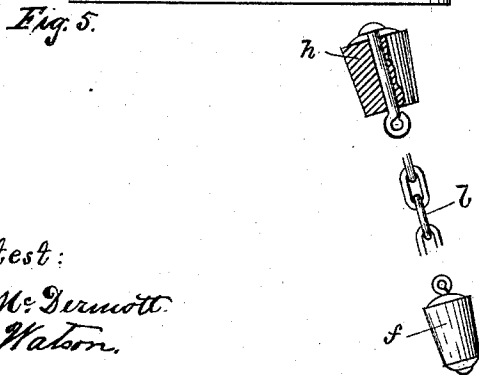
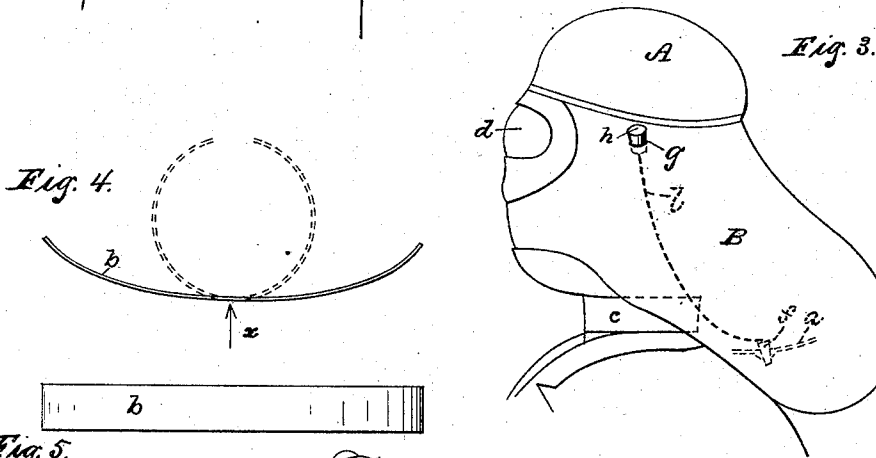
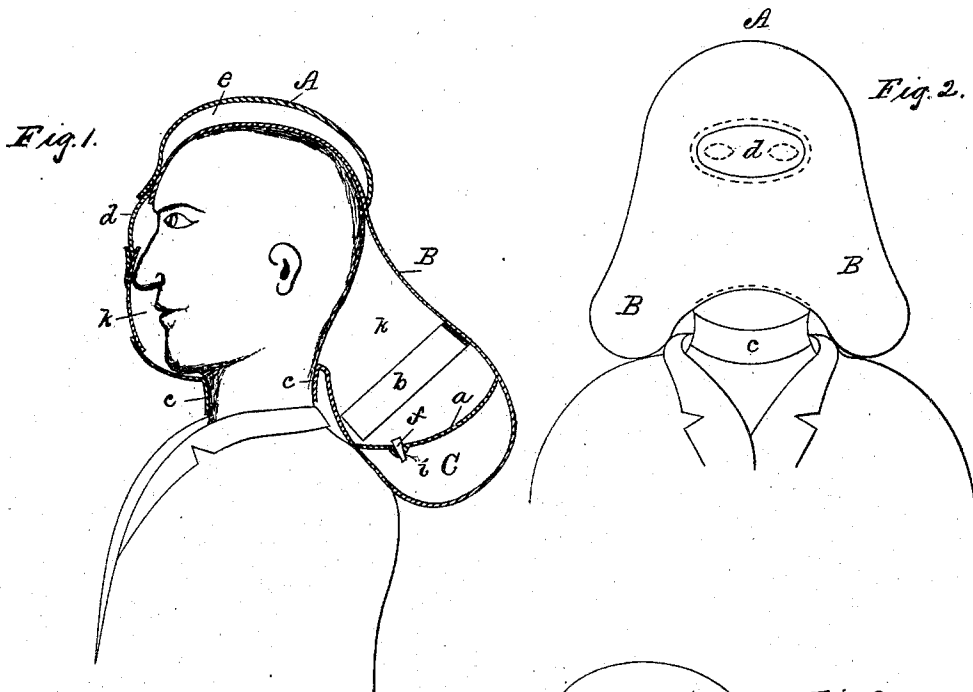


(No Model.)

H. M. COCHRAN.
RESPIRATOR.

No. 396,809.

Patented Jan. 29, 1889.



Attest:
M. M. Dermott.
J. Watson.

Fig. 6.

Inventor:
Hugh M. Cochran
By E. B. Whitmore, Atty.

UNITED STATES PATENT OFFICE.

HUGH M. COCHRAN, OF McCONNELLSVILLE, OHIO.

RESPIRATOR.

SPECIFICATION forming part of Letters Patent No. 396,809, dated January 29, 1889.

Application filed December 10, 1888. Serial No. 293,161. (No model.)

To all whom it may concern:

Be it known that I, HUGH M. COCHRAN, of McConnellsville, in the county of Morgan and State of Ohio, have invented a new and useful Improvement in Head-Protectors and Breathing-Caps, which improvement is fully set forth in the following specification and shown in the accompanying drawings.

The object of my invention is to produce an improved head-protector and inhaler, the same being hereinafter fully described, and more particularly pointed out in the claim.

Referring to the drawings, Figure 1 is a side sectional elevation of my improved head-protector and breathing-cap shown as in use; Fig. 2, a front elevation of the same; Fig. 3, a left side elevation; Fig. 4, an expander for the air-reservoir, shown in two positions by full and dotted lines; Fig. 5, a side elevation of the expander seen as indicated by arrow *x*, and Fig. 6, drawn to a larger scale, shows the stoppers for the orifices of the interior chambers.

The device is intended to be made of india-rubber and cloth, so as to be impervious to air and be light, strong, flexible, and substantially non-elastic.

Referring to the parts shown in the drawings, A is the cap proper of the device, fitting closely to the upper part of the head; B, the fresh-air reservoir, and C a chamber for holding oxygen, the latter chamber being separated from the air-reservoir by a flexible diaphragm, *a*.

b is an expander for the air-reservoir, it being formed of any elastic material—such as spring-steel or similar material—and placed within the reservoir, substantially as shown.

The device is provided with an elastic neck-band, *c*, of soft rubber, which is expanded when the device is put on and closes snugly around the neck to prevent the ingress of smoke, &c.

In front the device is provided with a glass, *d*, for the eyes, to enable the wearer to see his surroundings. On top of the head is formed a tight air-chamber, *e*, which forms a protection for the head against the heat and falling bodies.

The diaphragm *a* is formed with a small opening, *i*, stopped by some simple means—as, for instance, a tapered plug, *f*, of india-

rubber or similar material—and the air-reservoir is provided with a similar though larger opening at *g*, stopped with a similar tapered plug, *h*. The opening *i* allows oxygen to escape from the chamber C into the air-space *k* of the air-reservoir B, while the opening at *g* communicates between the air-space *k* and the external atmosphere. The stoppers *f* and *h* are joined by a chain, *l*, so that the lower one may be withdrawn from the opening *i* by the wearer seizing the upper one which projects from the side of the device in easy reach and pulling it upward out of the opening *g*. After the small stopper is withdrawn the upper one may be replaced, if necessary, or it may also be left out of its opening and allowed to hang loosely at the side. The connecting-chain for the stoppers is of sufficient length to allow the upper stopper to be withdrawn, while the lower one is left in place, should it be desirable to use the device in that manner.

The expander is inserted through the neck-opening before the device is put upon the head.

The oxygen-chamber may be supplied with oxygen by any convenient and well-known means. In the act of respiration the wearer inhales the air from the space *k* and allows the oxygen to enter said space whenever necessary in the manner above described.

This head-covering is designed to be used during periods of a few minutes' duration, when it is removed from the head. Its capacity may be greater or less, according to circumstances, and the device is designed to be made in different sizes, so as to be used by different persons.

In case of establishments where many employes are congregated in upper stories of the building these protectors may be supplied in quantity and kept in convenient reach for use in case of need, enabling the operatives to escape from the building through passages filled with smoke and gas.

Instead of the upper part of the cap, as shown, a metal cap of the kind commonly worn by firemen may be used, if desired, the other parts of the device remaining the same. The air-chamber B may be joined at its upper edge to the metal cap by cement, rivets, or other common means, so as to make an airtight joint between the parts.

What I claim as my invention is—

A head-protector and breathing-cap consisting of an air-space, *h*, in combination with an oxygen-chamber, an opening, *i*, communicating between said oxygen-chamber and air-space, an opening, *g*, communicating between said air-space and the external air, a stopper

for said opening *i*, a stopper for said opening *g*, and a chain or cord connecting said stoppers, substantially as described.

HUGH M. COCHRAN.

Witnesses:

E. B. WHITMORE,
M. L. McDERMOTT.