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Declarations under Rule 4.17:

— *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

— *of inventorship (Rule 4.17(iv))*

Published:

— *with international search report (Art. 21(3))*

(54) **Title**: JIGS AND FIXTURES OF CNG CONTAINERS FOR MOTOR VEHICLES

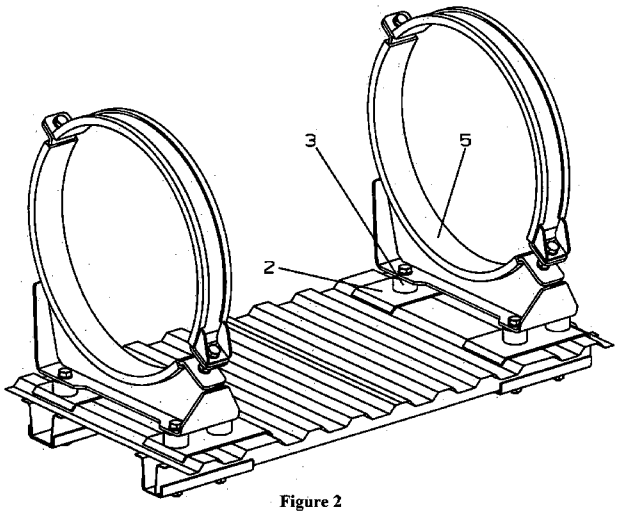


Figure 2

(57) **Abstract**: This is to the search for the way to hold the gas containers on the carrier of vehicles and to create the parts suitable for actual use and meet the auto parts manufacturing standard while emphasizing on the worthiness, strength and safety.

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JIGS AND FIXTURES OF CNG CONTAINERS FOR MOTOR VEHICLES

Field of the Invention

The invention of CNG container jigs and fixtures for motor vehicles is based on the knowledge fields of mechanical engineering and product design.

Related Background Art

For purpose of responding to Thai Government's policy which campaigns for using the alternative energy after facing the crisis of unstable oil price due to the external factors which are beyond the reasonable control. The compressed natural gas or CNG is an alternative energy that is accepted by the owners of motor vehicles, both domestically and internationally. Therefore, the jigs and fixtures of CNG containers for motor vehicles are developed and invented by significantly emphasizing on the convenient and fast installation and maintenance, including the driver's safety and economy. Moreover, it allows the country to save a large money by reducing the import of CNG setting equipment. This also provides the added value for the motor vehicle industry in Thailand so it increases the money flow in the country and allows the country to have the growth and development by relying on the existing resources and potential by the way of self-reliance.

Description and Object of the Invention

This invention is for developing the form of installation using the techniques and equipment designed for making the specific jigs and fixtures of CNG containers for motor vehicles. The equipment will be mounted to the splice beams under the carrier and the gas container supporting set and it will be locked by the couplings for its strength and more safety of the owners of CNG container installed vehicles.

Disclosure of the Invention

This is the invention of components for holding CNG container to the splice beam under the carrier which are sorted out by the component for holding the container and the parts mounted to the splice beam under the carrier. All components are designed and created under the auto parts manufacturing standard.

Processes of Parts Invention and Installation

1. Drill the metal sheet; fold and make it in U-shape profile; connect it with nuts and use it to cover the splice beam under the carrier at the bottom of vehicle;
2. Drill the metal sheet, fold and make it into the shape, its wings at both sides should be the oblique angle at 45°-60° and use it as the couplings covering the top of carrier;
3. Make a hole in the metal of cylinder or angle shape for laying the gas container;
4. Make the screw case by cutting the seamless for holding the screw tension when tightening;
5. Prepare the gas container supporting set to be mounted to motor vehicles;

Steps of Installation

1. Make the passing holes on the carrier for tightening the screws as per the required positions for mounting the jigs and fixtures of the gas container supporting set; Make the holes on the splice beam under the carrier and coat the hole slip with rust-proof paint;
2. Cover the carrier by the coupling ② , which is folded at the oblique angle of 45°-60°; set the holes on the coupling in the same position as the holes made at the middle of crossbeam of the carrier;
3. Put the supporting bar for the cylinder container ③ on the coupling ② and set its holes in the same position as the holes on the coupling ②;
4. Lay the gas container supporting set ⑤ on the above said supporting bar ③ and set its holes in the same position as the holes on the above said supporting bar ③ ;
5. Insert the screw case ④ into the gap between the beam and carrier;
6. Join the long coupling ① with the splice beam of the carrier and set the screw holes in the same position as the holes on the above said splice beam;
7. Thread screw through the holes of gas container supporting set ⑤, the supporting bar for cylinder container set ③, the upper coupling ②, the carrier

surface, the screw case ④, the beam under the carrier and tighten the screw with the upper coupling ①;

8. Check the tension of screws after finishing the steps of installation;
9. Install another upper coupling set at the tip of another side;
10. Install another 2 locking sets by using the short lower couplings ⑥ according to the steps specified above;

Best Mode for Carrying out the Invention

As described in the section "Disclosure of the Invention".

Claims

1. The lower couplings (U or C shape), drilled and connected by nuts to the hole ①, ⑥ ;

2. The upper couplings of which wings are folded at the oblique angle of 45°-60° ② , the supporting bar for the container in type of cylinder or angle ③ , the screw case ④ the container supporting set with fastener ⑤ ;

3. The type of parts designed and made, and the instructions for assembling the coupling set for locking the gas container supporting set with the frame on the tray;

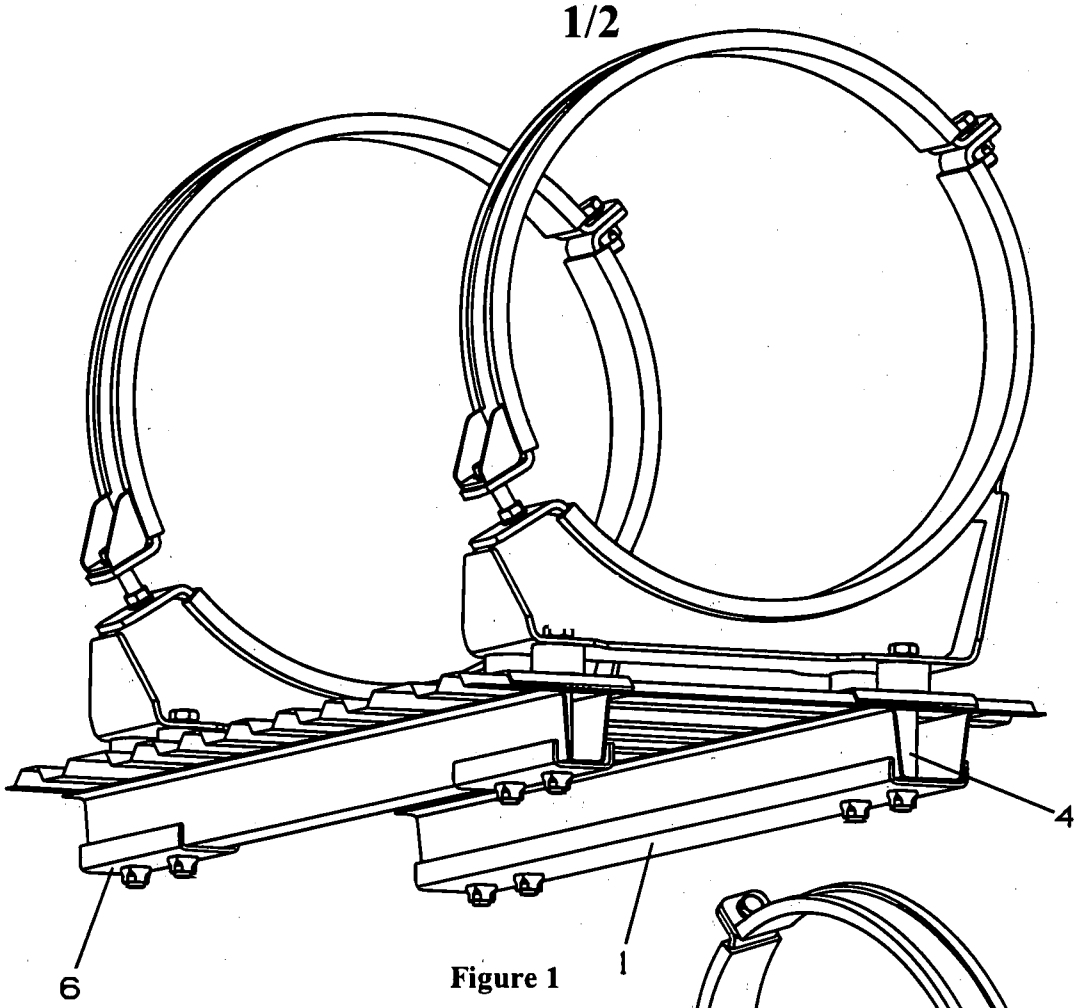


Figure 1

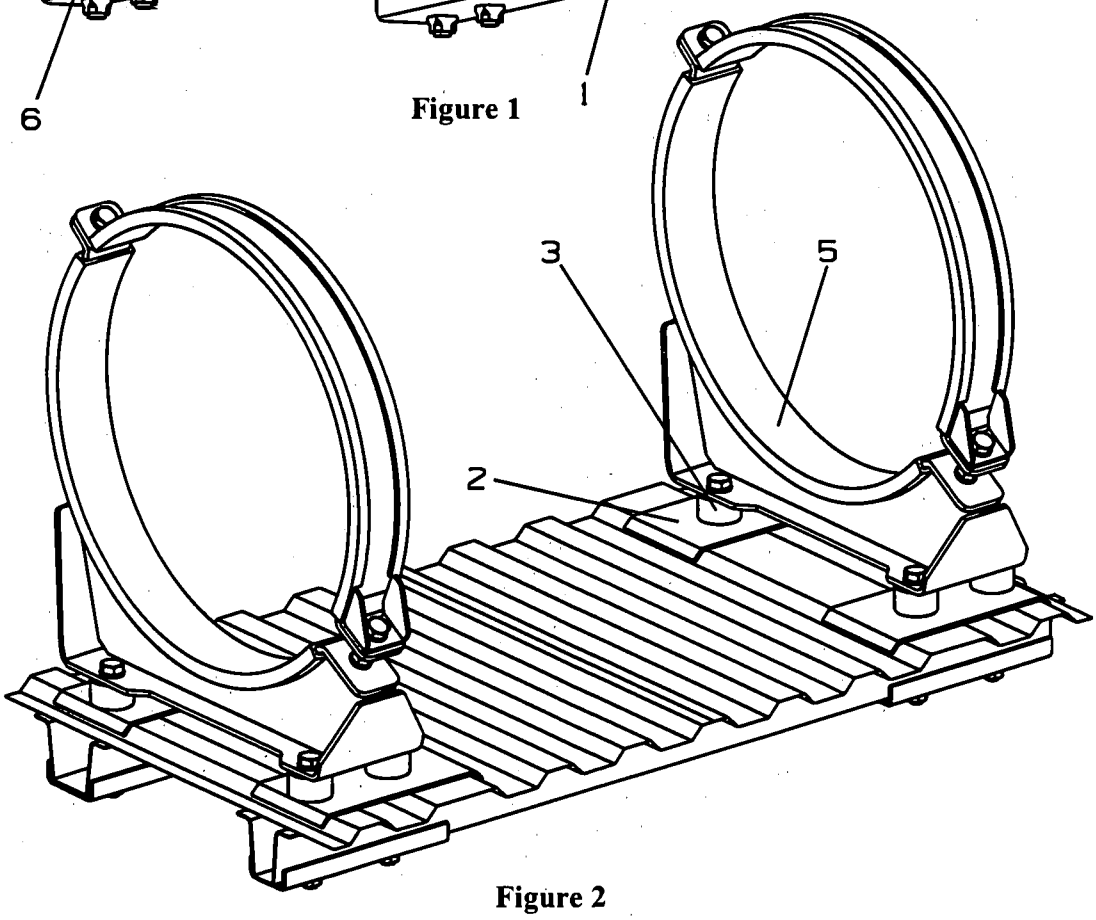


Figure 2

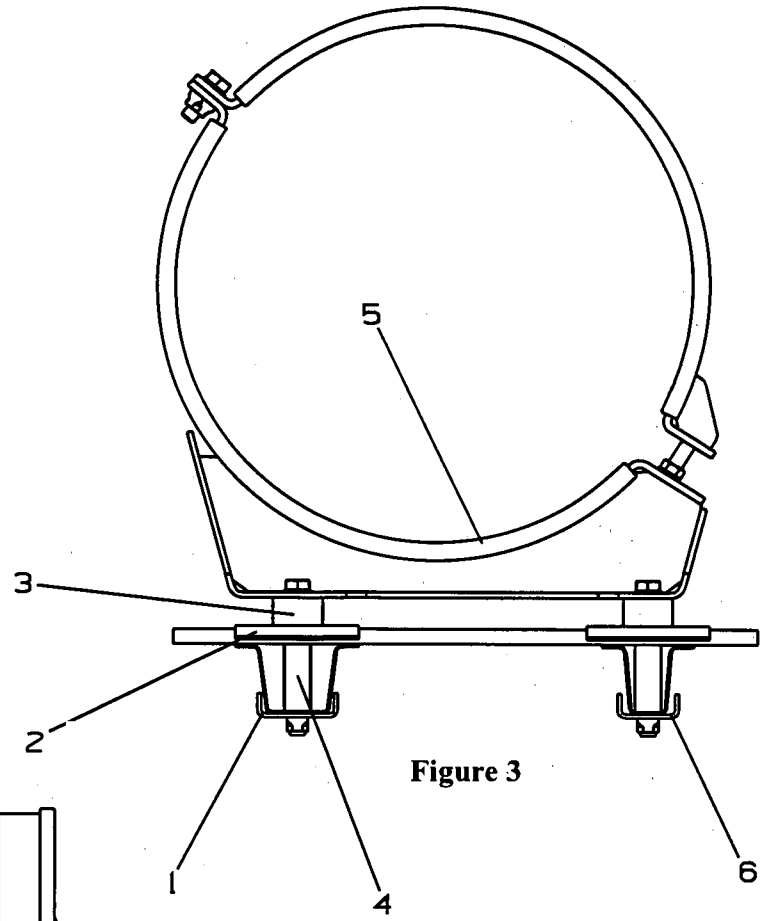


Figure 3

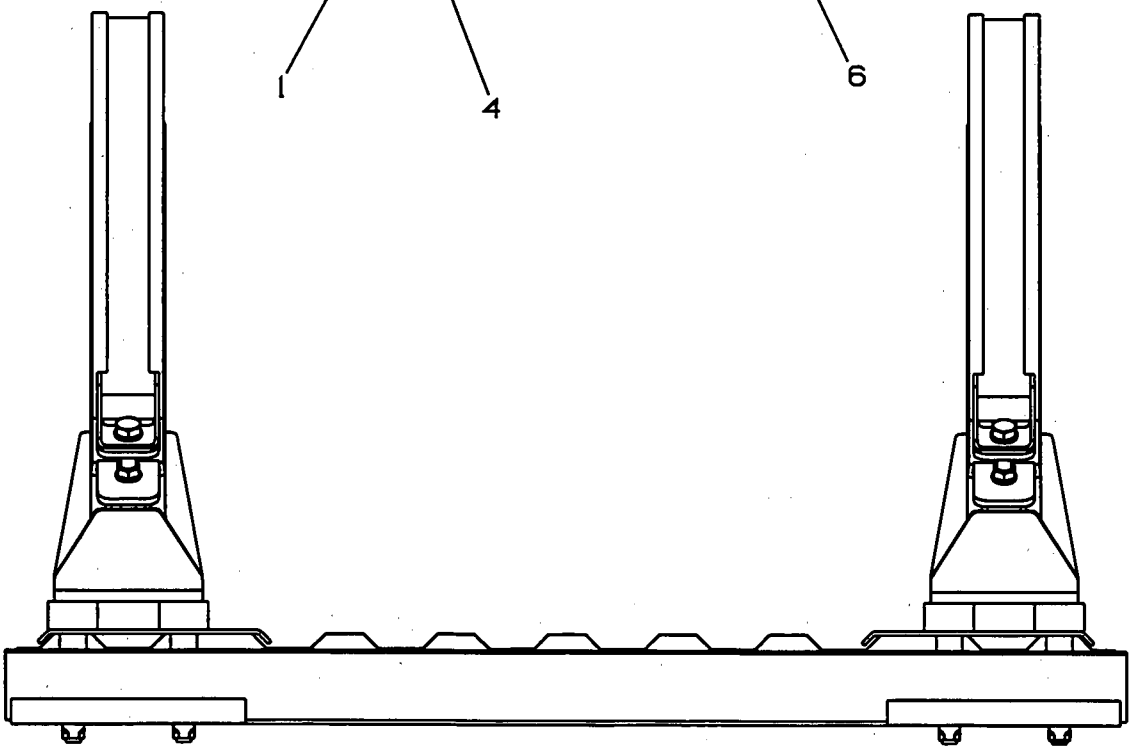


Figure 4

INTERNATIONAL SEARCH REPORT

International application No
PCT/TH2010/000030

A. CLASSIFICATION OF SUBJECT MATTER
INV. F17C13/08
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
F17C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2009/152043 A1 (LEE SANGKYU [KR]) 18 June 2009 (2009-06-18) the whole document	1-3

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
23 November 2010	06/12/2010

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/TH2010/000030

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2009152043 A1	18-06-2009	CN 101468601 A	01-07-2009
		KR 20090064229 A	18-06-2009