

[54] **LOCK CHAMBER FOR PROTECTIVE ENCLOSURES**
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[30] **Foreign Application Priority Data**
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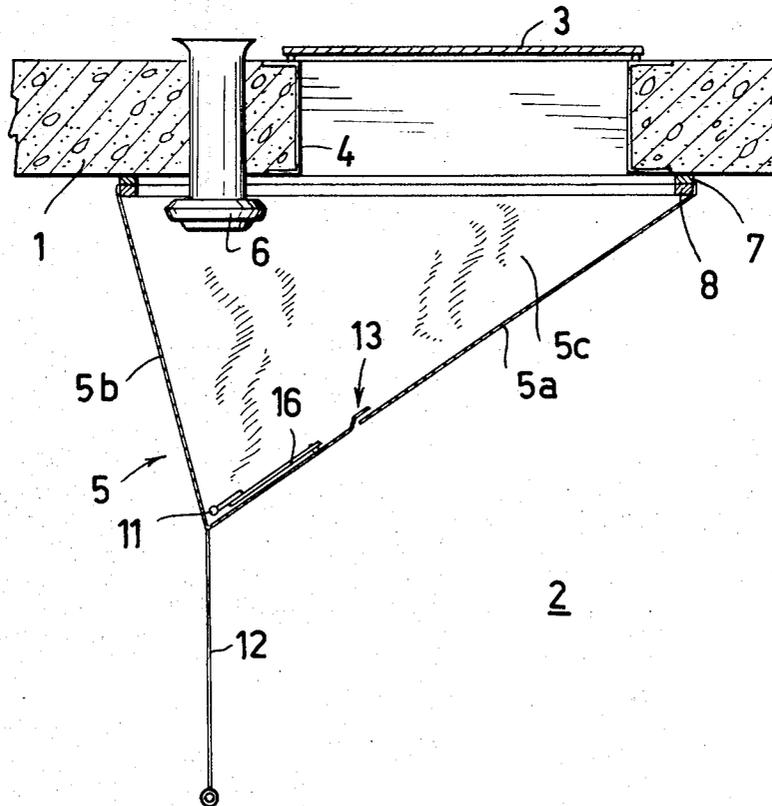
[52] **U.S. Cl.**..... 109/1 R, 49/58
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 135/14 D, 1 R

[57] **ABSTRACT**

A lock chamber for protective enclosures closable by means of a protecting door. The lock chamber is formed by a collapsible shelter made of a flexible gas tight material. The lock chamber is at one side provided with an entrance opening corresponding in size to the opening of said protecting doors and at the opposite side with a vertical closable slit opening. The shelter is intended to be gas tightly fixed around the frame of said protecting door.

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7 Claims, 7 Drawing Figures



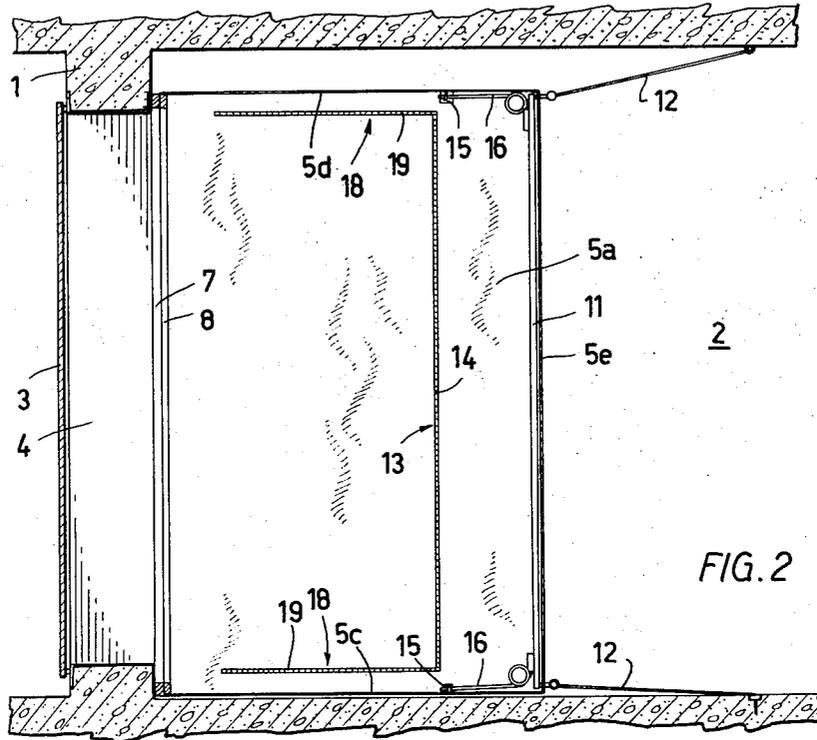


FIG. 2

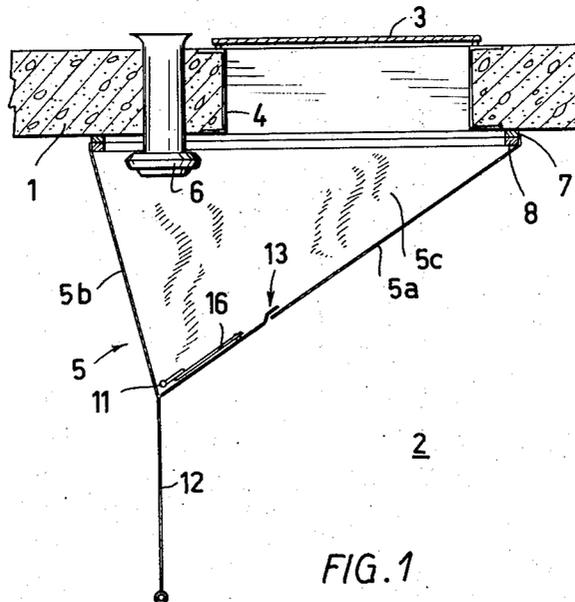


FIG. 1

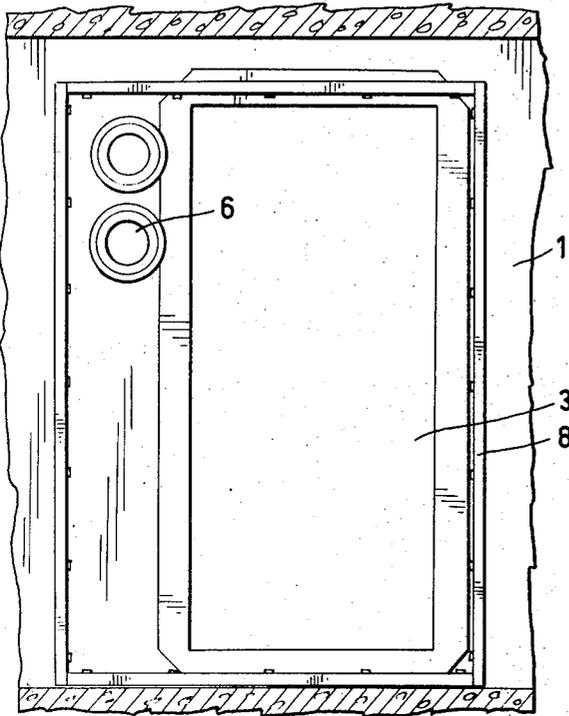


FIG. 3

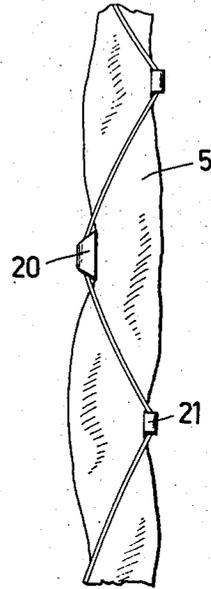


FIG. 6

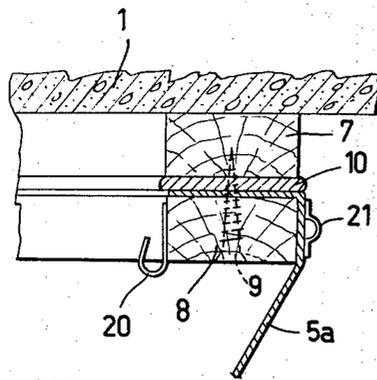


FIG. 5

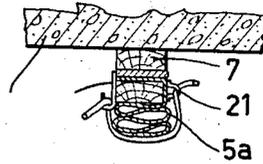


FIG. 7

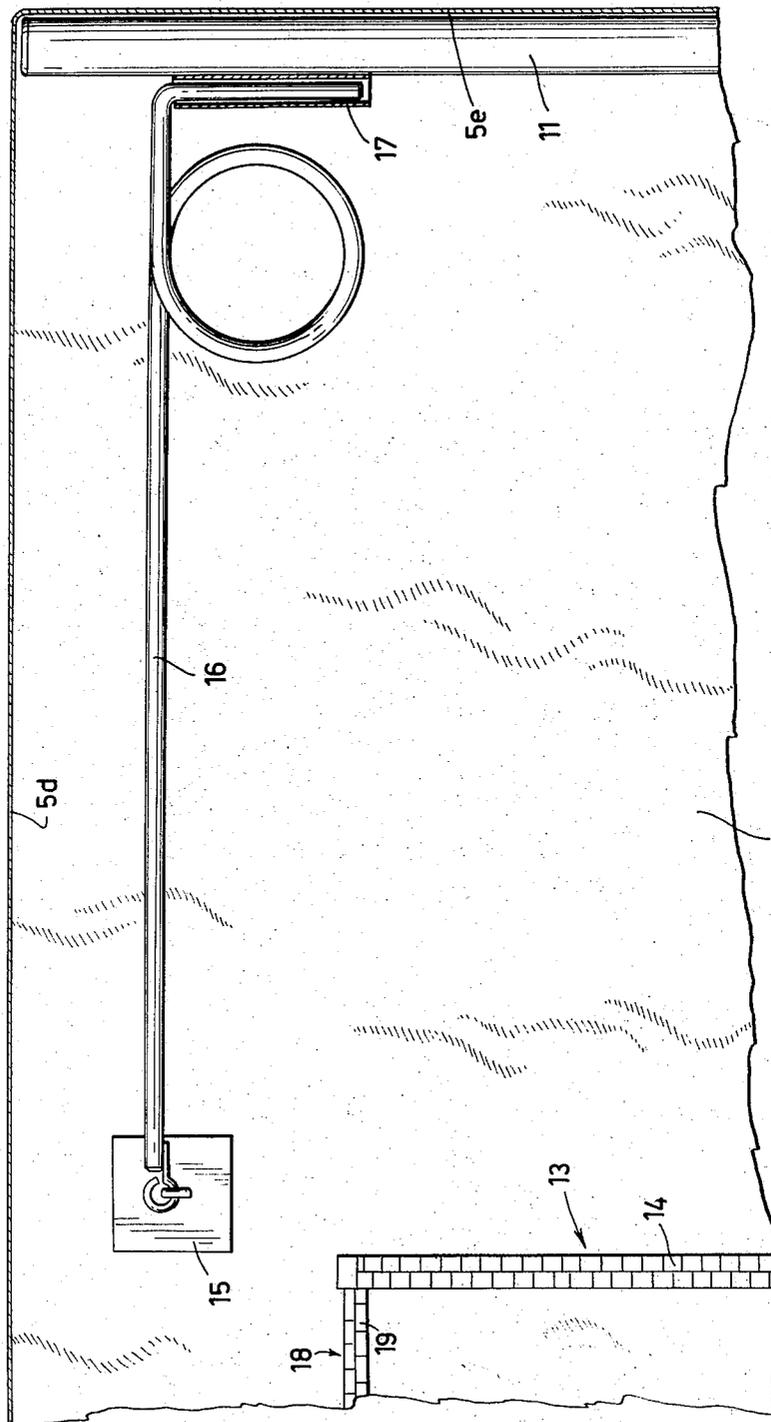


FIG. 4

LOCK CHAMBER FOR PROTECTIVE ENCLOSURES

The subject of the present invention is a lock chamber for protective enclosures and the like for the formation of a cleaning space between the protecting door and the protected space so as to prevent contaminations from coming into the protected space.

According to the present practice, in air-raid shelters a lock room is constructed between the protecting door and the protected space proper so as to prevent the outdoor air containing dangerous materials and contaminants adhering to people coming in from coming into the air-raid shelter when the protecting door is opened. The purpose of the lock room is to allow a person coming from outdoors to clean himself and to remove the air that has come into the lock room out of same before the inner door to the protected space is opened.

The use of a particular lock room is, however, accompanied by several drawbacks. Cleansing a large lock room from contaminated air is a time-consuming operation. As a rule, in civilian use the lock room represents a waste space, and moving through a steel door between the lock room and the protected space makes the moving under normal conditions more inconvenient.

A purpose of the present invention is to eliminate the above drawbacks, and this purpose is achieved by means of the lock chamber in accordance with the invention, which chamber is characterized in that it consists of a collapsible shelter enclosing the said cleaning space and made of a flexible, gas-tight material, which shelter has on one side an opening at least of a size corresponding to the protecting door and being able to be fastened at its edges onto the frame of the protecting door on the side of the protected space, and on the other side there is an entrance opening leading into the protected space and being able to be closed.

In accordance with the invention, a light-weight, detachable, and, when collapsed, storable, gas-tight shelter of a highly advantageous construction and use is provided. The shelter is made so that it has preferably a triangular horizontal section, whereby one side of the triangle acts as a door-size entrance opening directed at the protecting door and the other side acts as an entrance opening directed towards the protected space, which can be opened so as to make it a door-sized opening and which is used as the entrance passage prior to a situation of danger, for stretchers etc. and as the air inlet opening and, during a situation of danger, as a slit-shaped entrance opening. The shelter is made so that it has the smallest possible volume, preferably corresponding to the cleansing operations of one person only, whereby the contaminated air that has come into this shelter can be rapidly expelled and the shelter can be cleansed efficiently.

In civilian use the shelter in accordance with the invention represents an improvement in the respect that after the protecting door it is not necessary to pass through an additional gas-tight door. The waste space caused by the lock room is also omitted.

According to a preferred embodiment of the invention, the entrance opening consists of a slit extending substantially from the ceiling face of the shelter to the floor face vertically whereby the top and the bottom end of the slit are connected to springs which tend to

pull the said ends flexibly away from each other. The springs make it possible to widen the slit to such an extent that a person can pass through the same and thereafter automatically close the slit by pulling the top end and the bottom end of the slit upwards and downwards, respectively, whereby the longitudinal sides of the slit are tensioned and pressed against each other over the entire length of the slit. Also, the slit may be fitted with a zipper for mechanical closing.

The shelter is made of a firm, gas-tight fabric, such as neoprene-nylon fabric or the like.

The invention will be described more in detail below with reference to the attached drawings, which show a preferred embodiment of the lock chamber in accordance with the invention, and in which

FIG. 1 shows a horizontal section of the lock chamber,

FIG. 2 shows a vertical section of the lock chamber,

FIG. 3 shows the fastening frames of the lock chamber as a front view,

FIG. 4 shows, on a larger scale, a side view of the tensioning spring and the vertical support of the lock chamber,

FIG. 5 shows an enlarged cross-section view of the fastening frame,

FIG. 6 shows a part of the lock chamber in the storage position, and

FIG. 7 shows the same as a horizontal section.

In the drawings the wall construction 1 is shown that separates the protected space 2 of the air-raid shelter or other protective enclosure from the outside space and in which a protecting door 3 with frame 4 has been installed.

The lock chamber in accordance with the invention comprises a shelter 5 which has been made of a flexible, gas-tight, firm material and the horizontal section of which has the shape of an equilateral triangle (FIG. 1) and the vertical section of which is rectangular (FIG. 2). The side of the shelter located towards the protecting door 3 is fully open and somewhat larger than the door opening of the protecting door so that at one side of the door opening a free space remains for relief valves 6 installed in the wall construction (FIG. 3). Under these circumstances, the shelter comprises two rectangular vertical side faces 5a and 5b and triangular horizontal floor and ceiling faces 5c and 5d.

For the purpose of fastening the shelter around the door opening, a body frame 7 has been fastened to the wall construction. To the edges of the shelter side facing towards the door opening a fastening frame 8 of equal shape has been fastened, which frame is fastened to the body frame by means of screws 9 through a gasket 10 (FIG. 5).

The vertical corner edge 5e of the shelter located opposite the door opening is provided with a support rod 11 the top and bottom ends of which are fitted with hooks for binding the support rod by means of ropes 12 to the fastening units sunk in the ceiling and floor of the protected space. In this way the shelter can be stretched out.

One side face of the shelter is provided with a vertical slit 13 that extends substantially from the top edge of the side face to the bottom face and that forms an entrance opening through which the air-raid shelter is entered and left during risk of contamination. The slit is provided with a zipper 14. For automatic closing of the

slit, the top and bottom ends of the slit are at positions 15 connected to spring arms 16 inserted into corresponding fastening sockets 17 fastened to the support rod 11 (FIG. 4). The spring arms tend to pull the opposite ends of the slit apart from each other so that the edges of the slit are pressed against each other over the entire length of the slit.

The other side face of the shelter, 5b, is whole. The top and bottom ends of the vertical slit 13 are accompanied by horizontal slits 18 which are likewise provided with zippers 19. The -shaped slit 13, 18 formed in this way permits the opening of the entire side face so that an entrance opening is formed through which it is possible to go or to take fresh air when there is no risk of contamination, as well as, for example, to carry stretchers.

Another important function of the -shaped slit is to permit the shelter being moved entirely to the side from the way of the door opening and being fastened to the frame 7, 8 by binding. When the ropes 12 are detached and the zippers 19 opened, the shelter can be moved against the wall construction. In this way the side face 5b of the shelter can be fastened, together with its support rod 11, to the frame component on the left side of the door opening (FIG. 3), the rectangular door flap of the other side face 5a of the shelter can be bound to the right frame component, the floor face 5c together with the bottom part of the side face 5a can be bound to the bottom component of the frame, and the ceiling face 5d together with the top part of side face 5a can be bound to the top component of the frame. It is to be noted that in this way the door opening of the protecting door remains fully free. For binding the shelter, the frame 7, 8 and the shelter are provided with appropriate hooks 20 and loops 21 (FIG. 6 and 7). If desired, the top and bottom sections and the right part of the shelter may be allowed to remain unbound.

The shelter with its support rod, springs and frames can be supplied as separate components which can be easily assembled at the site by means of simple equip-

ment. For this purpose, the fastening frame 8 preferably consists of four separate components, which can be easily assembled at the corners into appropriate recesses and by means of simple clamps.

The drawing and the accompanying description are only intended to illustrate the idea of the invention. In its details the lock chamber in accordance with the invention may vary widely within the patent claims. For example, the construction of the spring devices can be varied to some extent.

I claim:

1. A lock chamber for a protective enclosure having a protecting door surrounded by a rectangular door frame, comprising a collapsible shelter of flexible gas-tight material having a triangular floor and a triangular ceiling and two rectangular walls joined at top and bottom to two sides of said triangular ceiling and floor, respectively, and open on one side, means for securing said enclosure to a said door frame about said door on said one side of said enclosure, and means defining a vertical slit in one of said two sides extending substantially from said ceiling to said floor.

2. A lock chamber as claimed in claim 1, and spring devices at the top and bottom of said chamber for yieldably vertically extending said slit.

3. A lock chamber as claimed in claim 2, and a vertical support rod in the corner edge of said chamber opposite said open side thereof.

4. A lock chamber as claimed in claim 3, said spring devices being mounted on the upper and lower ends of said rod.

5. A lock chamber as claimed in claim 1, and horizontal slits connected at their ends to said vertical slit to define an entry flap for said chamber.

6. A lock chamber as claimed in claim 5, and zippers closing said slits.

7. A lock chamber as claimed in claim 1, and a zipper closing said slit.

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