



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
13.02.2008 Bulletin 2008/07

(51) Int Cl.:
E04H 5/02 (2006.01)

(21) Application number: **07425494.7**

(22) Date of filing: **31.07.2007**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC MT NL PL PT RO SE SI SK TR
Designated Extension States:
AL BA HR MK YU

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(30) Priority: **10.08.2006 IT AP20060005**

(54) **Pressurized gas station with compartments and steel and concrete prefabricated structure**

(57) The aim of the invention is to supply all the features missing in the current technology, since the current pressurized gas stations are simple permanent, unmovable, not-prefabricated structures featured by inadequate fire-resistance and safety against explosion, without air-ventilation for the heavy gas lost under the floor, lack of toughness of the entrances.

The design is basically marked by the following features:

G. The structure in the whole with double checkerboard sheet metal walls, cavity walls filled with lightweight con-

crete and anchor bars welded to the base;

H. Capability for the structure to be moved to new sites safeguarding the economical investment and the new operating needs;

I. Both the modular units and architectural shape of the central complex increase the capacity for the gas cylinder housing as well as operational development;

J. Reduced time to get permission by the Authorities, no building permit is needed since the volume can be considered as a movable and prefabricated construction (as a container) and the reduced erecting time since the station is not built on site, as well.

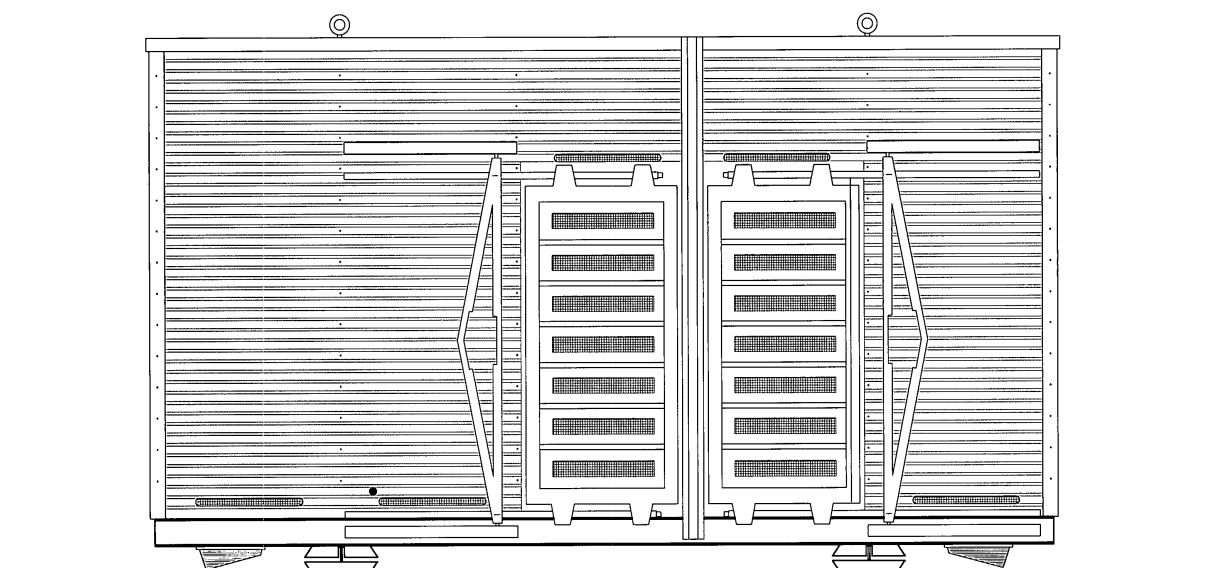


Fig. 6

Description

[0001] In Italy, legal measures regarding the storage of movable containers (cylinders of gas) refer to the Italian Home Office (Ministero dell'Interno) Circular # 74 of 20th September 1956, DPR 280655, title III "Safety Standard for Building and Management of LPG

[0002] Storage into Containers up to 5 000 kgs (more than our invention requires)" and to the consequent D.M. 13th October of 1994 for Containers more than 5 000 kgs.

[0003] Current pressurized gas stations are simple permanent, immobile, not-prefabricated structures featuring inadequate fire-resistance and safeguards against explosion, without air-ventilation to vent fumes from heavy gas lost under the floor, and lack of toughness of the entrances.

[0004] The aim of this invention is to supply all the features missing in the current technology.

[0005] The Pressurized Gas Unit - to be used in the decompression station of pressurized gas contained in cylinders - is divided into compartments using fire-barriers walls that allow a reduction of the outdoor safe distance to 50% depending on the full potential of the station.

[0006] The following drawings show the designed characteristics for the invention, based on the "Norms of Good Technique" with regard to safety against fire/explosion.

1. Fig. 1/6: Base frame with welded HE180A, HE180B-type girder

2. Fig. 2/6: Section A-A, construction details for indoor and outdoor as:

- a. Double checkerboard sheet metal walls filled with cement-expanded clay mixture, suitable thickness granting solidity, gas-tight sealing, class of fire insulation not less of 180;
- b. Roofing in breakable fibercement sheets and waterproofing sheath laying lower than the top level, so that the perimeters walls over the roofing operate as fire-barriers;
- c. Protective flashing;
- d. Lifting ringbolts;
- e. Inside frames ventilated;
- f. Perimeter openings for ventilation;
- g. Under-floor channels for ventilation;
- h. Moulded-fairing base supports;

3. Fig. 3/6: Layout for the entrances to the 5 units, metal-sheath casing for outgoing gas pipes and for under-floor ventilation channel connections; when necessary, that will allow an increase in the air flow to any unit after its isolation at ground level;

4. Fig. 4/6: Layout for the fibercement roofing of the 5 units laying under the top level; on the right side it is, also, shown the partition wall between the entrances that will operate as fire-barrier;

5. Fig. 5/6: Front view 'A' - external door frames sim-

ilar in characteristics to the main structures; an effective resistance against explosion hazards will be obtained by strengthened steel bars put into it and along the perimeter of the frame to lock the door; in order to open the door the bars will be unlocked by a handle moving horizontally along its slide guide;

6. Fig. 6/6: Front view 'B' - overall lengthwise view shows # 2 door frames as in drawing # 5 with the partition wall between them that will operate as fire-barrier, openings for ventilation, inside rain drainage, moulded-fairing supports;

7. 3D front view of the station with actual details of walls, frames, base supports;

8. 3D side view of the station with actual details of walls, frames, base supports;

[0007] Basically the following specific features characterise the invention:

- A. The structure in the whole with double checkerboard sheet metal walls, cavity walls filled with lightweight concrete and anchor bars welded to the base;
- B. Tough metal volume capable of gas cylinders centralization and for various low pressure gas distribution and their associated advantages in technical, economical, practical, safety matters;
- C. Capability for the structure to be moved to new sites safeguarding the economical investment and the new operating needs;
- D. Both the modular units and architectural shape of the central complex increase the capacity for the gas cylinder housing as well as operational development;
- E. Reduced time to get permission by the Authorities since no building permit is needed because the volume can be considered movable and prefabricated construction (as a container);
- F. Reduced erecting time since the station is not built on site.

[0008] Pressurized Gas Station With Compartments And Steel And Concrete Prefabricated Structure is a complex and technological module.

The design is compliant to the relevant rules against fire hazards and is basically marked by the following features:

Claims

1. The structure in the whole with double checkerboard sheet metal walls, cavity walls filled with lightweight concrete and anchor bars welded to the base;
2. Over-roofing partition walls inside, between units, and outside, between the entrances, that will operate as fire-barriers;

3. External door frames similar in characteristics to the main structures; an effective resistance against explosion hazards will be obtained by strengthened steel bars put into it and along the perimeter of the frame to lock the door; in order to open the door the bars will be unlocked by a handle moving horizontally along its slide guide; 5
4. Double ventilation system both in perimeter and under-floor and special channels for heavy gas running into under-floor compartments, beneath the relevant unit. 10

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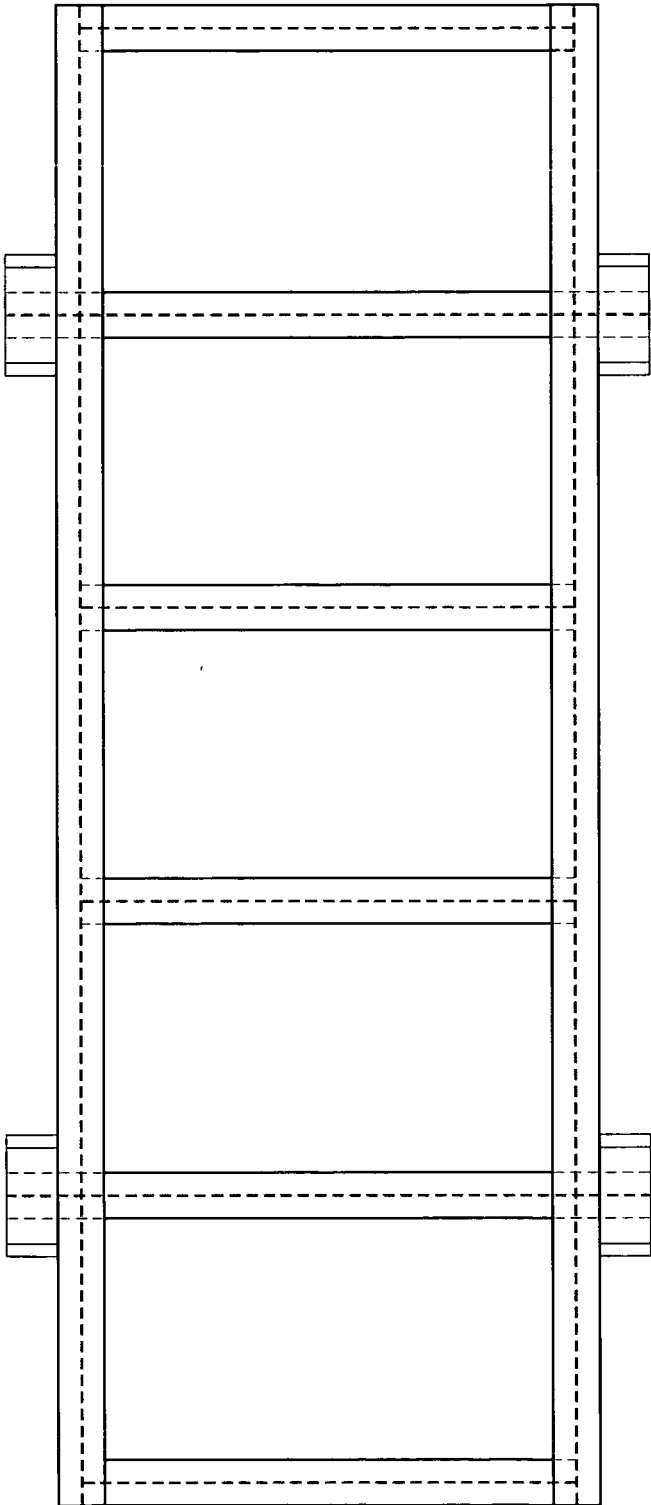
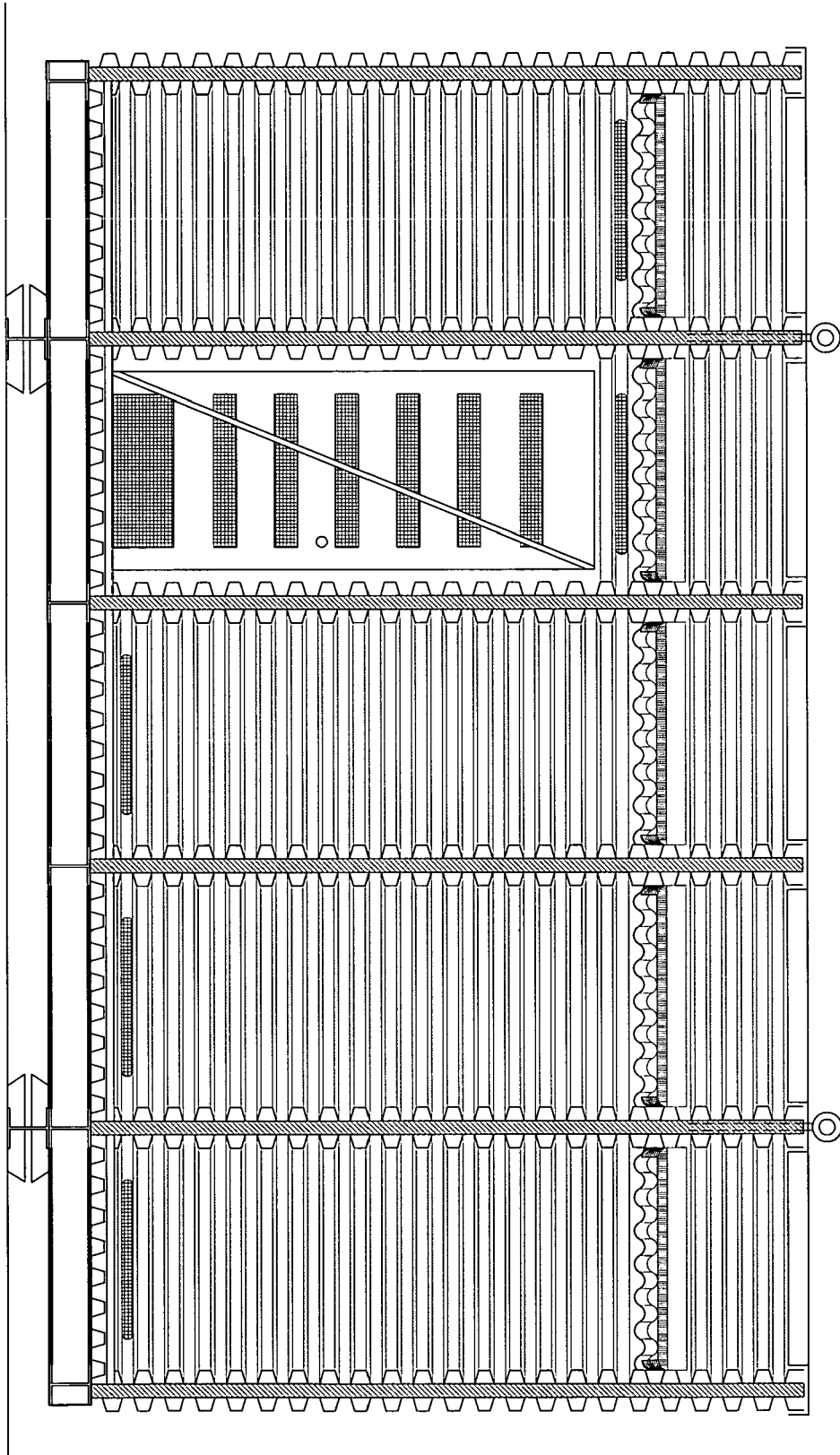


Fig. 1/6

Fig. 2/6



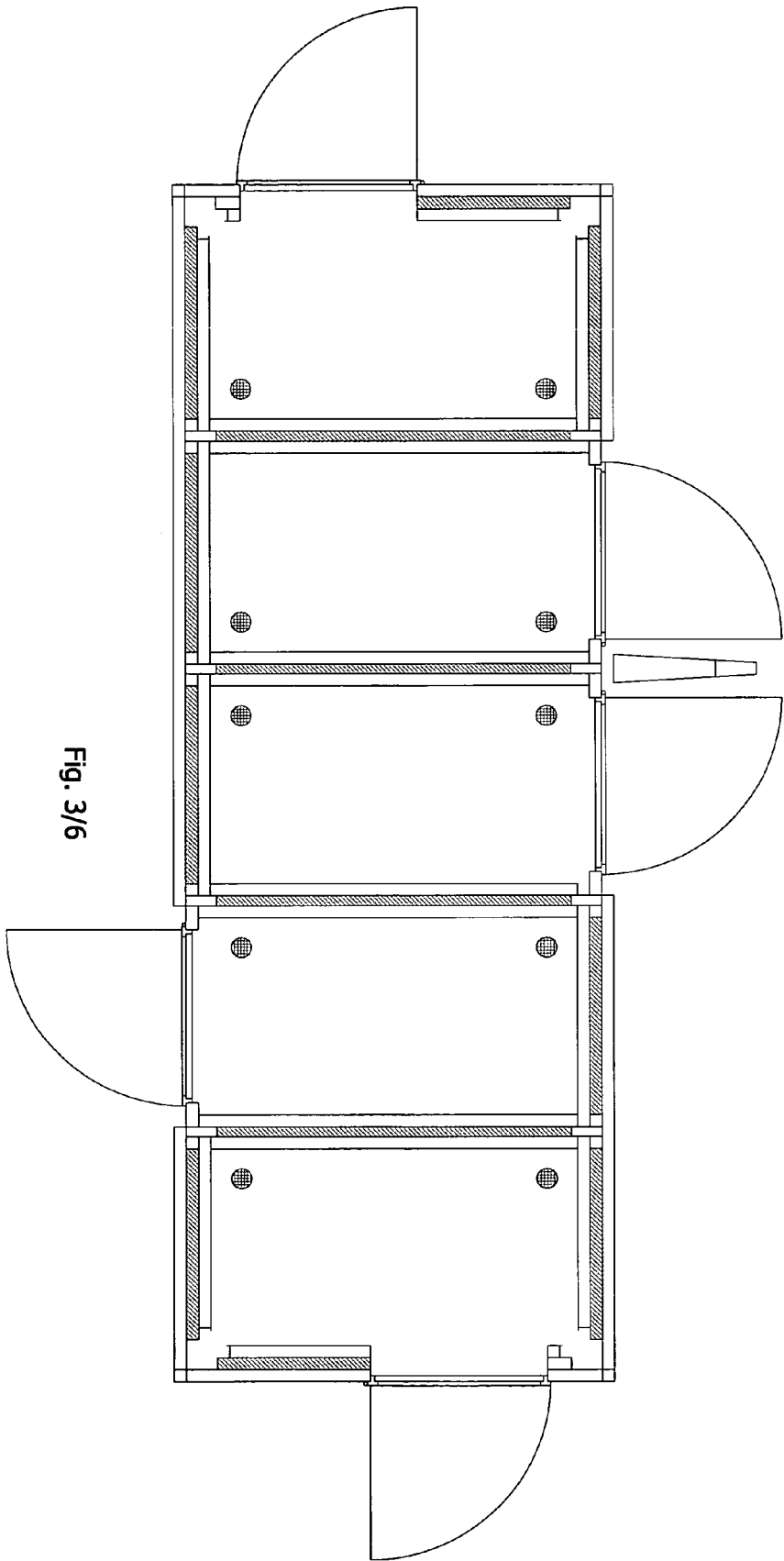


Fig. 3/6

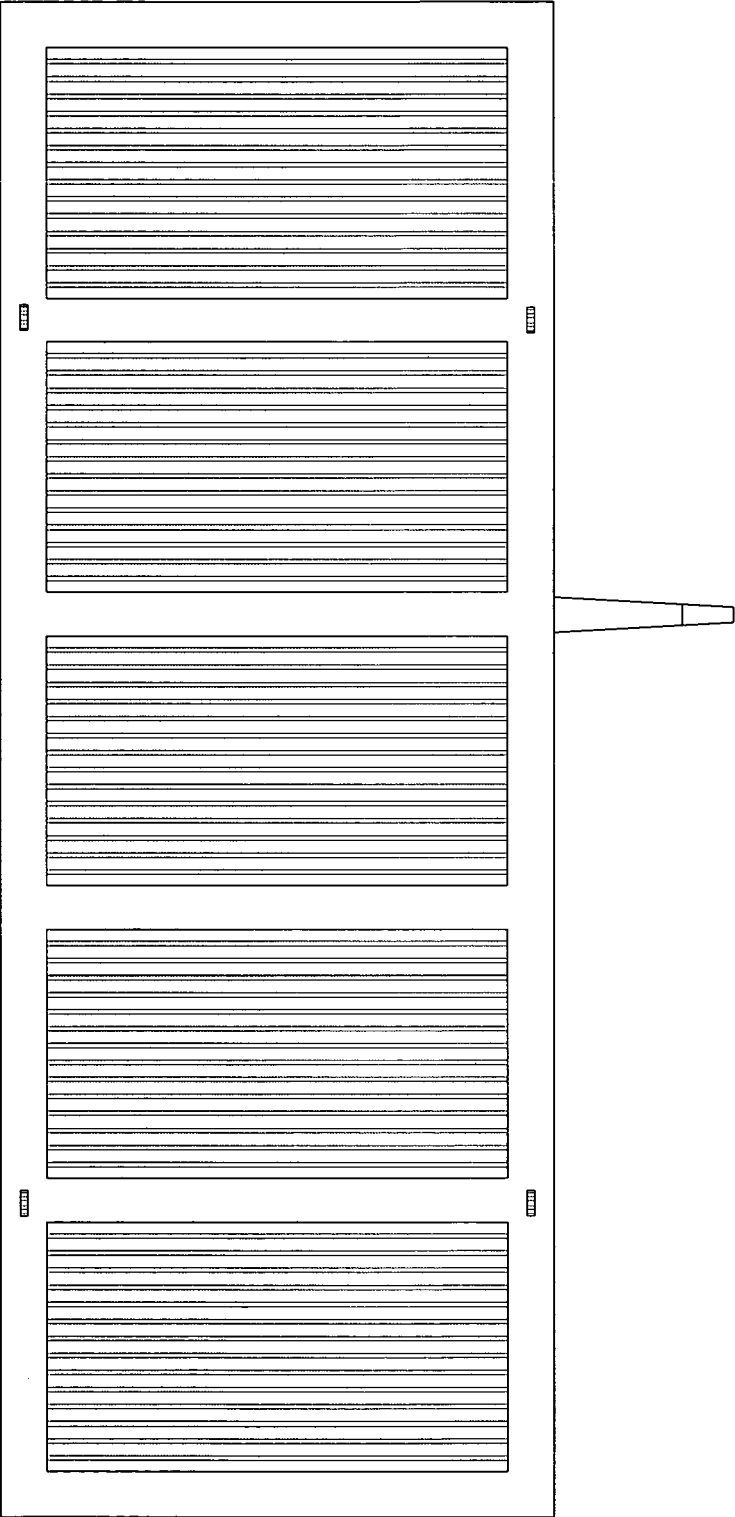


Fig. 4/6

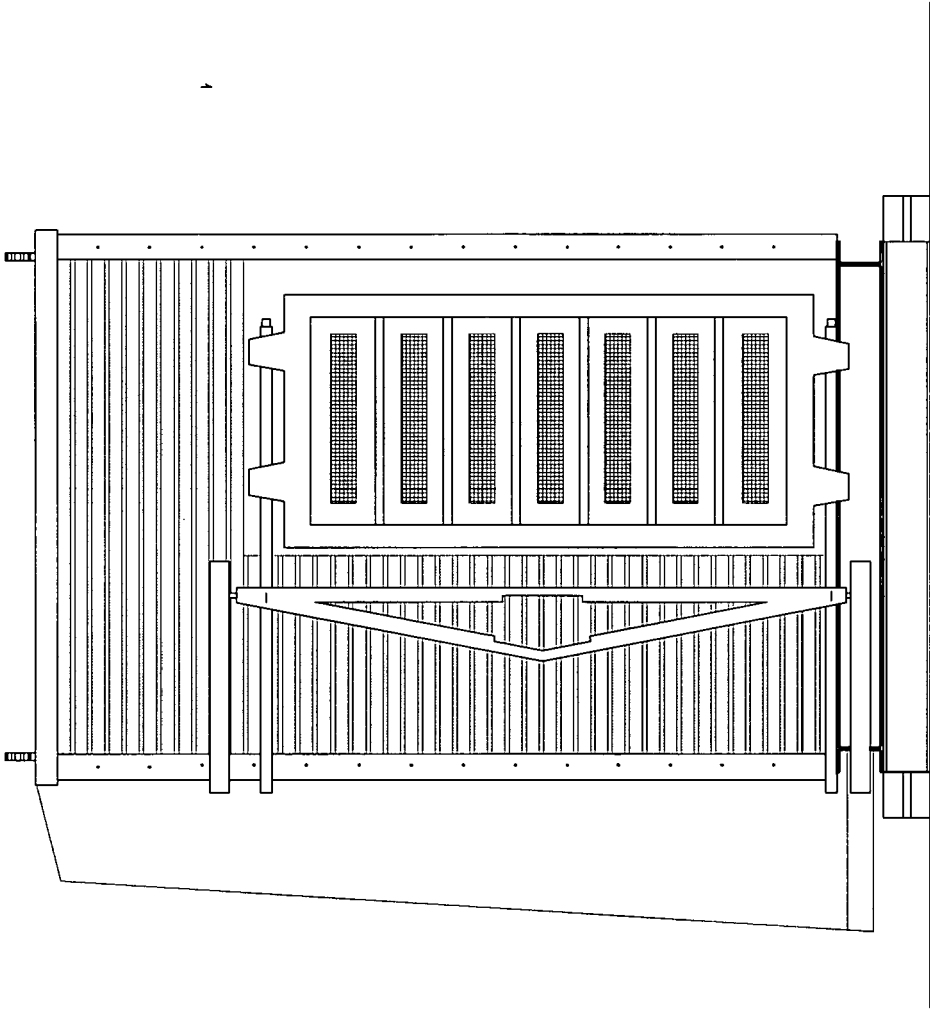


Fig. 5/6

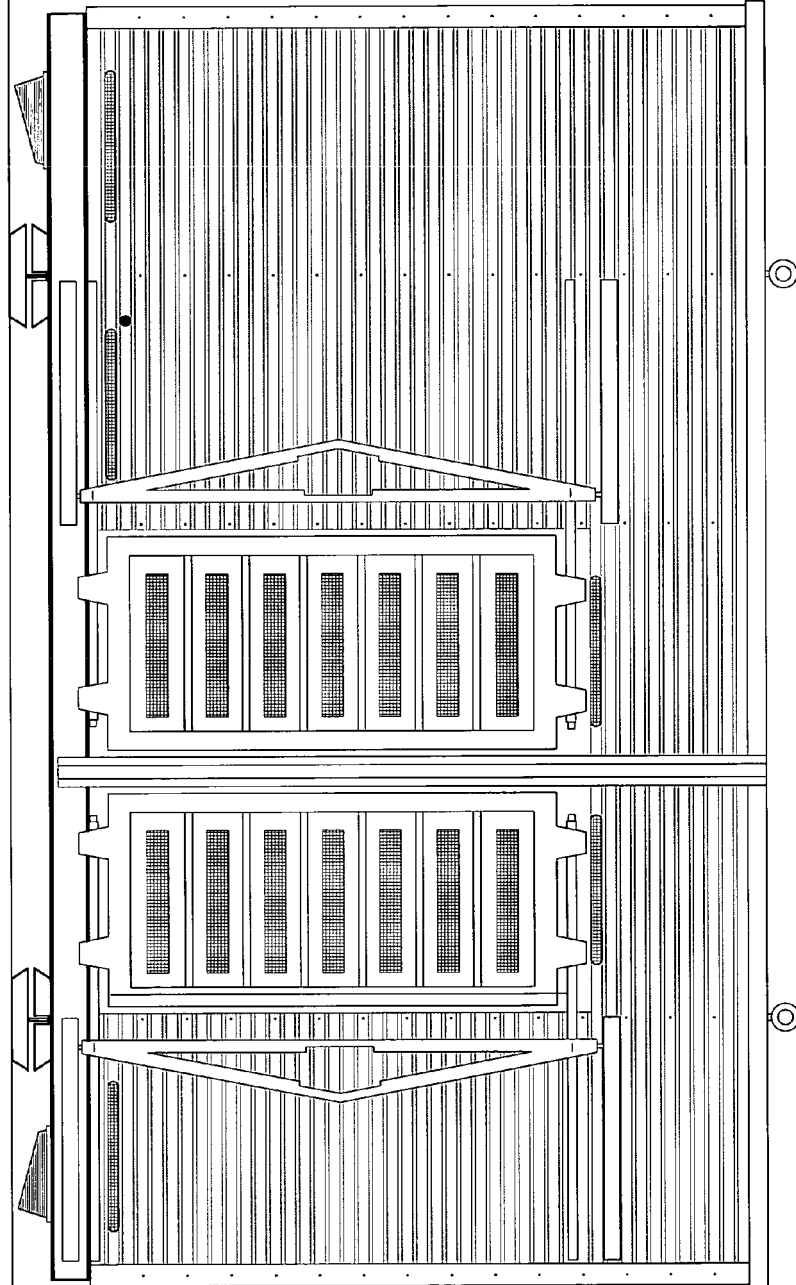


Fig. 6/6