

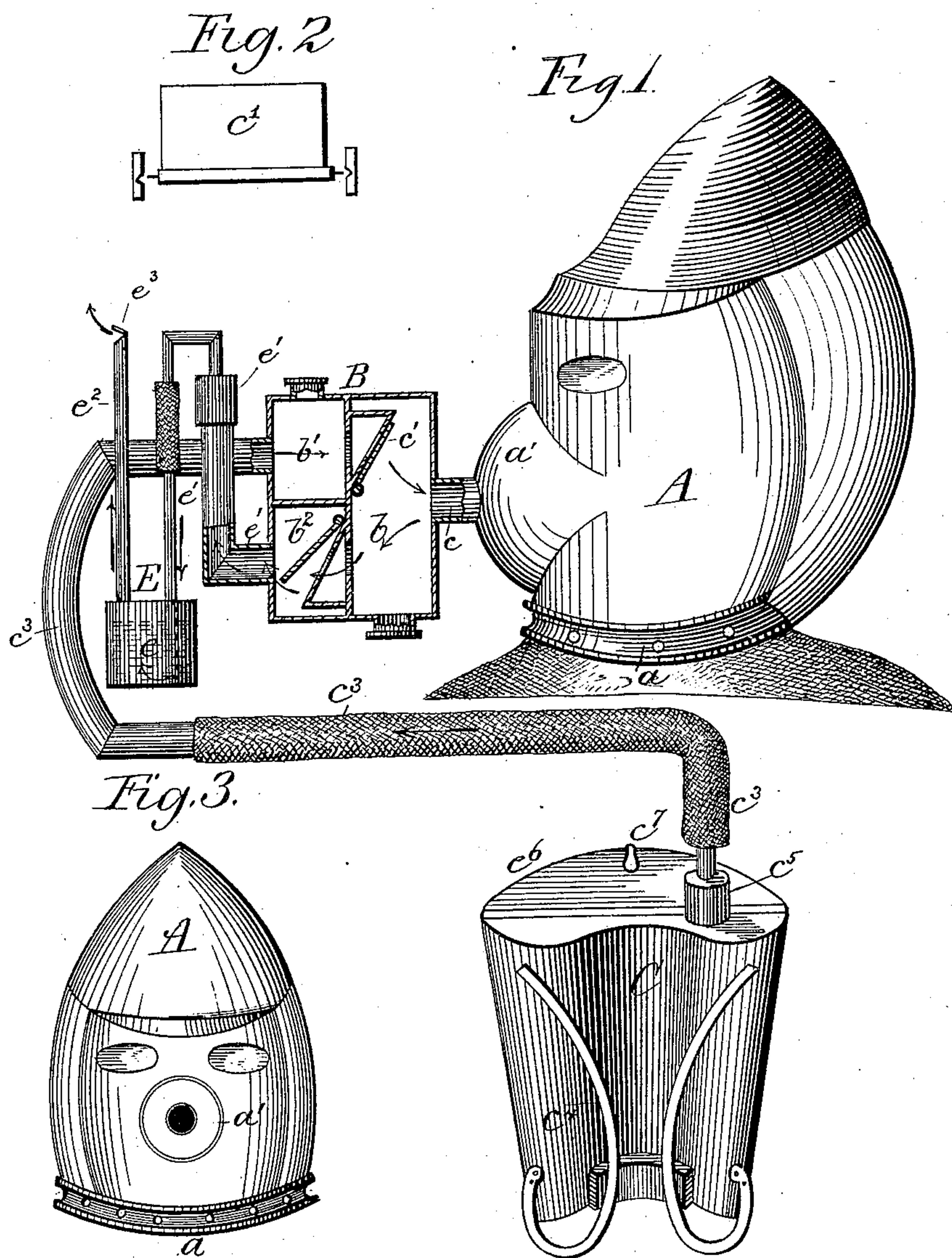
(No Model.)

2 Sheets—Sheet 1

J. RUDOLFY.  
INHALER.

No. 404,986.

Patented June 11, 1889.



Witnesses  
*Frederic. Hawk*  
*Chas. A. Foulkes.*

Inventor  
*Josef. Rudolfy.*

by

*Ferdinand B. Schardt*  
Attorney.

(No Model.)

2 Sheets—Sheet 2.

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Fig. 4.

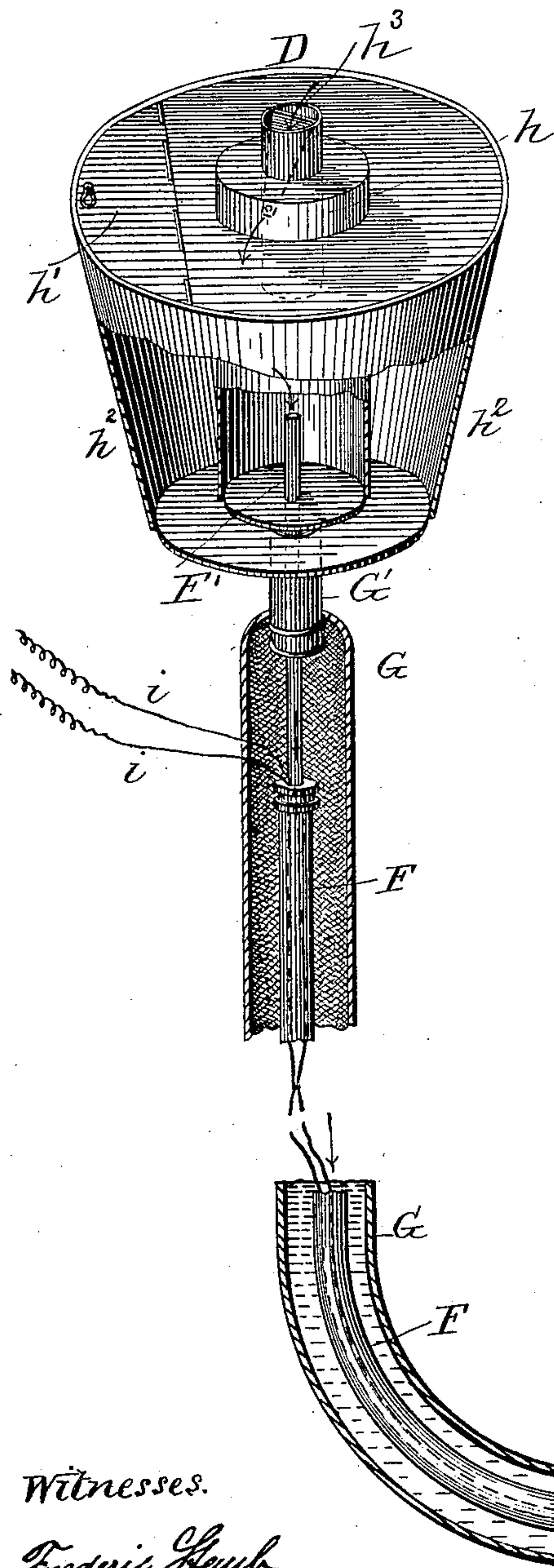
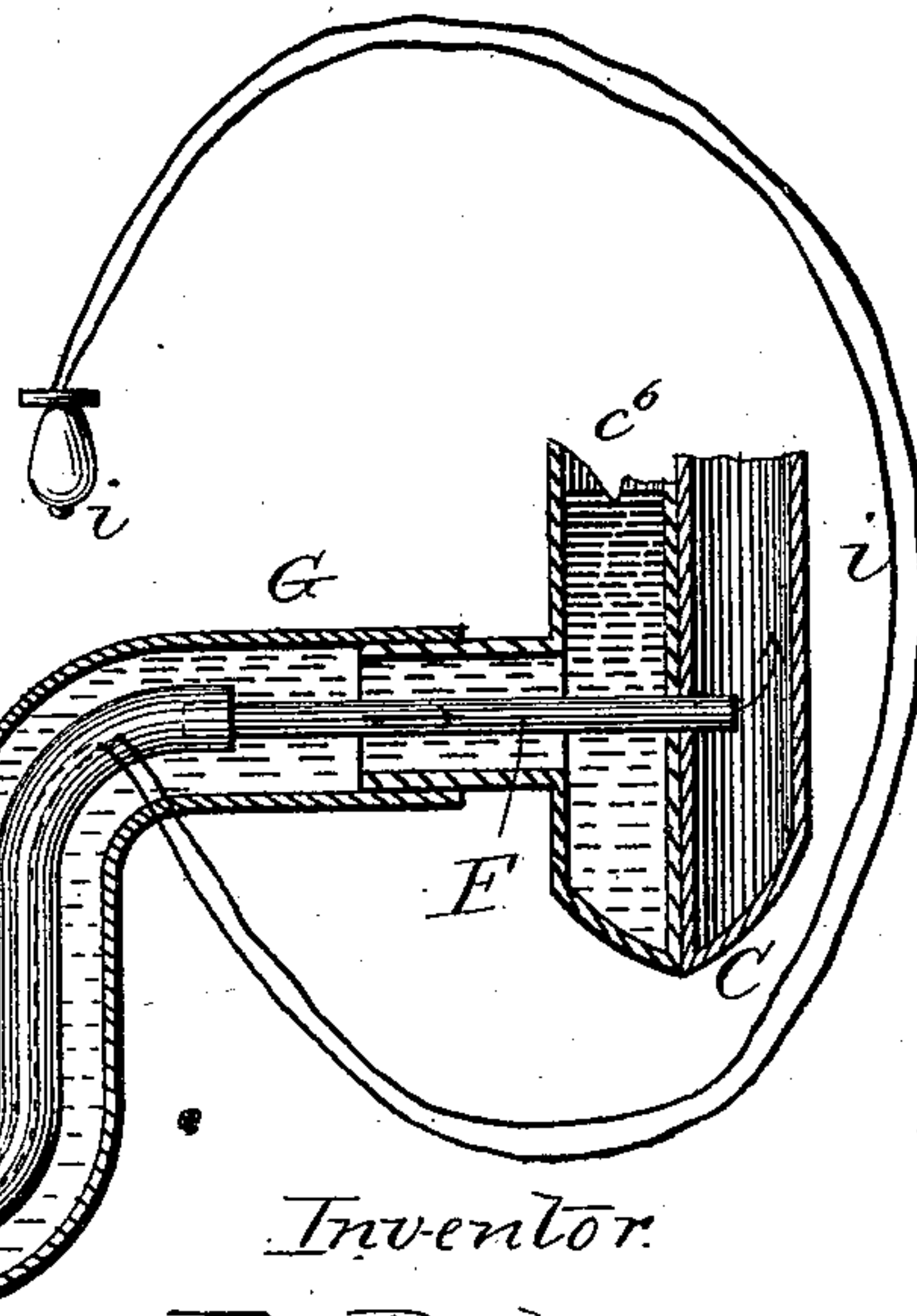
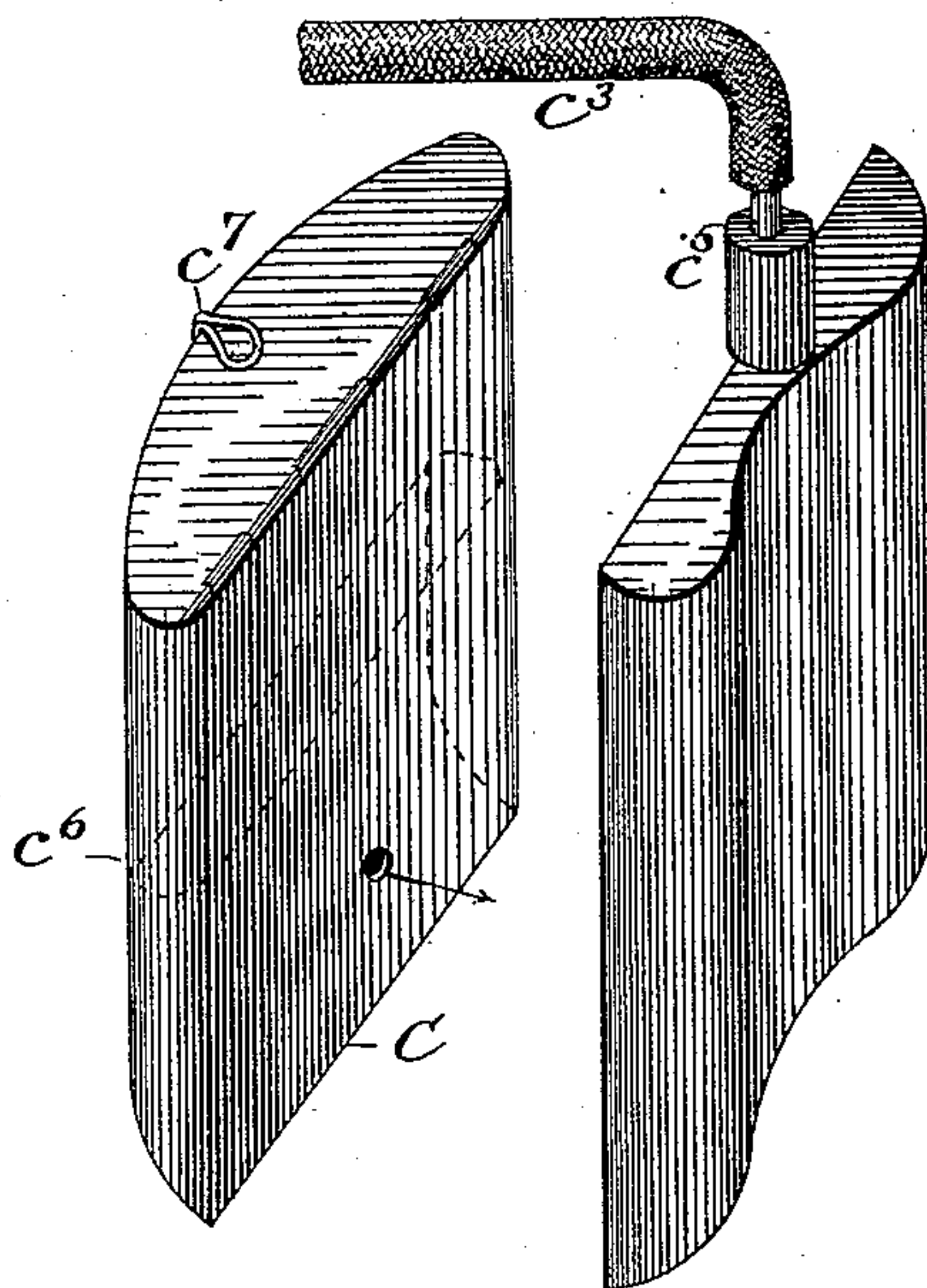


Fig. 5.



Witnesses.

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# UNITED STATES PATENT OFFICE.

JOSEF RUDOLFY, OF SZEGEDIN, AUSTRIA-HUNGARY.

## INHALER.

SPECIFICATION forming part of Letters Patent No. 404,986, dated June 11, 1889.

Application filed March 28, 1887. Serial No. 232,815. (No model.) Patented in France October 30, 1886, No. 179,356, and in Belgium December 6, 1886.

*To all whom it may concern:*

Be it known that I, JOSEF RUDOLFY, medical doctor, a subject of the King of Austria-Hungary, and residing at Szegedin, in the Kingdom of Austria-Hungary, have invented new and useful Improvements in Inhalation Apparatus, (for which I have obtained patents in France, dated October 30, 1886, No. 179,356, and in Belgium, dated December 6, 1886,) of which the following is a specification.

My invention relates to improvements in inhalation apparatus, and has for its objects, first, to enable firemen and others to breathe freely and operate in places filled with dense smoke or mephitic gases without being affected by the same; secondly, to provide such apparatus with means for communication. I attain these objects by the appliances illustrated in the accompanying two sheets of drawings, in which—

Figure 1, Sheet I, is a side view of the mask, air-reservoir, air-trap, and valve-box in section; Fig. 2, a plan of the flap-valve in the valve-box, in detail; Fig. 3, a front view of the mask. Fig. 4, Sheet II is a perspective view of the air-inlet in connection with the air-reservoir and wires leading to the alarm button and bell; and Fig. 5, a perspective view of the air-reservoir, shown in two parts.

Similar letters refer to similar parts throughout the several figures.

The mask A, on its lower portion *a*, (see Figs. 1, 2, and 4,) is fixed to the jacket I, so as to fit hermetically around the neck, and in front of the nose and mouth formed with a bulged portion *a'*, and in front of the eyes made transparent. The part *a'*, by means of a short pipe *c*, is suitably connected to the respiratory parts of the apparatus, consisting of the valve-box B, air-reservoir C, air-inlet D, and trap E, the action and effect of which are based on the physical law—viz., the difference of air-pressure which is produced through the respiration, partly between the air in the lungs and the air in the reservoir and exterior or atmospheric air.

The valve-box B (see Fig. 1, Sheet I) is formed with three compartments *b b' b''*, and provided with flap-valves *c'* and *c''*, which

are attached hinge-like (see also Fig. 2) to the interior of the valve-box B, and in such positions that the valve *c'* opens into the compartment *b*, and the valve *c''* into the compartment *b''*, and the valve *c'* will be off and the valve *c''* on its respective seat when the apparatus is not in use. The valve *c''* establishes communication between the reservoir C and mask A by means of the pipe *c''*, attached to the reservoir C and valve-box B, compartment *b'*, the valve *c'*, and compartment *b*, formed or attached to the mask A. The compartment *b* is also in communication with the air-trap E, by means of the valve *c''*, compartments *b''*, and the bent pipe *e'*, connected thereto and to the air-trap E, one portion of the pipe *e'* being flexible, so as to retain the air-trap E always in a vertical position when the apparatus is in use. This air-trap E is partially filled with water or other liquid, and consists of a vessel *e*, which is provided with the pipes *e'* and *e''*, the bent pipe *e'* passing into the vessel *e*, and being the means of connection between the latter and the valve-box compartment *b''*, and the pipe *e''* being fixed to the top of the vessel *e*, and at its upper extremity provided with a lid-valve *e''*, establishing communication between the latter and the atmosphere. The valve-box compartment *b'*, by means of a flexible tube *c''*, communicates with the air-reservoir C, which is provided with straps *c''*, and is carried on the back by the user, the connection between the air-reservoir C and the valve-box B being of such a nature as to permit the moving of the head in any direction.

The flexible tube *c''* is connected to the cylindrical portion *c''*, formed on the top of the air-reservoir C, which is filled with hot water in cases where the temperature of the air to be inhaled is below zero, and serves to keep the air at a temperature which will not be injurious to the user of the apparatus.

The air-reservoir C is formed with a water-jacket *c''*, (see Fig. 5, Sheet II, shown in the drawings separated from each other,) the top of which is formed with a lid *c''*, and near the bottom brought into connection with the pipes F and G, pipe F passing through the water-jacket *c''* into the air-chamber C, and the pipe



G communicating with the water-jacket  $c^6$ . The space between air-supply pipe F and the hose G around it is filled with water for the purpose of keeping the ingoing air cool, and the other end of the hose G and air-inlet pipe F  
5 being suitably connected to an air-inlet D, fixed outside the place filled with smoke or mephitic gas, and constructed as follows:

To the outer end of the hose G is attached  
10 a short pipe  $G'$ , which is connected to the conical vessel  $h^2$ , and at the top formed with a lid  $h'$ , serving for the introduction of water into the vessel  $h^2$ . Inside the latter, a little above the orifice of the said pipe  $G'$  and centrally  
15 therewith, a cylindrical vessel  $h$  is fixed into the top of the vessel  $h^2$ , carrying at its top a short tube or whistle  $h^3$ , and at its bottom a pipe  $F'$ , which is in connection with the air-inlet pipe F.

20 In order to establish communication between the user of the inhaler and person outside the place of operation, an electrical alarm-bell is provided, composed of an ordinary bell of which the dry pile and the bell are  
25 placed outside, while the button  $i$  is attached to the chest of the person using the apparatus, and employed near the air-inlet D, the electric current of same being conducted through the wires  $i$ , which pass through the  
30 air-inlet pipe F, and out of the latter near the air-reservoir C, and to a button  $i'$ , connected therewith, which is under the control of the user.

35 The arrows on the drawings indicate the movement of the air in the apparatus and the functions of the valves at the moment of exhalation.

Instead of the electric alarm-bell air may be used to give the desired signal through a whistle.

Having now particularly described and ascertained the nature of my invention, what I claim as my invention, and desire to secure by Letters Patent, is—

1. In an inhaler, the air-inlet pipe F, inserted in a hose G, in combination with the air-reservoir C, formed with a water-jacket  $c^6$  and with the air-inlet D, formed with an air-whistle  $h^3$ , and water-vessel  $h^2$ , all substantially as and for the purpose specified.

2. In an inhaler, the reservoir C, formed at its top with a hot-water vessel  $c^5$ , communicating with the flexible air-inlet tube  $c^3$ , substantially as shown, and for the purpose specified.

3. The combination of the valve-box B, formed with the valve-compartments  $b$ ,  $b'$ , and  $b^2$  and provided with the air inlet and outlet valves  $c'$  and  $c^2$  and trap E, with the mask A and air-reservoir C, by means of the  
60 pipes  $c$  and  $c'$ , respectively, for the purposes specified, all substantially as set forth.

4. In an inhaler, the combination, with the air-inlet pipe F, of the wires  $i$ , inserted therein and electrically connected to an alarm-  
65 bell and press-button, respectively, all substantially as and for the purpose specified.

In testimony that I claim the foregoing I have hereunto set my hand this 24th day of December, 1886.

JOSEF RUDOLFY.

Witnesses:

EMILE KANTER,  
G. ANTHONIS, Jr.