# T. A. Hoffmann,

## Respirator.

No. 58,255. Patented Sep. 25 1866.

Fig 1.

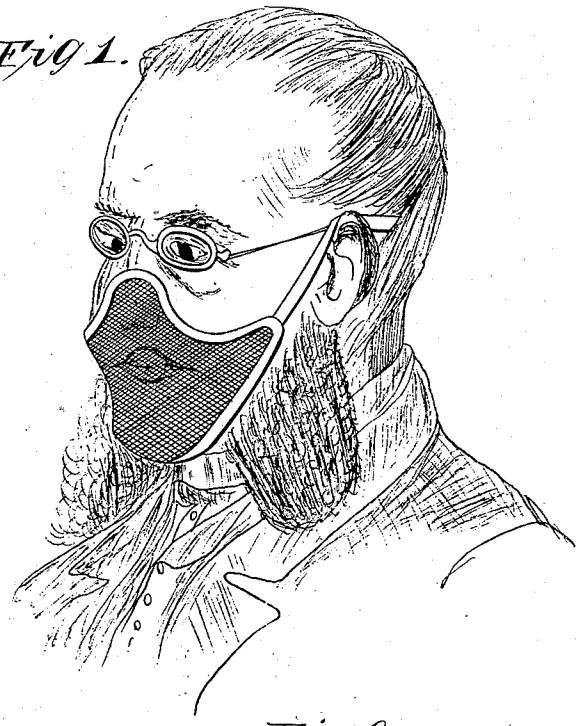
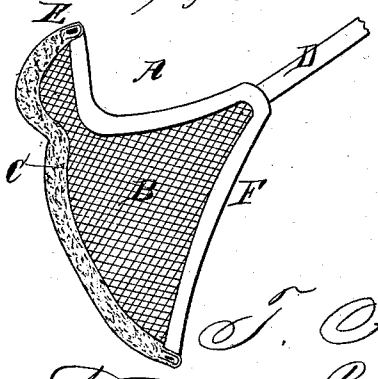


Fig 2.




Witnesses.

J. W. B. Compton

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# UNITED STATES PATENT OFFICE.

THEODORE A. HOFFMANN, OF BEARDSTOWN, ILLINOIS.

## IMPROVEMENT IN RESPIRATORS.

Specification forming part of Letters Patent No. **58,255**, dated September 25, 1866.

*To all whom it may concern:*

Be it known that I, THEODORE A. HOFFMANN, of Beardstown, Cass county, State of Illinois, have invented a new and useful Improvement in Respirators; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 represents a respirator made according to my invention, showing also how it is applied and worn. Fig. 2 is a cross-section thereof.

Similar letters of reference indicate like parts.

The object of this invention is to provide a convenient and economical apparatus or article for filtering the air which is inhaled in breathing. The apparatus is worn on the nose and mouth, and, without checking the access of air to the lungs in an inconvenient degree, arrests dust and foreign matters floating in the air, and protects the respiratory organs from the influence of malarious and contagious elements which may be found in the atmosphere. The apparatus will be of great advantage to those who are affected by diseases of the lungs or throat.

If a person stands in a dark place or room, and the rays of the sun enter into the same through a small opening, he will observe in the beams of the light falling through the opening a vast amount of small particles in different shapes and forms moving in the air, although these fine particles are carriers of miasma and malaria, when such are in existence in the surrounding air. This air is brought into contact with the lungs by process of respiration. When the atmosphere is pure and a person is in a healthy state, the inhalation of those particles may not develop much effect on the respiratory organs. Still, when the respiratory organs are in a diseased state the inhalation of these particles is of a very important character on the diseased parts.

The apparatus which is here shown, and which illustrates my invention, is made of two layers of gauze, made of cotton or other textile fabric, of a convenient shape to envelop the mouth and nostrils, inclosing between them a lining of loose cotton or cotton wadding or batting, or other loose textile material of the thickness of one-fourth of an inch, more or less. The edges of the gauze are bound with shirred elastic braid, or its equivalent, to make an elastic border; or they may be bound with ribbon or tape, which shall inclose also an elastic cord or strand, so that the apparatus may be stretched over the mouth and nostrils, and by the contraction of the elastic border be made to embrace them close enough to prevent the entrance of air between the edges and border of the apparatus and face.

By this means I am able to provide a person that lives in an unhealthy atmosphere, or one who is compelled for a time to work in or pass through air filled with dust and foreign matter, with a means of filtering the air and purifying it before it is admitted to the lungs.

The application of this invention will suggest itself in the various circumstances and occupations where it will be valuable. It will be valuable to persons living in infected districts, to laborers and artisans who are compelled by their calling to work in places more or less filled with dust—such, for instance, as ax-grinders, workers in fur and wool, in factories, and also to those engaged in the work of sweeping, also to those who are suddenly exposed to cold air.

The purifying action of cotton as a filter is thought to be very great.

It is an established fact, and proved by the experiments of Prof. H. Schroeder, Dr. Th. V. Dusch, in 1854, also Th. Solmann, Ure, Helmholtz, and others, that when atmospheric air is filtered through cotton the effect on substances about to undergo fermentation, decay, or putrefaction, is different from that when air has free action on the same. For instance, if a decoction of lean meat be divided and poured in two vessels, the one left to the free access of air, the other vessel closed and communication with the air allowed only through a glass tube filled partly with loose fibers, as of cotton, the decoction in the open vessel will show signs of putrefaction within a few days, while that with a cotton filter will keep in good state several weeks. Similar results are obtained by the exposure of saccharine liquids or infu-

sions of malt. Fermentation is checked by the cotton. Rigaud de L'Isle, on the other side, in his treatise on the Pontine marshes, explained the influence of a forest as purifying the malarious air.

I make use in my invention of this valuable property of cotton and other fibrous materials in a loose, open, and porous state.

The letter A designates the apparatus. The gauze is shown at B. Being made of textile material it readily conforms to the features. C is the inclosed loose cotton. F is a covering which binds the edges of the apparatus, inclosing within it an elastic strand, E. The apparatus is held to the face by an elastic band, D, which goes around the back of the head.

The respirator can be cleaned by pouring soap-suds of a temperature of 160° (Fahrenheit) of heat (more or less) over the same, dipping it into the suds, and rinsing it with clean water; or the inclosed lining may be removed and fresh material substituted.

In making the apparatus regard may be had to different colors, so as to produce a pleasing effect on the eye with the materials used.

I disclaim the application of metallic gauze for respirators, and also the use of charcoal or platinized coal.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

The gauze B, inclosed cotton C, covering F, and elastic strand E, combined and provided with the elastic strap D, and operating substantially as described, for the purpose specified.

THEODORE A. HOFFMANN.

Witnesses:
L. F. SANDERS,
JAS. MCCLURE.