2 Sheets--Sheet 1.

C. D. HUNTER & E. S. WOODS.

Inhalers.

No. 138,253. Patented April 29, 1873.

Fig. 1.

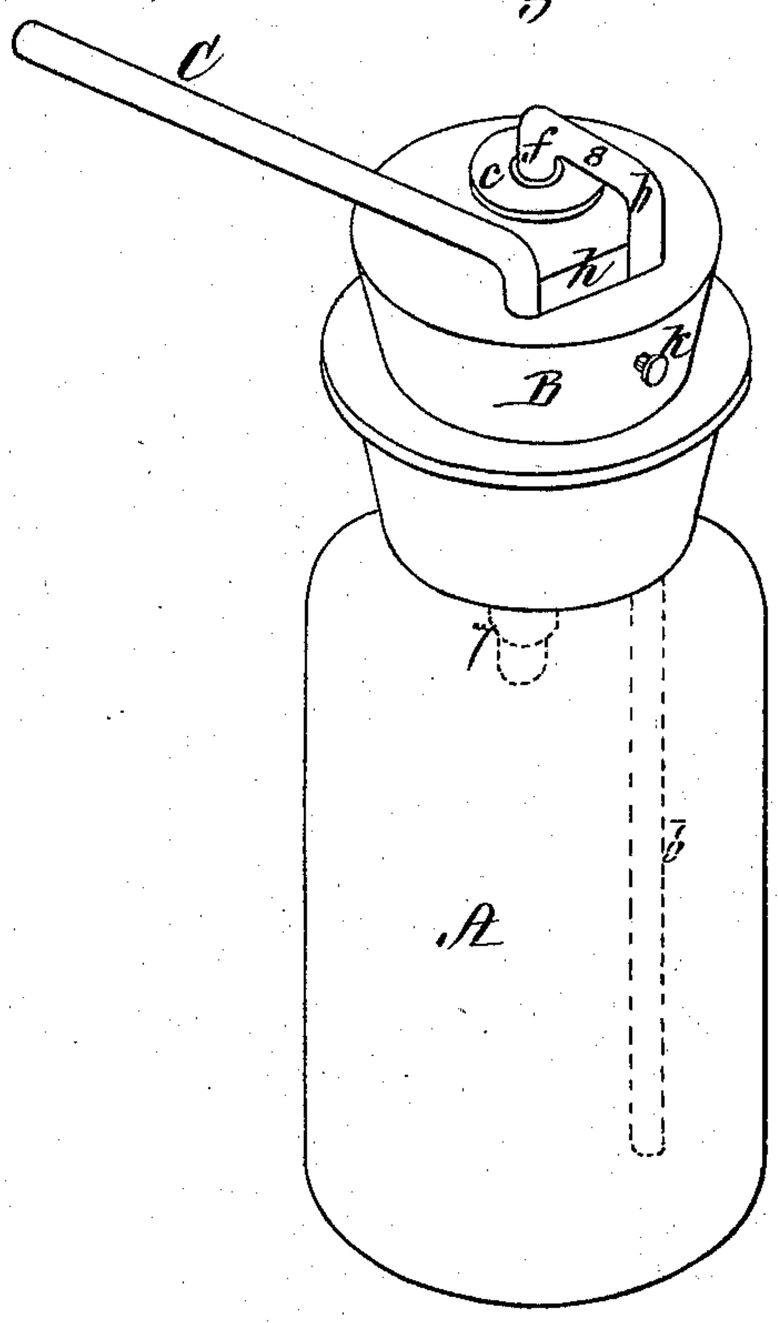
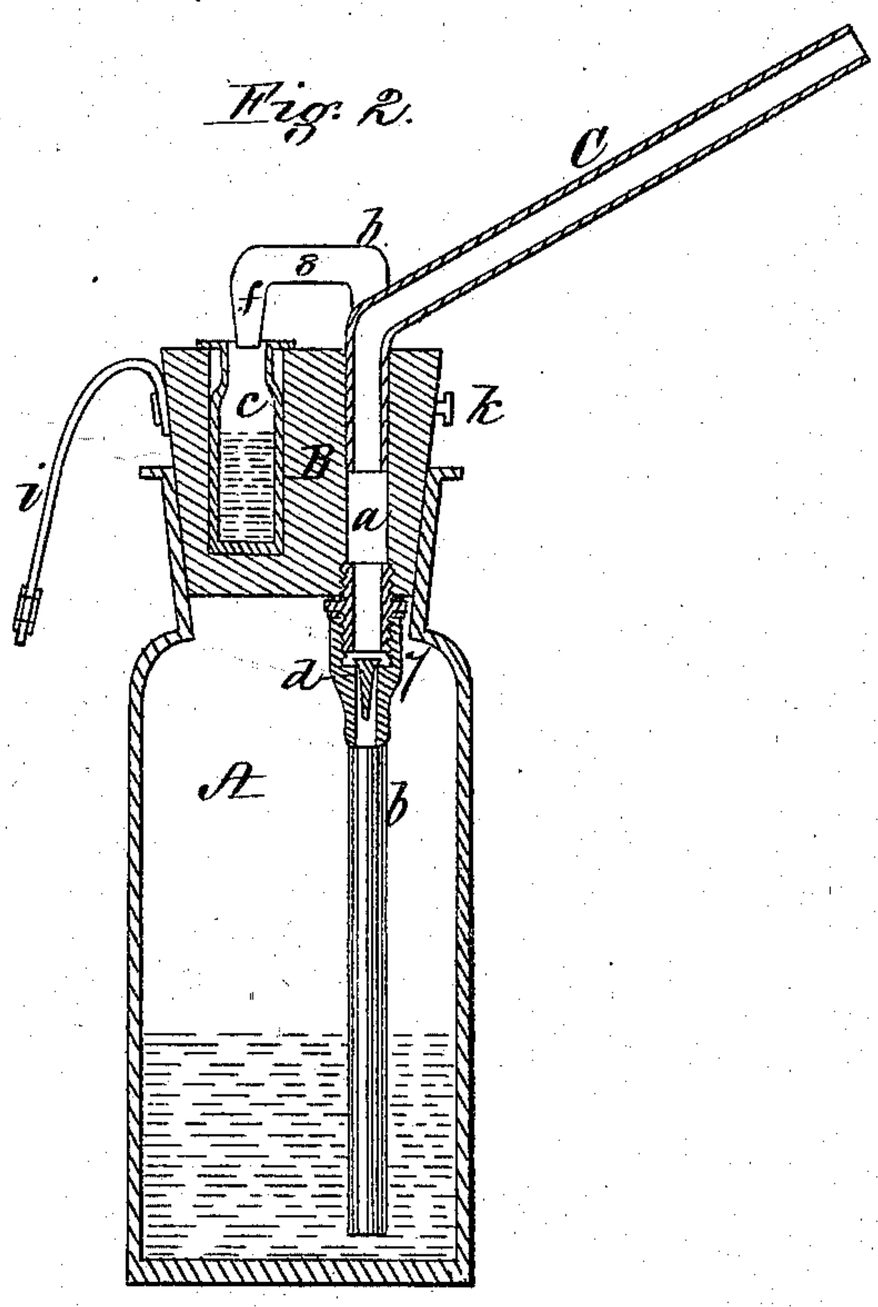


Fig. 2.



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2 Sheets--Sheet 2.

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Fig: 3.

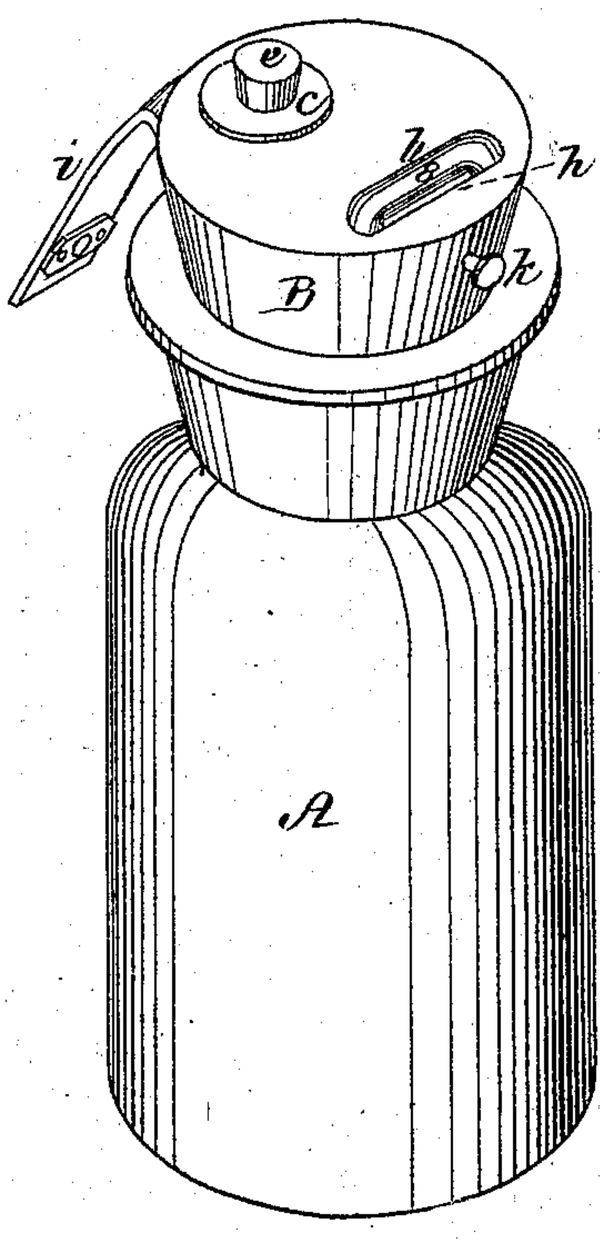


Fig: 4.

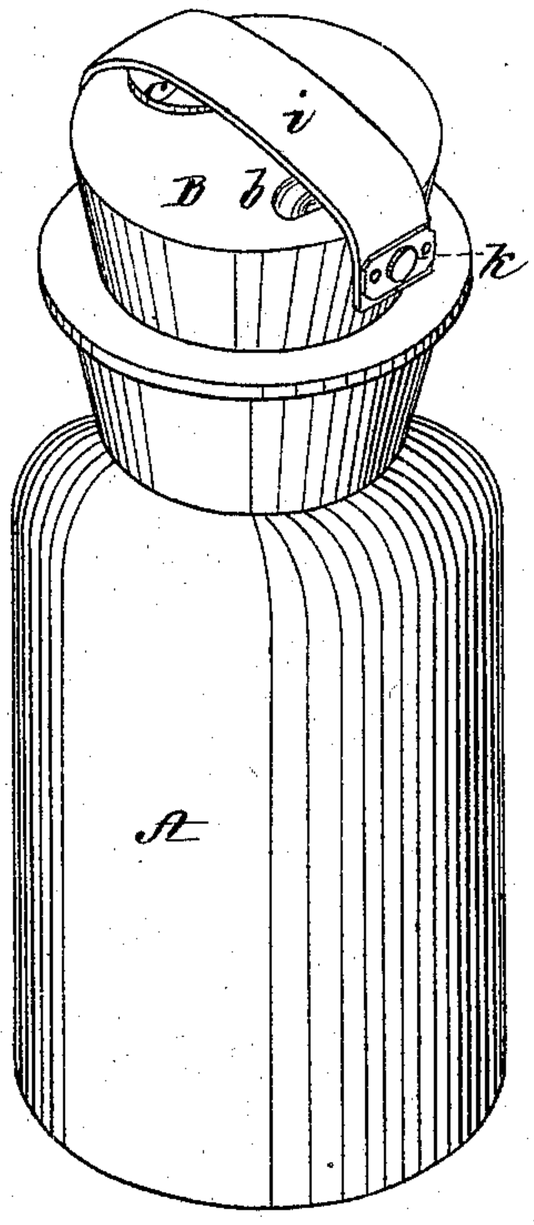


Fig: 5.

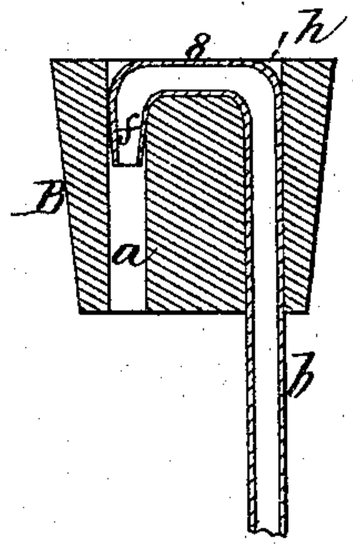
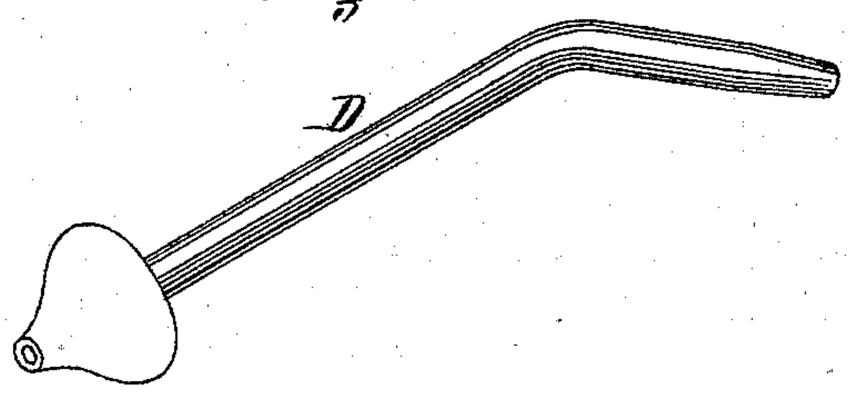


Fig: 6.



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UNITED STATES PATENT OFFICE.

CLIFTON D. HUNTER AND ERASTUS S. WOODS, OF MARLBOROUGH, MASS.

IMPROVEMENT IN INHALERS.

Specification forming part of Letters Patent No. **138,253**, dated April 29, 1873; application filed March 29, 1873.

To all whom it may concern:

Be it known that we, CLIFTON D. HUNTER and ERASTUS S. WOODS, of Marlborough, in the county of Middlesex and State of Massachusetts, have invented certain Improvements in Inhalers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing making part of this specification, in which—

Figure 1 is a perspective view of our improved inhaler ready for use. Fig. 2 is a vertical section through the same. Fig. 3 is a perspective view of our inhaler ready to be packed for traveling, the protecting-band being thrown to one side; Fig. 4, a view showing the protecting-band in place; Fig. 5, sectional detail; Fig. 6, view of a nasal tube.

Vapor-inhalers as heretofore constructed are objectionable, for the reason that the act of blowing or breathing down the exhaust or inhaling tube will cause the liquid in the main receptacle to rise in the inlet-tube and flow into the acid-vessel, thus destroying the power of the acid and necessitating the emptying and resupplying of the main receptacle and the acid-vessel.

The first part of our invention has for its object to overcome this difficulty; and consists in the application of a valve to the exhaust tube or passage or to the inlet-tube, which valve will instantly close should any person inadvertently breathe or blow into the exhaust-tube, thus preventing the liquid in the main receptacle from rising in the inlet-tube and mixing with the contents of the acid-vessel, the valve also preventing the evaporation of the volatile portion of the liquid in the main receptacle. The acid-vessel has heretofore been connected with the inlet-tube, and placed either inside or outside of the main receptacle, and was, consequently, extremely liable to be injured or broken.

The second part of our invention consists in placing the acid-vessel within a cavity or recess within the stopper of the main receptacle, whereby the liability of breaking the acid-vessel is avoided.

The third part of our invention consists in providing the stopper of the main receptacle with a groove or recess for the reception of the upper portion of the inlet-tube when forced down, whereby it is protected from injury, the inlet-tube being so constructed and arranged that when disconnected from the acid-vessel and swung around its end, when forced down, will enter and close the exhaust-passage in the stopper after the removal of the exhaust-tube therefrom, by which means the escape of the liquid from the main receptacle is prevented, should the apparatus be inverted in traveling.

The fourth part of our invention consists in a band so fitted to the stopper of the main receptacle that it may be stretched over the stopper of the acid-vessel to hold it in place, and over the top of the inlet-tube to protect it and the vessel from injury when the inhaler is packed for traveling.

To enable others skilled in the art to understand and use our invention, we will proceed to describe the manner in which we have carried it out.

In the said drawing, A is the main receptacle for containing the medicated liquid. B is a stopper of rubber or other suitable material, provided with a passage, *a*, for the reception of the exhaust or inhaling tube C, through which the vapor is inhaled. *b* is the inlet-tube, which passes through the stopper and extends nearly down to the bottom of the main receptacle, the upper end of this tube being bent, as seen in Fig. 2, to receive the fumes of the muriatic acid in the vessel *c*, placed in a cavity in the stopper B, the depth of the cavity being such that only the upper edge of the vessel will project above the upper surface of the stopper, and thus, as the air is exhausted from the receptacle A by the act of inhaling, the fumes of the acid are drawn down the inlet-tube *b*, and, passing through the medicated liquid containing a small quantity of concentrated aqua ammonia, combines therewith and forms the vapor to be inhaled. To the lower end of the exhaust-passage *a* is fitted a metallic casing, 7, containing a valve, *d*, which opens upward to allow of the passage of the vapor to be inhaled, but will instantly close and shut off communication should any one either blow or breathe into the exhaust-tube, thus preventing any pressure of air upon the surface of the medicated liquid, and its consequent rise up the inlet-tube into the acid-vessel *c*, which mixture of the acid and medi-

cated liquid destroys their power of generating vapor, and necessitates the emptying of the apparatus and a new supply of the medicated liquid and acid, which frequently requires to be done in inhalers as heretofore constructed, and which is a great objection to their use. The valve *b* also prevents the evaporation of the volatile portion of the medicated liquid, which would occur if no valve were employed.

By embedding the acid-receptacle within the stopper, as above described, it is effectually prevented from breakage, which is not the case where it is placed inside or outside the main receptacle, away from the stopper.

When it is desired to pack the inhaler in a trunk or valise for traveling, it is not necessary to empty out the medicated liquid and the acid, but merely to raise the inlet-tube *b* and disconnect it from the acid-vessel, which must then be tightly closed by a stopper, *e*, Fig. 3. The inlet-tube is now turned around until its end *f* is over the exhaust-passage *a*, (from which the exhaust-tube has been previously removed,) when it is forced down, as seen in Fig. 5, the portion 8 resting in a groove, *h*, formed in the stopper B, and the end *f* fitting into and tightly closing the exhaust-passage *a*. The escape of any of the medicated liquid from the main receptacle A through the inlet-tube *b* or exhaust-passage *a* is thus effectually prevented, and the inhaler charged ready for use, can consequently be packed in a trunk or valise without liability of leakage.

It will be seen that the groove *h* allows the portion 8 of the inlet-tube to be forced down flush, or nearly so, with the upper surface of the stopper B, whereby it is protected from injury.

When the parts are in the position seen in Fig. 3, a band, *i*, of rubber or other suitable material, (one end of which is permanently attached to one side of the stopper B,) is stretched over the stopper *e* of the acid-vessel and the inlet-tube and secured to the opposite side of the stopper B by a hook or catch, *k*, as seen in Fig. 4, the band serving to hold the stopper of the acid-vessel in place and protect it and the inlet-tube when packed for traveling. The long tube C, Fig. 1, may be replaced by a nasal tube, D, Fig. 6, when it is desired to inhale the vapor through the nose.

Claims.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. The valve *d*, in combination with the exhaust-tube C, inlet-tube *b*, stopper B, and main receptacle A, operating substantially in the manner and for the purpose described.

2. The stopper B provided with a cavity or recess for the reception of the acid-vessel *c*, substantially as and for the purpose set forth.

3. The stopper B provided with a groove, *h*, for the reception of the upper portion 8 of the inlet-tube *b* when forced down, the inlet-tube being so constructed and arranged that it may close the exhaust-passage and prevent the leakage or escape of the medicated liquid from the main receptacle when tipped or inverted, substantially as described.

4. The band *i*, in combination with the acid-vessel embedded in the stopper B, and the inlet-tube *b*, substantially as and for the purpose set forth.

Witness our hands this 26th day of March, 1873.

CLIFTON D. HUNTER.
ERASTUS S. WOODS.

In presence of—
WILLIE A. ONTHANK,
EDWARD F. JOHNSON.