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(54) **FIRE DOOR OF A VESSEL**

BRANDSCHUTZTÜR EINES GEFÄSSES

PORTE COUPE-FEU D'UN VAISSEAU

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EP 2 995 546 B1

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Description

[0001] The invention relates to a fire door of a vessel which includes a door frame located in a doorway, a door leaf and a slide rail in which the door leaf is installed movably as well as an operating apparatus for moving the door leaf in relation to the doorway and the door frame, and the slide rail is installed in a housing-like top part of the door frame. Such a door is known for example from FR2700186.

[0002] In vessels, hinged and sliding fire doors are used to partition the various sections of the vessel. If a fire starts, the fire area is limited by closing the fire doors around the fire area.

[0003] Recently used sliding fire doors include a door frame, a door leaf, a slide rail system and a power-driven operating system. Sliding fire doors are power-driven and they utilise pneumatic or recently usually electric arrangements. The fire door of a vessel is fastened to an installation opening in the steel structure of the vessel. First, a door frame is fastened and, then, to the door frame are installed a door leaf, a slide rail mounting and means and an operating system for moving the door leaf in relation to the door frame and the installation opening. The slide rail structure, suspended on which the door leaf is moved, is fastened above the door frame and the wall adjacent to the door, and the door leaf is fastened to the slide rail structure.

[0004] Recently, installing fire doors in vessels is laborious work and requires good professional skills. The slide rail system must be carefully fastened to the installation opening and the wall adjacent to it. Problems can be caused by the narrowness of the space reserved for the fire door and its slide rail structure.

[0005] The object of the invention is to introduce a fire door of a vessel by means of which above disadvantages are eliminated. A particular object of the invention is to introduce a fire door of a vessel by means of which the fire door of a vessel is easily and safely installable in its place.

[0006] The object of the invention is achieved with a fire door of a vessel which is characterised by what is presented in the claims.

[0007] It is characteristic of the fire door of a vessel according to the invention that a slide rail is installed on the side of a housing-like top part of the door frame and slide rolls are fastened on the top edge of the door leaf. When the slide rail is readily installed inside the housing of the door frame, there is no need to separately fasten the slide rail structure, whereby this stage will be omitted from the installation. The structure of the housing-like top part of the door frame enables locating the slide rail system into the door frame housing. By installing the slide rail on the side of the housing-like top part of the door frame and by fastening the slide rolls on the top edge of the door leaf, a lot of space is saved above the door leaf, because the structure and its operating apparatus can mainly be located on the side of the door leaf instead of

above it. Thus, a neat, compact and space-saving structure is provided. There is no need to locate other door structures or a separate slide rail structure in the door frame above the door leaf or above the door frame. The space required by such a fire door of a vessel is substantially smaller above the doorway than that of conventional arrangements. A further advantage is that into the housing of the door frame is provided a labyrinth structure, thus achieving the A-60 fire classification.

[0008] According to the invention, a motor and a rack included in the operating apparatus are advantageously installed within a housing in the top part of the door leaf and the rack extends within the door leaf. Thus, the rack takes only a little space outside the door leaf. Such a sliding door structure and an operating apparatus can be installed readily in place and brought installation-ready onto the vessel, whereby there is no need to install them separately.

[0009] In an advantageous embodiment of the invention, the fire door of a vessel includes extension parts of the door frame which are a housing-like extension of the top part of the door frame, an end part and an extension of a doorstep section which are fastened to the door frame, to each other and/or the structures of the vessel. The extension parts of the door frame define, safeguard and ensure the moving requirement of the door leaf. Furthermore, the extension parts of the door frame can be used as adhesion mountings of wall panels or equivalents.

[0010] The invention will now be described in more detail with reference to the accompanying drawings in which

Fig. 1 shows an oblique front view of a fire door of a vessel according to the invention in its closed position,

Fig. 2 shows the fire door of a vessel according to Fig. 1 in its open position,

Fig. 3 shows a vertical section of the fire door of a vessel according to Fig. 1,

Fig. 4 shows a front view of a fire door of a vessel according to the invention without its door frame,

Fig. 5 shows a left-side view of the fire door of a vessel according to Fig. 3 and its top part enlarged,

Fig. 6 shows the right top corner (A) of the fire door of a vessel according to Fig. 3 in a larger scale, and

Fig. 7 shows the right bottom corner (B) of the fire door of a vessel according to Fig. 3 in a larger scale.

[0011] Figs. 1 and 2 show a fire door of a vessel according to the invention installed in a doorway and a wall adjacent to it in the closed position (Fig. 1) and in the open position (Fig. 2). The fire door of a vessel according

to the figures includes a housing-like door frame 1, a door leaf 2, a slide rail (not shown in Figs. 1 and 2) and a power-driven operating system (not shown in Figs. 1 and 2) as well as extension parts of the door frame: a housing-like extension of the top part of the door frame 7, an end part 8 and an extension of a doorstep section 9. The extension of the top part of the door frame 7 is fastened to the top part of the door frame and the wall and it forms its direct extension. The extension of the doorstep section 9 is fastened to the doorstep section and the floor of the vessel and it forms a direct extension to the doorstep. The end part 8 is fastened between the ends of the extensions 7 and 9.

[0012] The vertical section of Fig. 3 shows a housing-like top part (top horizontal part) of the door frame 1 and a fire protection labyrinth 10 within it, a protection pipe 11 of a rack of the operating apparatus, which pipe is located within the door leaf 2, and a slide rail 3 fastenable to the door frame and a slide roll 12 fastenable to the door leaf. The slide rail 3 is installed on the vertical side of the housing-like top part of the door frame and the slide roll 12 is fastened on the top edge of the door leaf at its side. The slide roll 12 is on top of the slide rail 3.

[0013] Figs. 4-7 show a structure of a fire door of a vessel according to the invention and parts included in the structure without the door frame. On the top edge of the door leaf at its side are fastened slide rolls 12 and 13. The first slide roll 12 is at the one top corner of the door leaf and the second slide roll 13 is at the other top corner of the door leaf. When viewing the door and when opening and closing it, the first slide roll 12 is at the rear part of the door leaf, whereby it is designated as the rear top slide roll and the point at which it is fastened is designated as the rear part of the door leaf. The second slide roll 13 is again designated as the front top slide roll. The slide rolls are set on top of and supported by the slide rail 3 being at their point and being parallel with the fire door. Between these slide rolls, there can be one or more slide rolls fastened on the top edge of the door leaf.

[0014] Figs. 4 and 6 show a motor bed 14, an electric motor 4 and a rack 5 fastened to the door leaf 2 of a fire door of a vessel. Figs. 4 and 7 show a slide roll 15 fastened at the right bottom edge of the door leaf of the fire door and the extension of the doorstep 9 and a slide rail 16 located on top of it on top of which the slide roll 15 is. When viewing the door and when opening and closing it, the slide roll 15 is at the rear, whereby it is designated as the rear bottom slide roll.

[0015] When opening the fire door, the electric motor 4 moves the rack 5 which transfers the door leaf 2 in relation to the doorway supported by the slide rolls and the slide rails. The supporting slide rolls in the door leaf are the front top slide roll 13 and the rear bottom slide roll 15. The rear top slide roll 12 only receives lateral force and thus prevents the rear part of the door from moving in the lateral direction.

[0016] By means of the rear slide roll 15 at the bottom in the rear part of the door and the slide rail 16 of the

extension of the doorstep 9, the control of the fire door can be effectively operated also in the lateral direction, that is, as the vessel is heeling over, the door leaf remains in its line in relation to the door frame.

[0017] The invention is not limited to the described advantageous embodiments, but it can vary within the scope of the inventive idea presented in the claims.

10 Claims

1. A fire door which includes a door frame (1) located in a doorway, a door leaf (2) and a slide rail (3), slide rolls (12, 13) are fastened to the door leaf (2), supported by the side rolls the door leaf is movable on the slide rail (3), and an operating apparatus (4, 5) for moving the door leaf in relation to the doorway and the door frame, **characterised in that** the operating apparatus includes a motor (4) and a rack (5) which are installed within the housing at the top part of the door leaf, and the slide rail (3) is installed in a housing-like top part of the door frame (1), and the slide rail (3) is installed on the side of the housing-like top part of the door frame and the slide rolls (12, 13) are fastened to the top edge of the door leaf (2) at its side, and **in that** the rack (5) extends within the door leaf.
2. A fire door according to claim 1, **characterised in that** the fire door includes extension parts of the door frame: a housing-like extension of the top part of the door frame (7), an end part (8) and an extension of a doorstep section (9) which are fastened to the door frame, to each other and/or the structures of the vessel.
3. A fire door according to claim 1 or 2, **characterised in that** at the top edge of the door leaf (2) are fastened slide rolls (12, 13), the first slide roll (12) of which is at the one top corner of the door leaf and the second slide roll (13) is at the other top corner of the door leaf, and that the slide rolls (12, 13) are set on top of the slide rail (3) being at their point and being parallel with the fire door.
4. A fire door according to claim 2 or 3, **characterised in that** at the right bottom edge of the door leaf (2) of the fire door is fastened a slide roll (15), and that on top of the extension of the doorstep (9) is located a slide rail (16) on top of which the slide roll (15) is.

Patentansprüche

1. Brandschutztür, die einen Türrahmen (1) in einer Türöffnung, ein Türblatt (2), eine Laufschiene (3), Laufrollen (12, 13), die an dem Türblatt (2) befestigt sind, wobei das durch die Laufrollen gehaltene Tür-

blatt an der Laufschiene (3) bewegt werden kann, und eine Betätigungsvorrichtung (4, 5) zum Bewegen des Türblatts in Bezug auf die Türöffnung und den Türrahmen umfasst, **dadurch gekennzeichnet, dass** die Betätigungsvorrichtung einen Motor (4) und eine Zahnstange (5) umfasst, die in dem Gehäuse an einem oberen Teil des Türblatts installiert sind, wobei die Laufschiene (3) in einem gehäuseartigen oberen Teil des Türrahmens (1) und auf der Seite des gehäuseartigen oberen Teils des Türrahmens installiert ist, wobei die Laufrollen (12, 13) an der oberen Kante des Türblatts (2) an dessen Seite installiert sind und wobei sich die Zahnstange (5) in dem Türblatt erstreckt.

2. Brandschutztür nach Anspruch 1, **dadurch gekennzeichnet, dass** die Brandschutztür Erweiterungsteile des Türrahmens umfasst, nämlich eine gehäuseartige Erweiterung des oberen Teils des Türrahmens (7), einen Endteil (8) und eine Erweiterung eines Türschwellerabschnitts (9), die an dem Türrahmen, aneinander und/oder an den Strukturen des Fahrzeugs befestigt sind.

3. Brandschutztür nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** an der oberen Kante des Türblatts (2) Laufrollen (12, 13) befestigt sind, wobei eine erste Laufrolle (12) derselben an einer oberen Ecke des Türblatts vorgesehen ist und die zweite Laufrolle (13) an der anderen oberen Ecke des Türblatts vorgesehen ist, und wobei die Laufrollen (12, 13) auf die Laufschiene (3) gesetzt sind, die an deren Punkt und parallel zu der Brandschutztür angeordnet ist.

4. Brandschutztür nach Anspruch 2 oder 3, **dadurch gekennzeichnet, dass** an der rechten unteren Ecke des Türblatts (2) der Brandschutztür eine Laufrolle (15) befestigt ist und dass über der Erweiterung der Türschwelle (9) eine Laufschiene (16) angeordnet ist, auf welche die Laufrolle (15) gesetzt ist.

Revendications

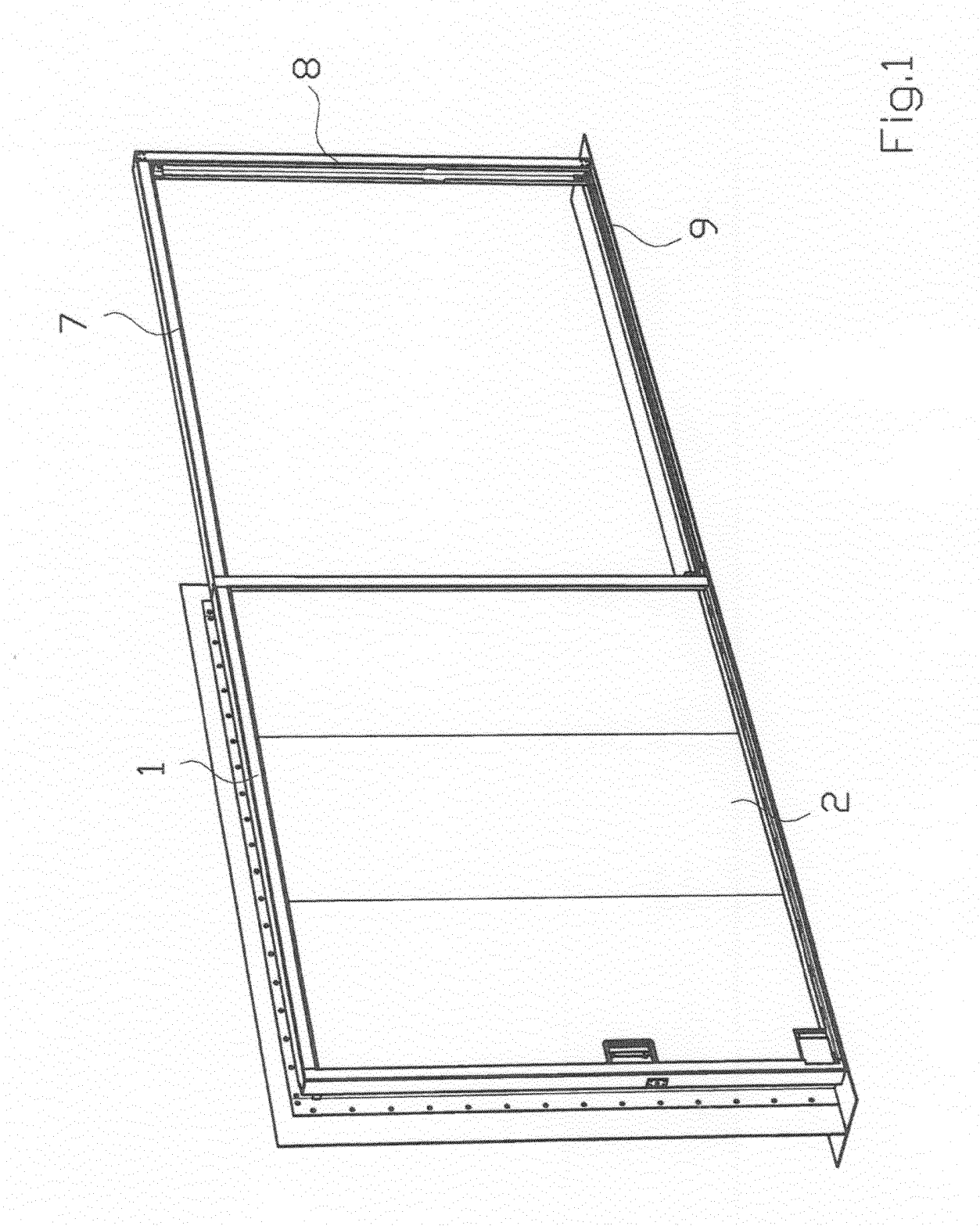
1. Porte coupe-feu comprenant un cadre de porte (1) situé dans une embrasure de porte, un battant de porte (2) et une glissière (3), des roulettes (12, 13) sont fixées au battant de porte (2), pris en charge par les roulettes, le battant de porte peut se déplacer sur la glissière (3), et un dispositif d'actionnement (4, 5) pour déplacer le battant de porte par rapport à l'embrasure de porte et au cadre de porte, **caractérisé en ce que** l'appareil de commande comprend un moteur (4) et une crémaillère (5) qui sont installés dans le logement à la partie supérieure du battant de porte, et la glissière (3) est installée dans une partie supérieure de type logement du ca-

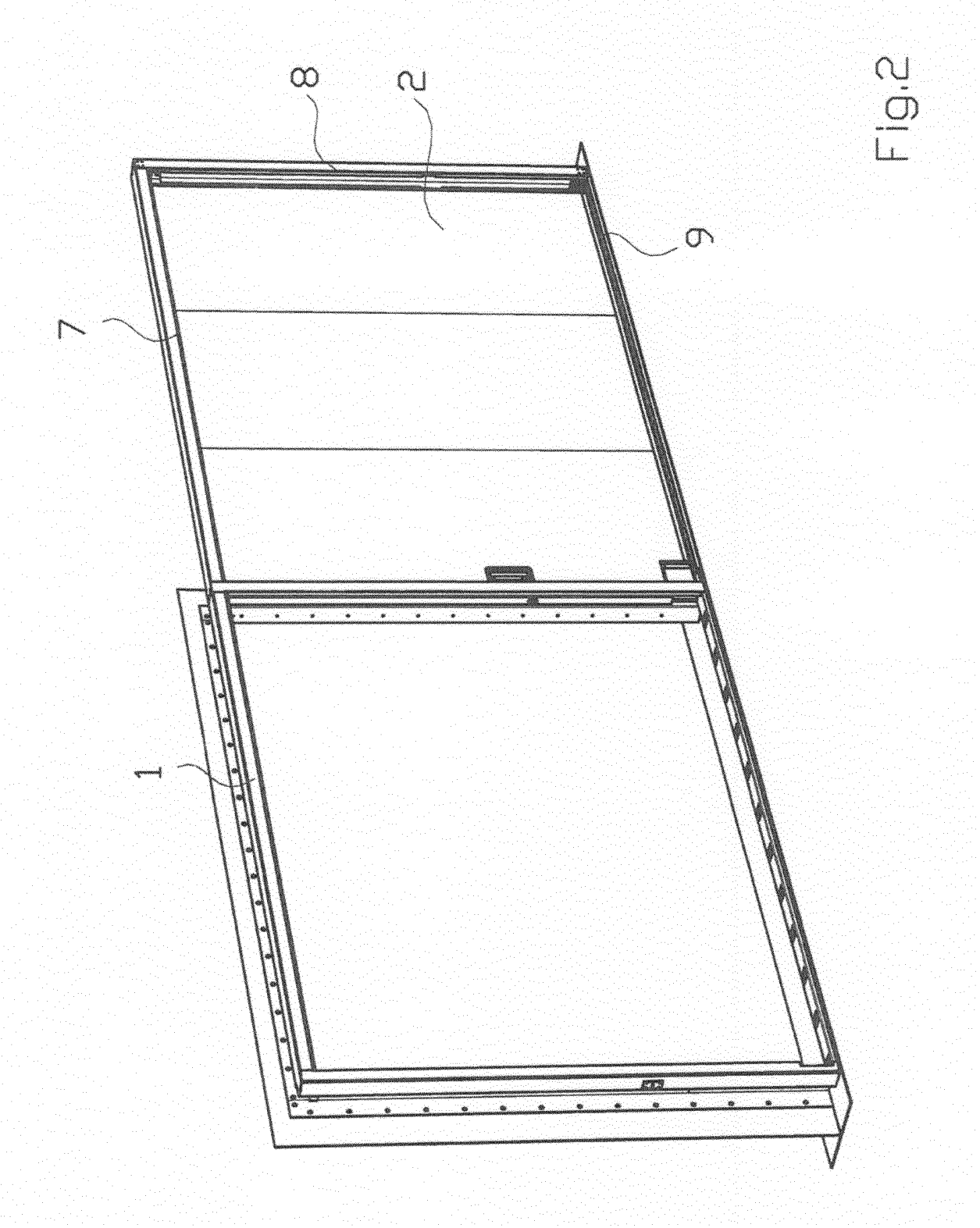
dre de porte (1) et la glissière (3) sont installés sur le côté de la partie supérieure de type logement du cadre de porte et les roulettes (12, 13) sont fixées au bord supérieur du battant de porte (2) sur le côté et **en ce que** la crémaillère (5) s'étend dans le battant de porte.

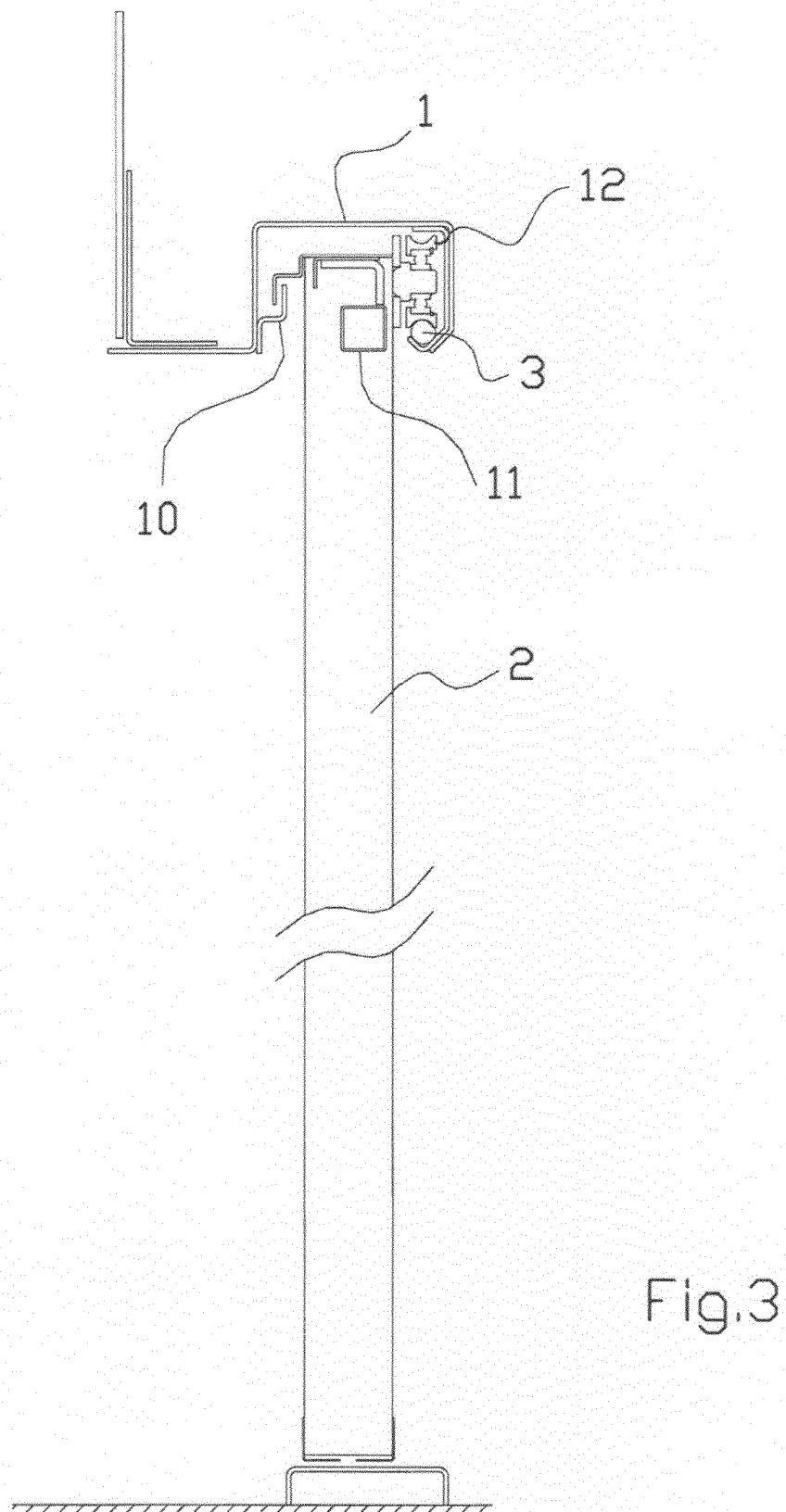
2. Porte coupe-feu selon la revendication 1, **caractérisée en ce que** la porte coupe-feu comprend parties d'extension de type logement du cadre de porte (7), une partie d'extrémité (8) et un prolongement d'une section de pas-de-porte (9) qui sont fixés au cadre de porte, l'un à l'autre et/ou aux structures du vaisseau.

3. Porte coupe-feu selon les revendications 1 ou 2, **caractérisée en ce que** sur le bord supérieur du battant de porte (2) sont fixé des roulettes (12, 13) dont la première roulette (12) est située à l'un des coins supérieurs du battant de porte et la seconde roulette (13) est située à l'autre extrémité du battant et que les roulettes (12, 13) sont placées sur le dessus de la glissière (3), à leur sommet et parallèles à la porte coupe-feu.

4. Porte coupe-feu selon les revendications 2 ou 3, **caractérisée en ce qu'**au niveau inférieur droit du battant de porte (2) de la porte coupe-feu est fixé une roulette (15), et **en ce qu'**au niveau de l'extension du pas-de-porte (9) se trouve une glissière (16) au-dessus de laquelle la roulette (15) est située.







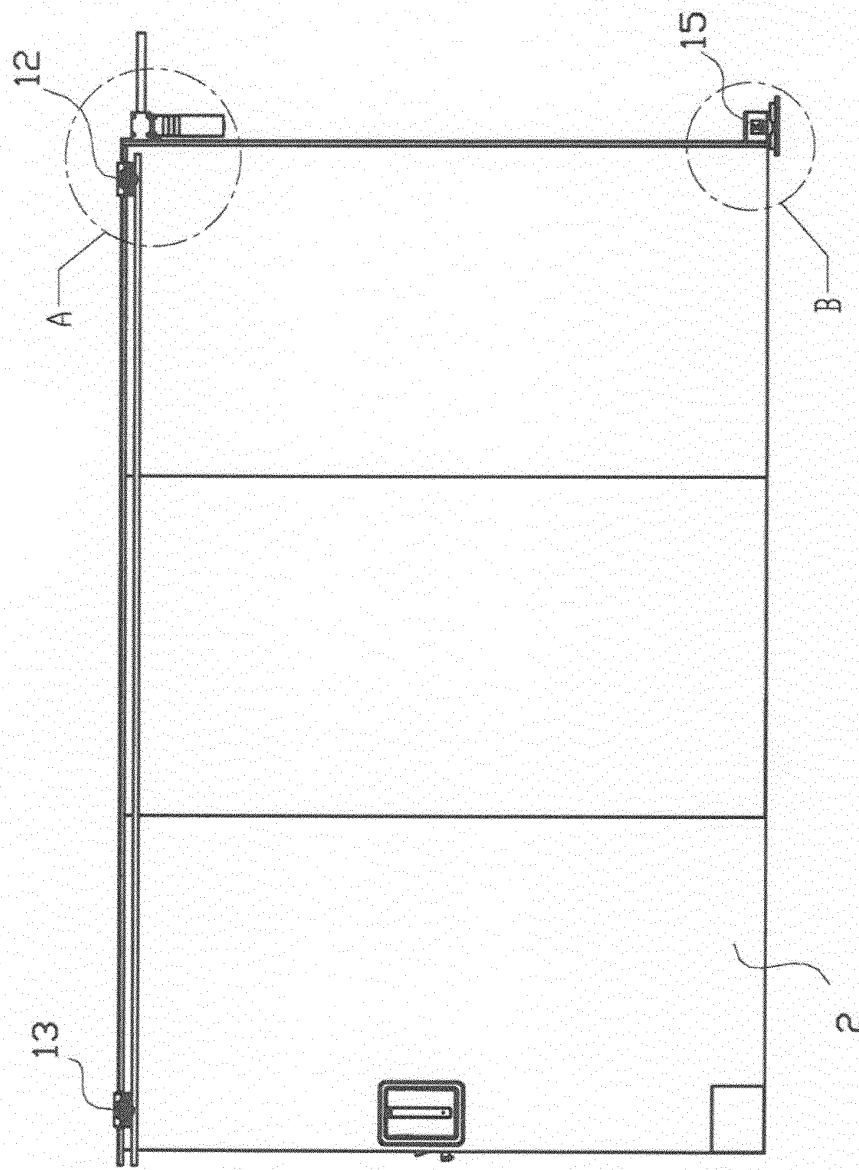


Fig. 4

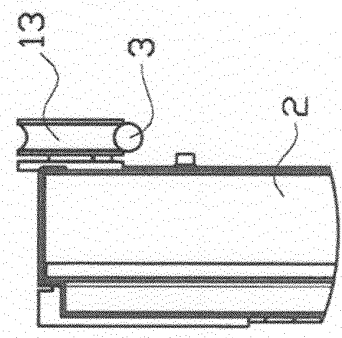
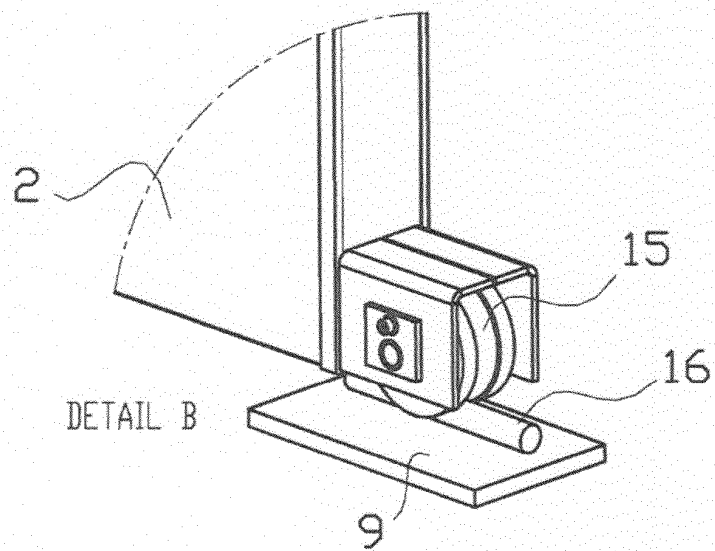
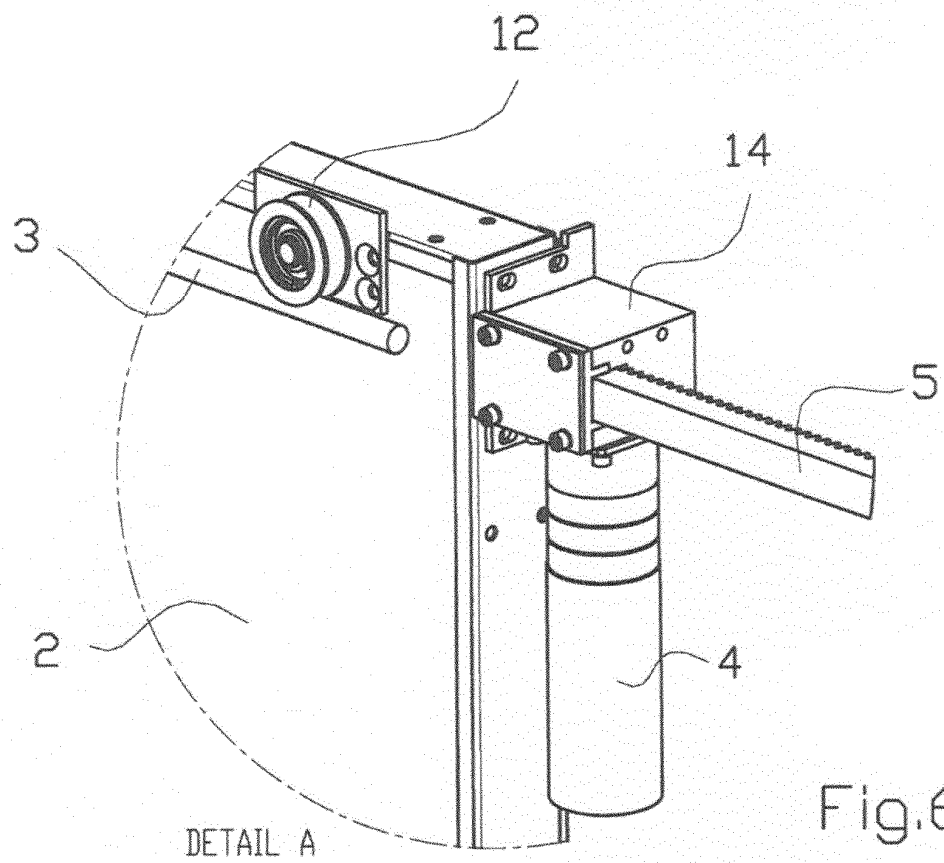


Fig. 5



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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