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INHALER FOR ANALGESIC OR ANAESTHETIC PURPOSES

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Fig. 1.

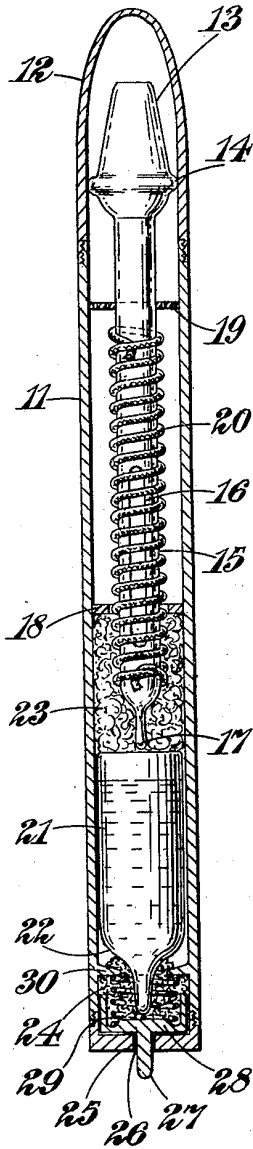


Fig. 2.

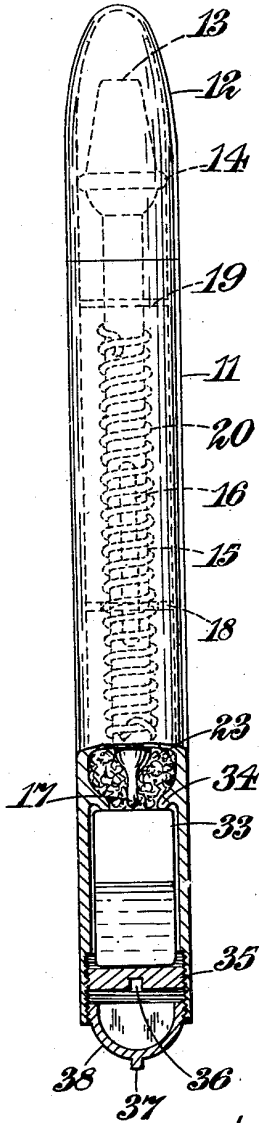
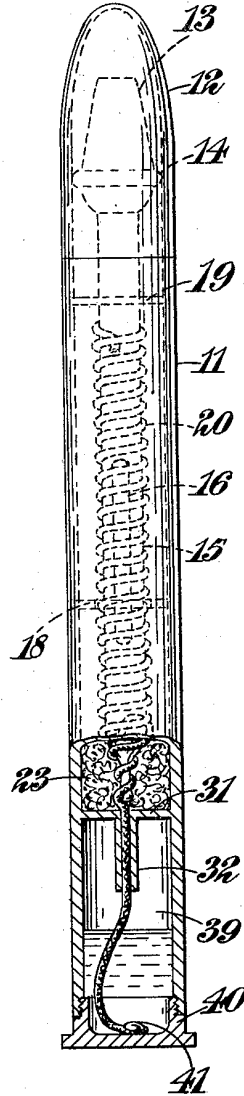


Fig. 3.



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INHALER FOR ANALGESIC OR ANAESTHETIC PURPOSES

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4 Claims. (Cl. 128—200)

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This invention is for improvements in or relating to inhalers for analgesic or anaesthetic purposes, and has particular reference to inhalers which are small and compact enough to be carried in the pocket and are robust in construction.

Various forms of portable inhalers are already known but these suffer from the disadvantage that the relatively small charge of the volatile inhalant supported on fibrous absorbent material has to be replenished comparatively frequently.

It is an object of the present invention to provide an inhaler for analgesic or anaesthetic purposes which in addition to the properties of lightness, compactness and robustness also possesses the property of having a relatively large capacity so that repeated re-charging at short intervals is unnecessary. Further it is an object of the invention to provide an inhaler which is simple to charge and use, can be stored in charged condition indefinitely and is rendered ready for use instantly.

According to the present invention, there is provided a pocket inhaler for analgesic or anaesthetic purposes which comprises a perforated nose-piece, a chamber containing fibrous absorbent material for the volatile liquid analgesic or anaesthetic substance, one or more air inlets for directing air through the absorbent material and thence to the nose-piece, a container connected with the said chamber adapted to hold a supply of the volatile liquid and means for feeding the liquid to the absorbent material. The charge of volatile liquid may be carried in a frangible ampoule or like sealed container and the apparatus may be provided with means for breaking the ampoule to liberate the liquid.

As in the case of known inhalers air is drawn by the patient through the absorbent material moistened with the liquid and thence through the perforated nosepiece into the lungs.

The apparatus may be used for the administration of a wide variety of volatile analgesic or anaesthetic materials. The apparatus may conveniently be of cylindrical form, the nose-piece, chamber for absorbent and the liquid container or the container for the ampoule may be screw-coupled in series.

The liquid container may be of the unspillable variety so that flooding of the absorbent chamber is prevented and the means for feeding the liquid

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to the chamber for the absorbent may conveniently consist of a wick, one end of which is embedded in fibrous absorbent (comprising, e. g., cotton wool, which may be in the form of dental rolls) and the other end of which dips into the liquid. The absorbent may consist of other fibrous material or of a coil of the wick itself. Alternative means for feeding the liquid may embody a device for passing a predetermined volume of liquid to the absorbent as required.

The end of the liquid container or a cap covering the nose-piece may constitute a measure for the liquid so that over-filling of the container is prevented.

The apparatus is intended to be held in the hand and volatilisation of the liquid is thereby increased. Alternatively, the apparatus may embody a simple form of electric heater.

Means may be provided, e. g., a fingerhole or an adjustable valve for controlling the flow of air through the apparatus and the air inlet, or inlets, may be so arranged that a screw cap over the nose-piece constitutes an air-tight seal.

It will be understood that the absorbent chamber and liquid container may be arranged concentrically.

The whole apparatus may be sufficiently small to be carried in the pocket, e. g., like a pen or like a pencil torch, though it will be understood that parts may vary in relative size, shape and arrangement.

The apparatus may conveniently be made of metal or of synthetic resin or of both and the liquid container may be transparent.

The nose-piece and the rest of the apparatus may if desired be connected by a length of rubber tubing which enables the chambers for the fibrous material and liquid to be fixed, e. g., to the patient's head, by means of one or more adjustable elastic straps. Alternatively, the complete apparatus may be held as above-described and the nose-piece may be connected by rubber tubing to a cap for the patient's nose.

When the liquid charge is contained in an ampoule this is preferably made of glass or of plastic and the means to liberate the liquid may be such as to break, crush, pierce or otherwise open the ampoule.

The ampoule may conveniently be cylindrical in shape and may fit snugly within the casing of

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the apparatus. It may be held resiliently in place within the casing by means of fibrous material.

Means for breaking the ampoule may consist of a piston moving within the casing and provided with a striking pin or rod passing through the end cap of the apparatus and pressed away from the ampoule by means of a spring of such stiffness that accidental dropping of the apparatus even on the rod fails to drive the piston against the ampoule.

When the apparatus is required for use the end is driven against a hard surface so as to force the pin and its piston against the end of the ampoule to break it between the piston and the inner end of the nose-piece unit.

Sufficient absorbent fibrous material is provided in the container to soak up the whole of the contents of the ampoule.

Volatilisation of the analgesic or anaesthetic liquid into the air stream is effected by passing air, e. g. from the nose-piece end of the apparatus over a wick wound around the tube attached to the nose-piece and thence through one or more holes or slots into the tube to the nose-piece.

It will be understood that any one of a number of alternative means may be provided for breaking, piercing or opening the ampoule. Thus, the ampoule may be broken by means of a screw plunger or by means of a lever operated from outside the casing, suitable means being provided to guard against accidental breakage of the ampoule.

Following is a description by way of example and with reference to the accompanying diagrammatic drawing of three forms of inhaler made in accordance with the present invention.

In the drawing,

Figure 1 shows partly in central section an inhaler provided with a supply of volatile analgesic or anaesthetic liquid in a sealed ampoule.

Figure 2 shows an alternative form of inhaler, also in section in which the liquid is contained in a sealed frangible container broken by means of a screw-threaded plunger; and

Figure 3 shows in section another form of apparatus in which the liquid is contained in a non-spillable chamber within the casing.

Similar reference numerals denote similar parts throughout the figures of the drawing.

Referring to the three figures, 11 is a casing which is preferably metal and has a screw-threaded vapour-tight nose-cap 12 at one end. A nose-piece 13 provided with nostril-guard 14 projects from the casing 11 and terminates within the casing in a tubular extension 15 which is slotted or otherwise perforated at 16 and at its inner end preferably terminates in a solid head 17. The tubular extension 15 is held in position axially in the casing 11 by means of locating plates 18 and 19, the latter being provided with one or more holes for the admission of air to the annular space between the casing 11 and the tubular extension 15. The tubular extension 15 is wound with a wick of fibrous liquid absorbent material 20. Referring to Figure 1, the volatile liquid 21 is held in a sealed frangible ampoule 22 and is held in position in the casing between plugs of fibrous material 23 and 24. That end of the casing remote from the nose-piece is closed by means of a screw cap 25 provided with a central hole 26 through which a pin 27 of a piston 28 passes. This piston is held away from the ampoule 22 by means of a spring 29 which bears against the abutment 30 and is of such stiffness that even if

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the apparatus falls to the ground on the pin 27 the ampoule is not broken.

The inhaler is operated by holding it in the hand and driving the pin 27 against a hard surface to break the ampoule 22 and liberate the liquid 21 which saturates the fibrous material 23 and 24 and the wick 20. The cap 12 is now withdrawn and the nose-piece 13 inserted in the nostril. Air is aspirated through the perforated plate 19 over the wick 20 through the slot 16 and thence to the nose-piece. Vaporisation of the volatile liquid is assisted by the warmth of the hand.

Referring to Figure 2, a frangible ampoule 33 is held loosely in position by inwardly-extending projections 34 and by a screwthreaded plunger 35. The end face of the plunger 35 remote from the ampoule is grooved, as at 36, for rotation of the plunger, e. g. by means of a coin or by means of a flange 37 attached to the end of the screw cap 38 for the purpose of breaking the ampoule and liberating the liquid.

Referring to Figure 3, the casing 11 is divided as in Figure 2 by a transverse wall 31 provided with an axially-projecting tube 32 and wick 20. The chamber 39 is charged with volatile liquid through the screwed-on cap 40; the amount of liquid being such that liquid does not flow directly through the tube 32. In this case, the apparatus is instantly ready for use as long as any liquid remains in it and requires only the removal of the nose-cap and insertion in the nostril.

I claim:

1. A pocket inhaler for analgesic or anaesthetic purposes which comprises a substantially cylindrical casing, a nose-piece projecting from one end of said casing and terminating within the casing in a perforated tubular extension, fibrous absorbent material for a volatile liquid analgesic or anaesthetic substance associated with the said tubular extension, an ampoule containing a charge of the said liquid within the casing adjacent to the fibrous material and means for breaking the ampoule to liberate the liquid.

2. An inhaler as claimed in claim 1 wherein the means for breaking the ampoule comprises a piston spring-loaded to urge it away from the ampoule and a striking pin secured to said piston and passing through and projecting beyond the end of the cylindrical casing remote from the nose cap.

3. A pocket inhaler for analgesic or anaesthetic purposes which comprises a substantially cylindrical casing, a nose-piece projecting from one end of said casing passing through a perforated end plate of said casing and terminating within the casing in a perforated tubular extension, wick-like fibrous absorbent material for a volatile liquid analgesic or anaesthetic substance wound around the said tubular extension and over the perforations thereof, a frangible ampoule containing a charge of the said liquid within the casing adjacent to the fibrous material and means for breaking the ampoule to liberate the liquid.

4. A pocket inhaler for analgesic or anaesthetic purposes which comprises a substantially cylindrical casing, a nose-piece projecting from one end of said casing passing through a perforated end plate of said casing and terminating within the casing in a slotted tubular extension, a wick of fibrous liquid-absorbing material wound around at least the slotted portion of said tubular extension and terminating adjacent a fran-

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gible sealed glass ampoule containing a charge of analgesic or anaesthetic volatile liquid and means for breaking the said ampoule and liberating the liquid.

JOHN TERRY HAYWARD-BUTT. 5

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