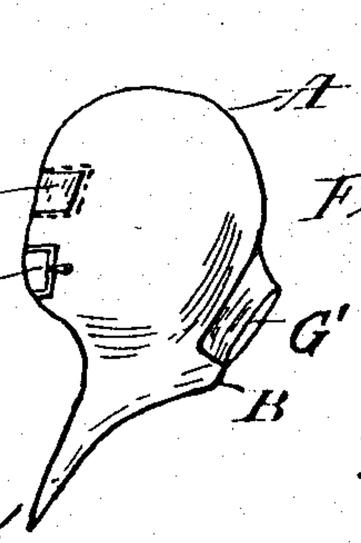


Fig. 4.



Witnesses

R. R. Cheeks

Mark Bordenkircher

Inventor

Garrett A. Morgan

Wm. H. Monroe

Attorney

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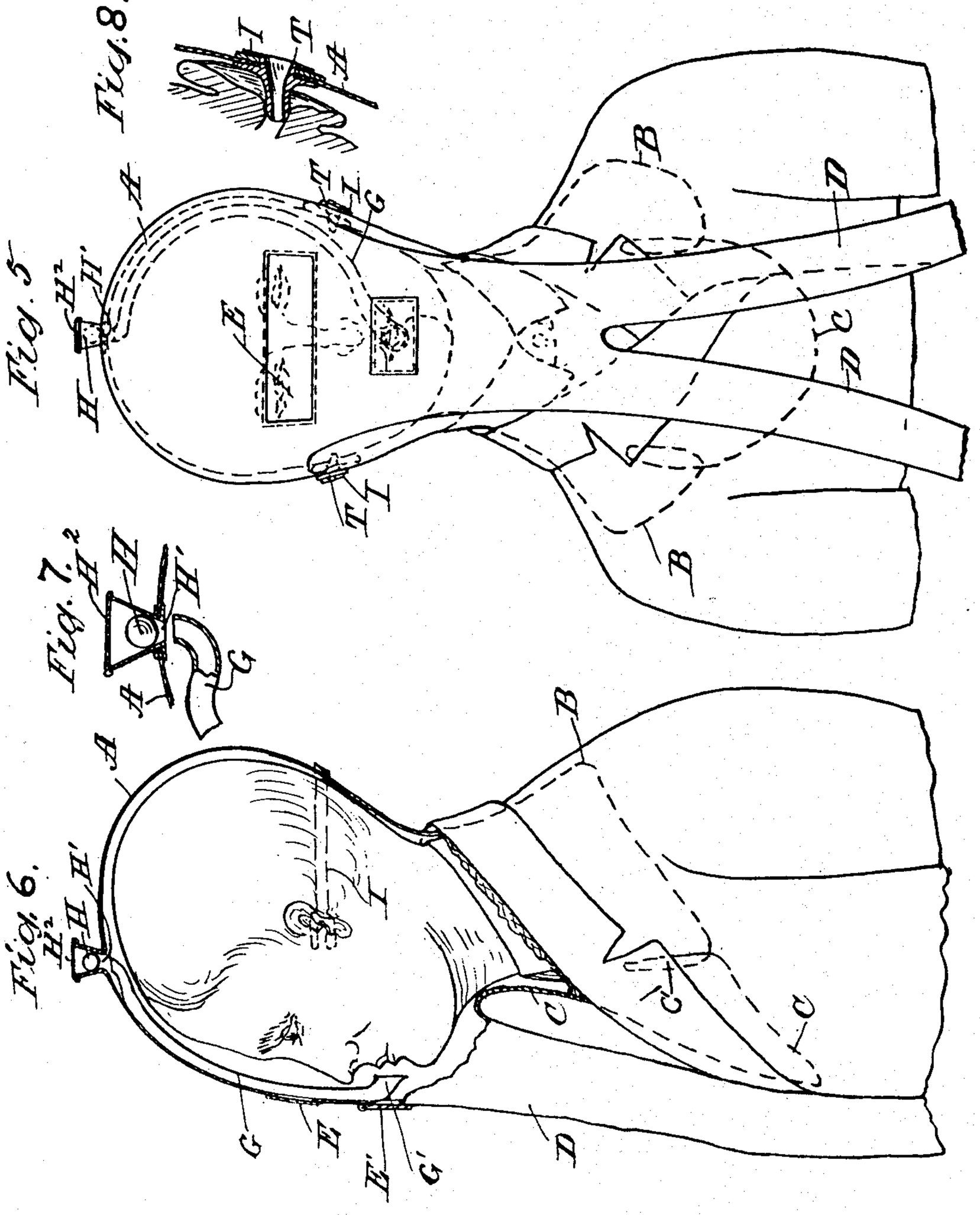
2 SHEETS—SHEET 2.



Witnesses
Marie Bodenkircher
Geo. L. Cook

Inventor
Garrett A. Morgan
by Wm. H. Norton
Attorney

UNITED STATES PATENT OFFICE.

GARRETT A. MORGAN, OF CLEVELAND, OHIO, ASSIGNOR TO THE NATIONAL SAFETY DEVICE COMPANY, OF OBERLIN, OHIO, A CORPORATION OF OHIO.

BREATHING DEVICE.

1,113,675. Specification of Letters Patent. Patented Oct. 13, 1914.

Application filed August 19, 1912. Serial No. 715,697.

To all whom it may concern:

Be it known that I, GARRETT A. MORGAN, a citizen of the United States, and resident of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Breathing Devices, of which I hereby declare the following to be a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

The objects of the invention are to provide a portable attachment which will enable a fireman to enter a house filled with thick suffocating gases and smoke and to breathe freely for some time therein, and thereby enable him to perform his duties of saving life and valuables without danger to himself from suffocation.

The device is also efficient and useful for protection to engineers, chemists, and working men who are obliged to breathe noxious fumes or dust derived from the materials in which they are obliged to work.

The invention has for its further objects to provide a device which can be quickly and easily attached and carried upon the person without the delay caused by buckling straps or the use of fastening devices of any kind and thus will be serviceable for immediate use in emergencies, since a little delay will often endanger life beyond recovery.

The invention comprises a hood to be placed over the head of the user, from which depends a tube provided with an inlet opening for air and the tube is long enough to enter a layer of air underneath the dense smoke within the hall or apartment entered by the fireman, and which can be placed beyond the reach of gaseous fumes or dust, and through which pure or much purer air can be furnished to the user. The hood is also provided with an appliance enabling the operator to hear clearly what is going on about him.

The invention further consists in the combination and arrangement of parts and manner of construction of the various details hereinafter described, shown in the accompanying drawings and specifically pointed out in the claims.

In the accompanying drawings Figure 1 is a side elevation of the preferred form of the device arranged in position upon the head and body of a fireman; Fig. 2 is a front elevation of the same and Fig. 3 a rear elevation thereof; Fig. 4 is an elevation of a modified form of hood; Fig. 4ª is a section of inlet tube; Fig. 5 is a front elevation of the hood enlarged; Fig. 6 is a vertical section of the hood enlarged; Fig. 7 is a vertical section of the outlet valve and exhaust pipe, and Fig. 8 is a vertical section of the hearing tube.

In these views A. is a hood formed of flexible material impervious to water and gas such as rubber cloth, and it can also be made of fire resisting material such as asbestos cloth if desired.

The hood is provided with a downwardly and rearwardly extending flap B which can be inserted underneath the coat to prevent gases or dust from entering the hood. At the front of the hood and communicating with the space in front of the face are the tubes D. D. which pass downwardly around the waist, on both sides of the body, so as to rest upon the hips and there unite behind the body to form a single tube D^1. This tube D^1 depends behind the wearer so as to be out of the way of his hands and feet, and not impede his movements, and at the lower extremity it is provided with the opening D^2 which will fall with the tube to a lower level than the body, and hence will enter a zone or layer of comparatively pure air, since when the upper part of the room is filled with fumes or gas to the point of asphyxiation the lower portion of the room will be comparatively free from smoke for some time, enabling a quick exploration of the room to be accomplished, and quick rescues performed.

In other situations where the noxious gases are heavier than air the mouth D^2 of the tube can be elevated above the level of the gas. This tube may be of any length desired but for ordinary use the length shown just avoiding the floor will be sufficient.

The device as shown, is easily and quickly attached to the body by placing the head and shoulders through the loop formed by the tubes D, and is supported upon the hips by means of this encircling loop, and in the use to which a fireman would put it the extremity of the tube will trail naturally behind the wearer, thus leaving the arms and feet

unimpeded in their action, and free for use. The appliance can be adjusted to the head and body in a few seconds.

An additional advantage is obtained by the use of the loop which encircles the body, since the inlet passage is duplicated at the sides of the body and if one portion should become compressed or closed by one arm when working in the building removing obstructions or when carrying out an injured or suffocated person the fireman could breathe freely through the other portion.

The tubes D extend downwardly from the front of the hood and to prevent smoke or gas from entering the hood behind these tubes an apron or flap C. joins the upper and inner edges of the tubes and extends downwardly over the throat and chest. This flap and the flap B overlap at C^1 and are inserted underneath the collar of the coat and when the coat is tightly buttoned no smoke can get underneath the flaps into the hood, and no elastic or collar or other appliance is necessary that might interfere with free respiration.

To improve the quality of the air entering the mouth D^2 of the tube, the smoke and dust which might enter the tube are retarded in the following manner: The lower end of the tube is lined for some distance with an absorbent material such as sponge S. which is moistened with water before using the appliance. This serves to keep the air moist at the entrance to the tube and checks the ascent of smoke and dust up the tube and also tends to freshen the air entering the tube by adding a cooler temperature to the air and also supplying oxygen in the vapor. A piece of some transparent material such as mica can be inserted at E in the hood to enable the wearer to see clearly, and a door F. over the mouth permits of supplying fresh air to the hood quickly in case of need and when the wearer is not in the gaseous atmosphere. Mica can be readily cleaned and will not be affected by a comparatively high degree of temperature.

At G is shown a tube placed inside the hood and provided with a mouth piece G^1. This tube extends to the upper end of the hood and when the used air from the lungs is discharged into this tube it will act upon a light ball H. in an opening H^1 at the top of the hood and raise it. This ball closes the opening H^1 and when raised the draft from the mouth will produce a current through this opening which will draw all the foul air from the upper end of the hood and will increase the draft through the air, inlet tube D^1 by suction. In this manner the entrance of fresh air can be placed under the control of the operator, who can force in fresh air at any time by blowing into the tube G. A net H^2 prevents the escape of the ball.

To enable the operator to hear readily what is going on about him, or the signals of the chief, small ear trumpets T. T. are inserted in the sides of the hood and when the hood is put in place the inner extremities of these ear trumpets are inserted in the openings in the ears.

To insure that smoke tight joints are obtained about these trumpets and to prevent them from slipping out of the ears, a light spring I can be placed over the back, of the head or secured to the hood, the ends of which press the trumpets inwardly.

In Fig. 4 a modification is shown in which a short tube G; extends from the rear of the hood and which would be efficient for the protection of chemists or workmen whose work creates a dust or fumes or gases which do not extend so far to the rear.

Modifications in the shape or construction of parts may be in the device without departing from the scope of the claims.

Having described the invention what I claim as new and desire to secure by Letters Patent is:

1. The combination with a fireman's hood, of a device for supplying air thereto, said hood provided with an outlet opening in its upper end; a gravity valve in said opening, a tube having an inlet opening within said hood into which the wearer can exhale his breath, said exhaling tube having its outlet opening opposite the outlet opening for the hood and spaced therefrom, substantially as described.

2. The combination with a fireman's hood, of a tube for supplying air thereto, a separate tube into which the air exhaled by the wearer is discharged, and having an inlet opening arranged opposite the mouth of the wearer, and having an outlet opening at the upper end of the hood but spaced therefrom, the wall of said hood having an outlet opening opposite the outlet opening in said exhaling tube but spaced therefrom, and a gravity valve in the outlet opening in said hood.

3. The combination with a fireman's hood, of an air inlet therefor, an exhaling tube arranged within the hood, and having an outlet opening located within the hood, said hood having an outlet opening located opposite the outlet opening in said exhaling tube.

4. The combination with a fireman's hood provided with inlet and outlet openings, of an appliance located within the hood and controlled by the breath of the operator, for creating a circulation of fresh air in the hood.

5. In combination with a hood having an opening in its upper end, of a pair of flexible breathing tubes connected with the lower front face thereof, said tubes joined together intermediate of their ends, forming a loop of sufficient size to embrace the body of a

fireman and rest upon his hips, and a single tube communicating with said pair of tubes at their point of juncture, and adapted to depend behind the wearer.

6. The combination of a hood adapted to extend over the head of the wearer, an air tube leading downward from a point adjacent to the mouth of the wearer and then dividing into two passageways adapted to extend onto opposite sides of the wearer's waist and rest on the hips, said tube merging into a single tube at the rear.

7. In a fireman's protecting device, the combination of a hood, means for supplying air thereto, and means operated by the breath of the fireman for forcing out exhausted air from the hood.

8. The combination of a hood, an air supply pipe thereto, and a pipe carried by the hood and having an entrance substantially opposite the mouth of the wearer of the hood and an exit near the upper end of the hood, there being an opening from the hood adjacent to such exit, whereby air blown through the tube may exhaust air from the hood.

9. In a fireman's protecting device, the combination of a hood adapted to extend over the head of the fireman and provided with a cape adapted to lie beneath the fireman's coat collar, an air pipe leading downward from the forward side of the hood and dividing into two tubes, said tubes coming together at the rear in such position that they are adapted to rest on and be supported by the hips of the wearer.

In testimony whereof, I hereunto set my hand this 14th day of August 1912.

GARRETT A. MORGAN.

In presence of—

WM. M. MONROE,

C. L. CASE.