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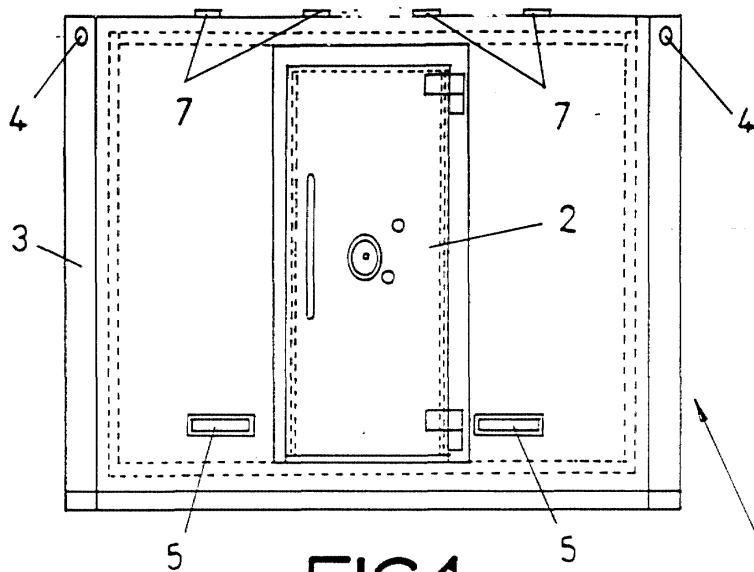
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(54) **Modular armored chamber for storing explosives**

(57) A armored chamber is provided for storing and transporting explosives where the formation of handling and raising means has been envisaged, materialized by means of various elements (3) projected orthogonally towards the outside from the surface of the armored chamber and provided with respective orifices (4) in correspondingly aligned positions. The armored chamber

has inferior and superior airing means (5, 6) of which the inferior ones (5), accessible from the side walls, communicate with a system of parallel, superimposed and separated panels provided with orifices (15) in successively displaced positions, whilst the superior ones (6), made in relation to the upper base, consist of passing orifices that form mouths protected by external caps (7) with respective internal cylindrical projections (10).



**FIG. 1**

## Description

### Purpose of the Invention

**[0001]** This invention refers to a modular armored chamber for storing explosive products. It provides basic novelty characteristics and considerable advantages as regards the known means used for similar purposes in the present state-of-the-art.

**[0002]** More specifically, the invention proposes the development of a armored chamber to be used with materials of the type commented above. It has the particularity of being mobile, movable, with the use of suitable transport means and is constructed with the use of materials and following an operation able to guarantee increased safety of the product enclosed inside it. Furthermore, means ensuring suitable ventilation of the inside space have been provided at the same time in order to eliminate the internal accumulation of gases or the entrance of foreign matter from the outside that could harm, in any way, the explosive contained inside the armored chamber. The ventilation means have also been designed to prevent the introduction, accidentally or on purpose, of any object or matter from the outside.

**[0003]** The field of application of the invention falls within the scope of the industry dedicated to the fabrication of safety containers, more specifically, armored chambers.

### History and Summary

**[0004]** It is a known fact that with certain frequency the transportation of explosive material from one place to another becomes necessary, when it must be finally stored at the place of destination. Evidently, the handling and transport of this type of material require the adoption of a series of precautions that should prevent the fact that explosive material is harmful as a result of such handling or, even due to any other circumstance, any foreign person could have undue access to it. These requirements demand that explosive material be duly treated, both from the point of view of safety during its handling as well as from the point of view of the precautions to be taken to avoid it being stolen or being within reach of other persons not in charge of its care.

**[0005]** Taking into account the above, the fact of providing a system by which it can be effectively ensured that all the requirements and standards corresponding to this type of material has been proposed as the main objective.

**[0006]** This objective has been fully attained by means of the armored chamber of this invention, which is going to be described in detail later on, and by means of which a housing delimited by lateral walls, roof and floor is provided. These are formed by various layers made of metallic, refractory and composite materials that guarantee obtaining an armored and fire-proof block, that has a great structural resistance to its attack with

combined tools and that, therefore, is able to be used with explosives. The panels, which in their design have tongue and groove joints, are attached to each other by continuous welding extended along the respective joints. Furthermore, the armored chamber has a predetermined number of lateral and lower ventilation means conceived as anti-intrusion, that is, made in such a way that the introduction, either accidental or on purpose, both of objects and the hand of an unauthorized person or of any other instrument or tool, is prevented. Likewise, the armored chamber also has upper ventilation means, which combined with the lower ones, establish an air flow to maintain the inside of the armored chamber suitably ventilated. This access is also protected against foreign elements with the help of means, in the form of caps, that cover the inlets.

**[0007]** Lastly, the armored chamber also has means which, adapted to the lower part and to the sides of its surroundings, form support blocks with orifices to facilitate their attachment and elevation with the means and devices suitable for their weight.

### Brief Description of the Drawings

**[0008]** These and other characteristics and advantages of the invention will be more clearly explained following the detailed description below of a preferred performance, given only as an illustrative and non-limiting example, with reference to the attached drawings in which:

Figure 1 shows an elevated front view of a armored chamber constructed in accordance with this invention.

Figure 2 shows an elevated back view of the armored chamber in Figure 1.

Figure 3 shows an elevated side view of the armored chamber of the invention.

Figure 4 shows an upper floor view of the same armored chamber.

Figure 5 shows two views of the upper ventilation means and of the armored chamber attaching means, and

Figure 6 shows a schematic cut view of the lower ventilation means.

### Description of a Preferred Performance

**[0009]** As indicated above, the detailed description of the preferred performance of the invention will be carried out using the attached drawings as the basis, by means of which the same numerical references are used to indicate equal or similar parts. Thus, making ref-

erence to Figures 1 to 3, various views in front elevation, back elevation and side elevation, respectively, can be seen of the armored chamber constructed according to the invention and generally indicated with numerical reference 1. As can be seen, the preferred shape adopted for said armored chamber corresponds to that of a prismatic compartment, with a rectangular base, although there are evidently other shapes are also possible. The armored chamber is provided with a front door 2, constructed in accordance with the various safety standards required for this type of product and through which access can be made to the interior space intended to contain and store the explosive materials. This door is provided with the necessary closing/opening means for its correct and safe operation based on the application for which it is intended.

**[0010]** As can be seen in the elevation views of Figures 1 and 2, the body of the armored chamber 1 is provided along its lateral and lower faces with means 3 common to the body of the armored chamber to permit its handling and raising. These means have been materialized in the way of separated metallic elements projected orthogonally towards the exterior and suitably common to the surface of the armored chamber. This arrangement can be better seen in Figure 4 of the drawings in which four elements 3 appear along each side, although their number may vary. Logically, the orifices 4 of the different metallic elements 3 occupy equivalent positions so that they are aligned in an advantageous way.

**[0011]** The invention has provided the armored chamber with ventilation means both on the lower part as well as the upper. The lower ventilation means are clearly represented in Figures 1 to 3 and are generally indicated with the numerical reference 5. In accordance with the preferred performance, the larger faces of the armored chamber show two inlets for the ventilation system (the form of which will be described later on as regards Figure 6), whilst the smaller side faces show one inlet only for said ventilation means. Once again, this layout is only illustrative, as the distribution of air inlet accesses could be any other depending on each particular necessity.

**[0012]** As regards air outlet accesses provided on the upper part, these are also represented in Figure 4 and materialized as orifices 5 of a suitable shape, whilst in Figures 1 to 3 the protectors 7 supplied for each orifice are shown schematically, in order to avoid the introduction of foreign bodies from the outside either accidentally or on purpose, the constitution of which will be explained later with reference to Figure 5.

**[0013]** In accordance with the above, a highly resistant armored chamber is provided with increased protection characteristics of the explosive product contained on its inside. As a guarantee of this protection against any external attack, its construction is made of wall, floor and roof panels obtained by superimposing the different metallic, refractory and composite material layers. The

result is an armored and fireproof panel highly resistant to the attack of combined tools and, therefore, ensures the best possible protection for the explosive. The panels are formed with conventional tongue and groove joints so that they then become joined up by means of welding along all the respective joints.

**[0014]** As an additional safety characteristic, the invention has foreseen that the inside surface of the body 1 of the armored chamber is completely lined with fireproof wood, of any of the known suitable types available on the market, so that all the metallic parts are duly hidden to avoid any friction or undesired blow, in some circumstances, that could cause deflagration of the explosive.

**[0015]** If reference is now made to Figure 5 of the drawings, a vertical section view of a ventilation orifice of those provided on the upper part of the armored chamber can be seen. In accordance with this representation, it is seen how the orifice 6 passes through the thickness of the upper base 8 of the armored chamber and ends above in a raised mouth portion somewhat higher than the superficial plane of said panel. Surrounding this mouth is element 7 of the protecting cap, which is attached preferably by welding to the surface of said base 8, with the use of three or more legs 9, whilst the inside shows a concentric, cylindrical projection 10 centered approximately with respect to the raised mouth portion. This layout constitutes an anti-intrusion access as it provides enough space for the air to circulate without difficulty and, however, does not permit it to be used by any unauthorized person to introduce undesired objects.

**[0016]** On the other hand, an indicative representation of how the armored chamber is anchored and attached in a desired place is also seen. In this respect, the parts 12 of the lower panel 11, preferably four parts in predetermined positions that provide respective passing orifices 13 that are wider on the upper part for using anchor bolts on the floor or another support surface, with the housing of the head of each respective bolt in the widening of the associated orifice 13, so that said head is hidden by the use of complementary parts (not shown). These parts, which are coupled to the upper part of said widening, result in a superficial continuity of the inside face of the panel 11, with no edges or other undesired roughness.

**[0017]** Lastly, as regards Figure 6, the lower ventilation system of the armored chamber is also shown schematically which, together with the upper orifices 6, permit a current of air to be established that prevent the undesired accumulation of gases inside the armored chamber maintaining the inside space perfectly ventilated. This system also constitutes an anti-intrusion performance and has been materialized based on laminated panels, superimposed in parallel, successively separated from each other by a predetermined distance. Each of these panels has a number of passing through orifices 15. As can be seen, these orifices occupy dis-

placed positions in successive panels so that they are never opposite the orifices corresponding to two adjacent panels. In this way, the possibility of intentional insertion of objects from the outside is avoided, as well as the accidental inlet of water or other substances that could negatively affect the explosive contained inside the armored chamber. In this way, storage of the explosive product under optimum maintenance conditions is guaranteed.

**[0018]** The invention provides a armored chamber for the storage of explosives the construction of which is carried out with materials that give it increased fire-resistant characteristics, for example in the case of fire. The ventilation gaps and the door are protected with intumescent products. In accordance with the experiments to which the armored chamber of the invention has been submitted, the external wall of the armored chamber was exposed to a temperature of 600°C for 2 hours without the inside temperature of the armored chamber exceeding 50°C at any time. Taking into account the type of materials that would normally be kept inside, this circumstance guarantees the integrity of the stored material, and that it will not undergo any alteration in the event that the armored chamber is accidentally subjected to the undesired effects of a fire for a period of time such as has been mentioned above, and that, obviously, it would be sufficient for the safety personnel to intervene.

**[0019]** It is not considered necessary to extend the contents of this description any further so that an expert on the subject can understand its scope and the advantages arising from the invention, as well as to develop and put into practice its purpose.

**[0020]** However, it should be understood that the invention has been described according to a preferred performance and, therefore, may be subject to modifications without this meaning any change in the basis of said invention. These modifications may affect the form, size and/or fabrication materials.

## Claims

1. Modular armored chamber for storing explosives, prepared so that it can be transported with suitable means, as necessary, provided with an armored safety door to access the inside of the armored chamber, characterized by the fact that it is preferably constituted in the way of a general rectangular prismatic body (1) obtained from armored tongue and groove-jointed panels joined together by welds along its respective joints and constructed with metallic, refractory and refractory composite material fillings. The armored chamber has handling and raising means that affect both the lateral walls as well as its base and which are materialized in the way of various separated metallic elements (3) projected orthogonally towards the outside from the su-

perfacial plane of the armored chamber. These elements are provided with respective hooking orifices (4) in correspondingly aligned positions and have also been supplied with lower and upper ventilation means (5, 6), respectively, constituted in the way of anti-intrusion means and arranged so that the establishing of an air current through the interior of the armored chamber is permitted.

2. Armored chamber according to claim 1, characterized by the fact that the upper ventilation means have a number of orifices (6) on the upper base (8) of the armored chamber which, passing through the corresponding panel, come out slightly above the superficial plane of said panel to form a mouth protected by a cap part (7). This mouth is joined to the panel by welding its legs (9) and has a concentric internal cylindrical projection (10) that surrounds the mentioned raised mouth portion of the associated orifice (6).

3. Armored chamber according to claim 1, characterized by the fact that the lower ventilation system has various laminated panels (14), superimposed in parallel, separated from each other, in which the formation of a number of passing orifices (15) has been provided for. These orifices are made in displaced positions on successive panels so that those corresponding to two adjacent panels are, in no case, opposite each other.

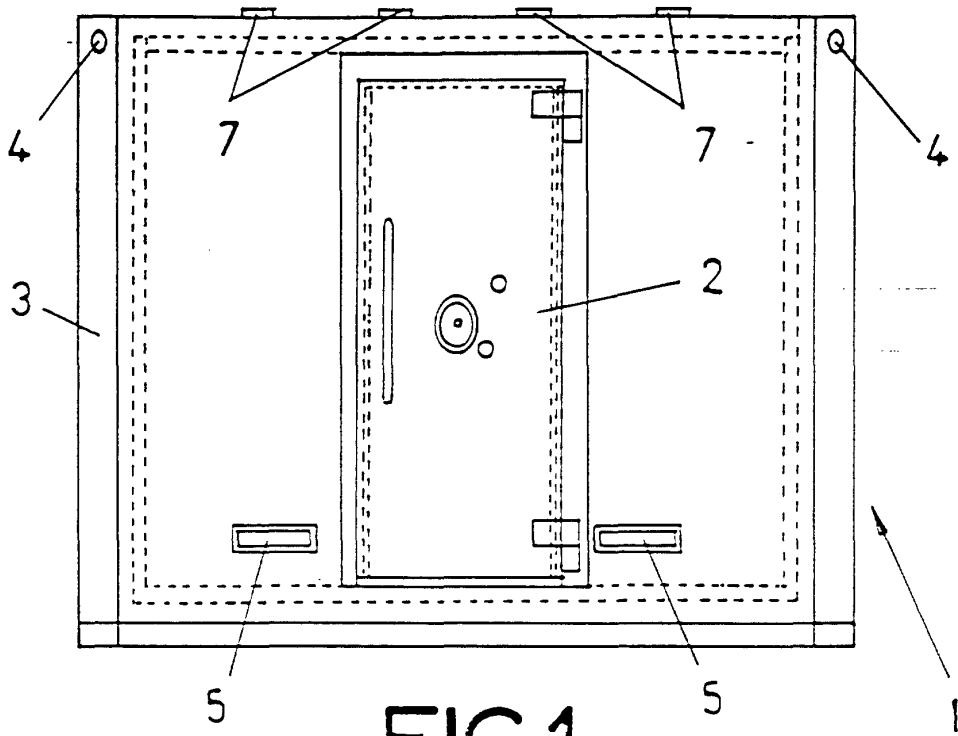


FIG. 1

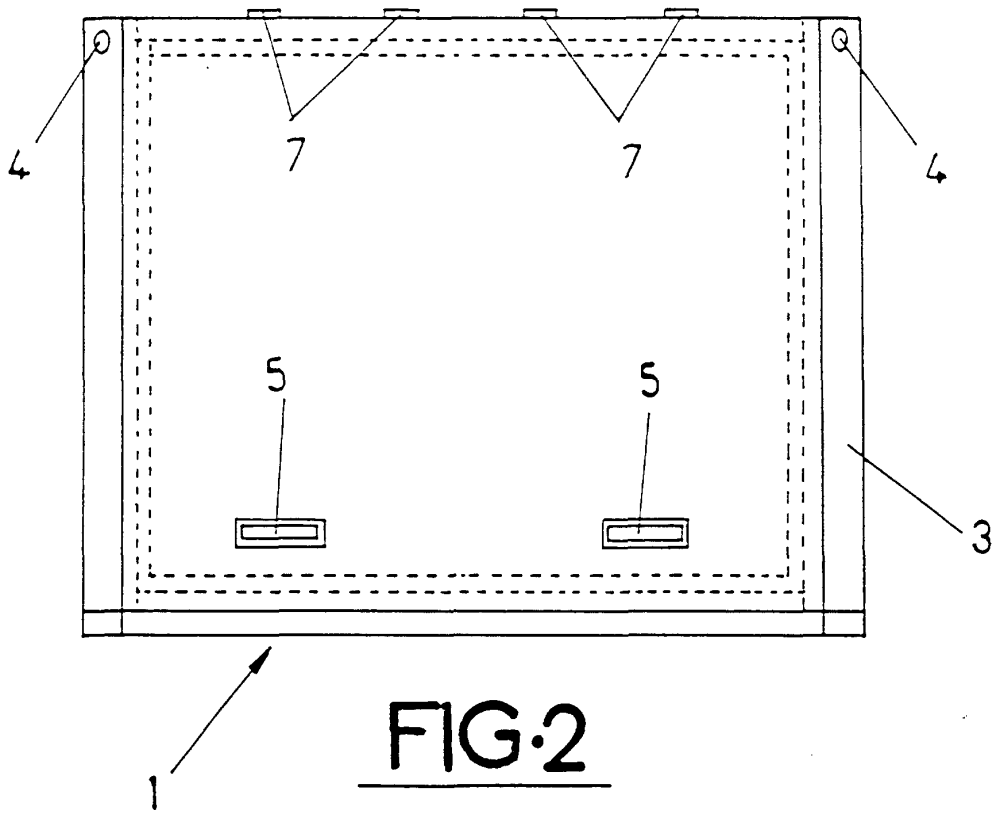


FIG. 2

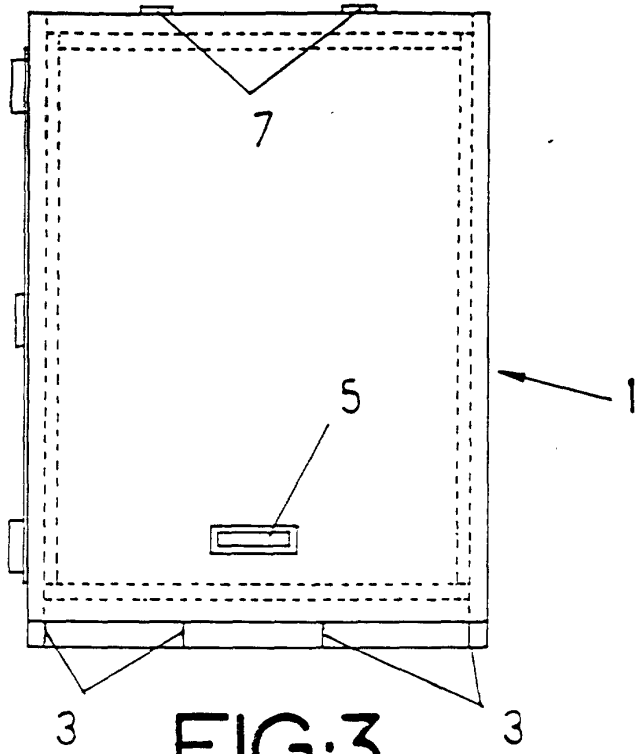


FIG. 3

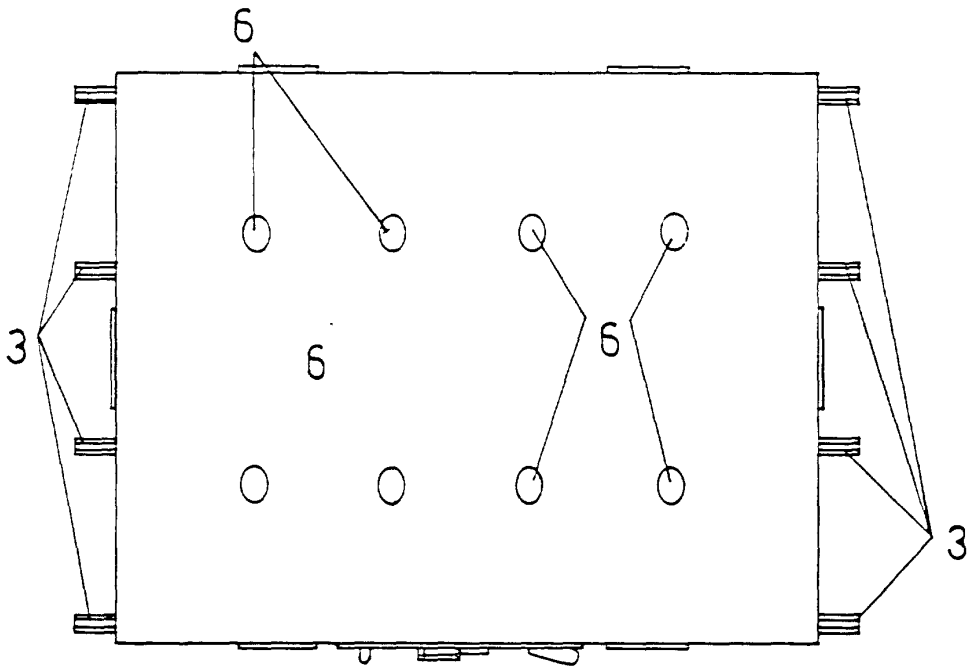


FIG. 4

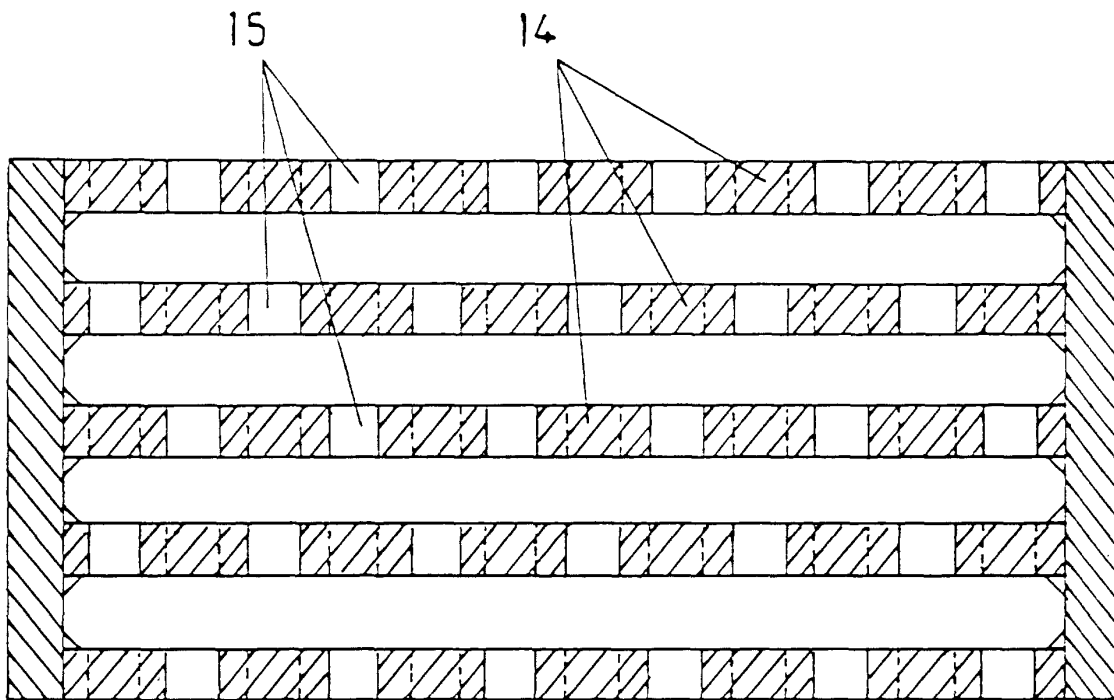
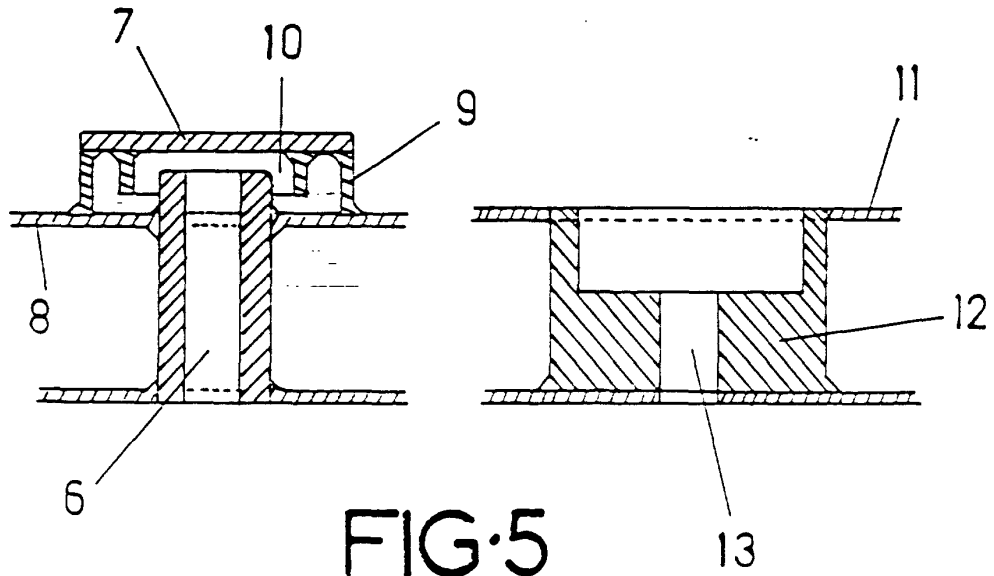


FIG. 6