Jan. 4, 1966 T. L. BLICKLE 3,226,899

INSULATION PANELS FOR USE IN BOX CARS

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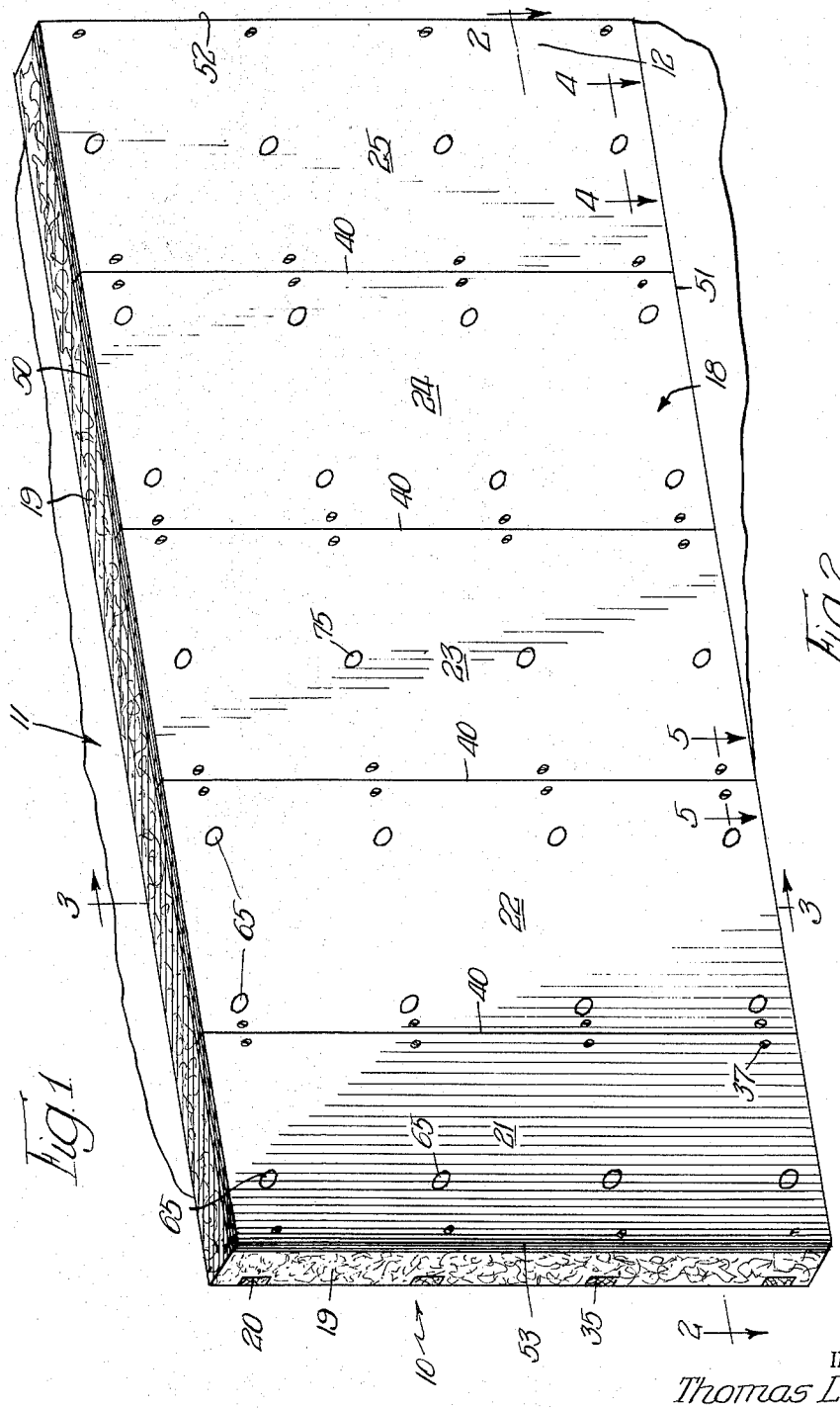


Fig. 1

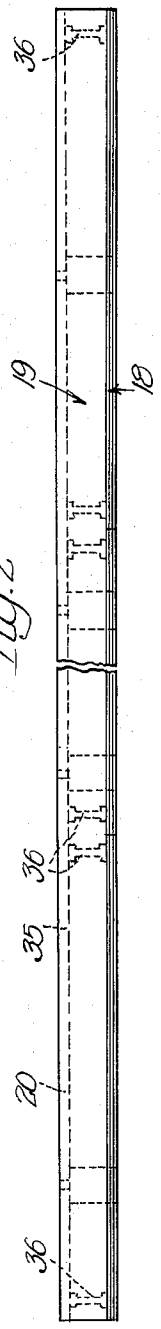


Fig. 2

INVENTOR.
Thomas L. Blickle,
BY
Byron, Hume, Strom & Clement.
Attys.

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Fig. 3

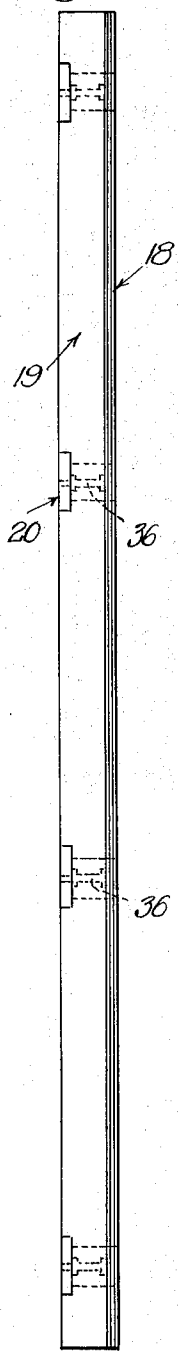



Fig. 4

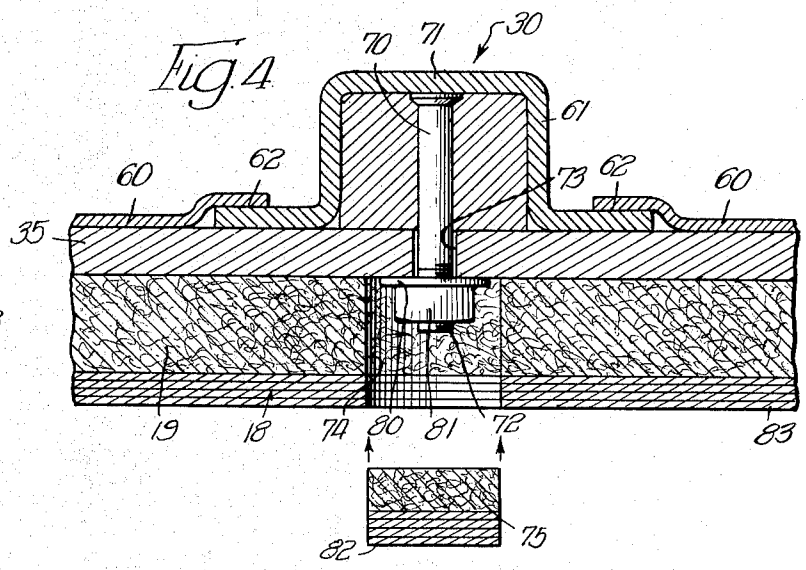



Fig. 5

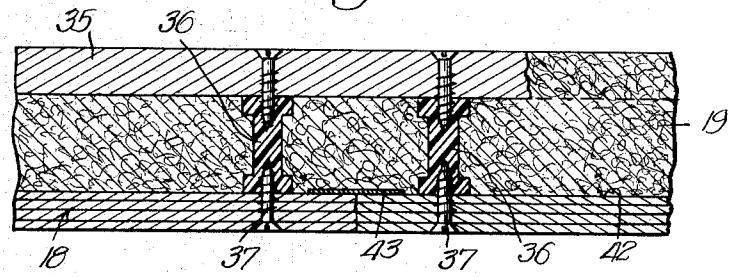
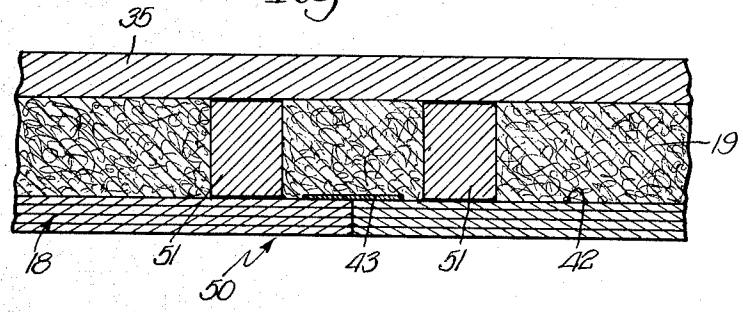



Fig. 6.




INVENTOR.
Thomas L. Blickle,
BY
Byron, Hume, Brown & Clement
attys.

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# INSULATION PANELS FOR USE IN BOX CARS

Thomas L. Blickle, La Grange, Ill., assignor to Landreth Industries, Chicago, Ill., a corporation of Illinois

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4 Claims. (Cl. 52—506)

This invention relates in general to insulation arrangements and more particularly to an improved insulation arrangement for a railway boxcar or the like.

It is common practice to insulate railway boxcars for use as either mechanically temperature controlled car or merely insulated cars. The insulation arrangements utilized have conventionally included insulating materials of well known characteristics, such as mineral wool or the like. Relatively recently, however, foamed plastic materials have become popular as an insulating medium. Foamed plastics such as polyurethane or the like make excellent insulating mediums, as is now well known. They require relatively less space to provide substantially the same amount of insulation as mineral wool, for example, and are relatively easy to work with. The present invention is embodied in a foamed plastic insulation arrangement for a railway boxcar or the like.

It is an object of the present invention to provide an improved foamed plastic insulation arrangement for a railway boxcar or the like.

It is another object to provide an improved foamed plastic insulation arrangement which is simple and relatively inexpensive to construct.

It is yet another object to provide an improved foamed plastic insulation arrangement which assures uniform insulation throughout a railway boxcar.

The above and other objects are realized in accordance with the present invention by providing an improved insulation arrangement which more advantageously utilizes a foamed plastic material as an insulating medium for a railway car. The invention contemplates an arrangement comprised of prefabricated insulating panel units using a foamed plastic insulating medium such as polyurethane or the like. The panel units are secured according to the present invention to the inside walls of a raliway car of broadly conventional construction. Each panel unit is constructed and arranged in such a manner that a uniformly dense insulating layer of foamed plastic is established throughout its extent.

The invention, both as to its organization and method of operation, taken with further objects and advantages thereof, will best be understood by reference to the following description taken in connection with the accompanying drawings, in which:

FIGURE 1 is a front perspective view of an insulating panel unit embodying features of the present invention installed in a boxcar;

FIGURE 2 is an enlarged sectional view of the panel unit taken along line 2—2 of FIGURE 1, with parts removed;

FIGURE 3 is an enlarged sectional view of the panel unit taken along line 3—3 of FIGURE 1;

FIGURE 4 is a further enlarged sectional view of the panel unit taken along line 4—4 of FIGURE 1, with parts removed;

FIGURE 5 is an enlarged sectional view of the panel unit taken along line 5—5 of FIGURE 1, with parts removed; and

FIGURE 6 is an enlarged sectional view, similar to FIGURE 5, of a modified panel unit embodying features of the present invention, with parts removed.

Referring now to the drawings and particularly to FIGURE 1, a portion of an insulation arrangement **10** embodying features of the present invention is mounted inside of and against the side wall **11** of a conventional railway boxcar (not shown in its entirety). The insulation arrangement **10** actually includes a plurality of panel units **12** secured to the inside of the side walls **11**, the end walls (not shown) and the ceiling (not shown) of a railway boxcar according to the present invention, but only one is illustrated. A description of one panel unit **12** suffices to an understanding of the entire invention, however, and the claims are couched in terms of a "wall" whether they apply to side or end walls, ceiling, or even the floor.



As seen in FIGURES 1–3, the panel unit **12** of the insulation arrangement **10** embodying features of the present invention includes a base panel **18** firmly bonded to a two-inch (2″) thick flat block **19** of foamed plastic. The block **19** of plastic is preferably polyurethane or the like which has been foamed in place on the panel **18** and held tightly thereto substantially through the medium of a plurality of furring strip assemblies **20** in a manner which will hereinafter be discussed in more detail.

The base panel **18** comprises a series of substantially identical panel sections **21–25**. The panel sections **21–25** aer preferably three or five-ply, one half (½″) inch plywood sections which are structurally joined together by the foamed plastic block **19** and the furring strip assemblies **20** hereinbefore referred to. The panel unit **12** (together with other substantially identical units **12**) is, in turn, secured to the conventional wall **11** of the railway boxcar (not shown) through the medium of a plurality of mounting stud assemblies **30** (see FIGURE 4) to define the insulation arrangement **10** embodying features of the present invention.

As best seen in FIGURES 2 and 3, the furring strip assemblies **20** extend longitudinally of the base panel **18**, and, correspondingly, transversely of the panel sections **21–25**. Each furring strip assembly **20** preferably includes a strip **35** of wood which is separated from the base panel **18** and joined thereto by a plurality of appropriately placed spacer members **36** connected to both the strips **35** and the base panel by conventional wood screws **37** (see FIGURE 5). Here it will be seen that the spacer members **36** are placed in bracketing relationship with the seams **40** defined between the panel sections **21–25** making up the base panel **18**. Four furring strip assemblies **20** hold the panel sections **21–25** tightly together prior to the application of foamed plastic, preferably polyurethane, to the base panel **18** to form the block **19** of foamed cellular plastic. These assemblies **20** also provide support for the base panel **18** subsequent to formation of block **19**. The use of four assemblies **20** is exemplary, of course, and more or less might be utilized.

The block **19** of foamed cellular plastic is formed in place on the base panel **18** and accordingly surrounds the furring strip assemblies **20**, binding itself to the strips **35** and the spacers **36** of the furring strip assemblies **20**, as well as to corresponding surfaces **42** of the panel sections **21–25**. To seal the panel sections **21–25** together in substantially fluid-tight relationship, prevent seepage of foaming plastic through the seams **40** during the foaming formation, and enhance the physical integrity of the panel unit **12** when it is handled, strips **43** of adhesived fiberglass cloth or the like are secured to the corresponding surfaces **42** of the individual panel sections **21–25** over the seams **40**.

The block **19** of foamed cellular plastic is formed in place on the base panel **18** with the panel **18** lying flat and the furring strip assemblies **20** extending upwardly. Appropriate forms (not shown) are placed against the longitudinally extending edges **46** of the panel **18** and the laterally extending edges **47** thereof to form a shallow mold, the top of which is defined by the upper surfaces **48** of the strips **35** in the furring strip assemblies **20**.

Relatively small portions of the shallow "mold" are successively charged with the appropriate reactants necessary to the formation of foamed polyurethane in a well known manner, while a sheet (not shown) of paper or the like is placed tautly over these small portions of the "mold," supported by the strips **35** on their upper surfaces **48**, and weighted down in any well known manner.

The sheet of paper defines a limit to which the polyurethane can foam upwardly in the shallow "mold" and consequently defines the surface of the block **19** of foamed polyurethane. The block **19** of foamed polyurethane is built up in portions in this manner to assure that a block of substantially constant density, devoid of gas pockets, is established.

Referring now for a moment to FIGURE 6, a modification in construction of the panel unit **12** defining features of the present invention is illustrated. The panel unit **50** is substantially identical to the panel unit **12** with the exception that block spacers **51** glued to corresponding panel sections **21–25** and furring strips **35** are utilized in lieu of the spacer members **36** and wood screws **37**. In all other respects, the panel unit **50** is identical to the panel unit **12** hereinbefore discussed and, accordingly, like components thereof are identified by like reference numerals.

As has previously been pointed out, the panel units **12** (or correspondingly the unit **50**) are secured tightly against the inside of a conventional boxcar wall **11** by stud assemblies **30**, seen in FIGURE 4. The walls **11** conventionally comprise a plurality of vertically disposed wall sections **60** joined to and stiffened by vertically extending channel members **61** by welding or the like, as at **62**. The channel members **61** are conventionally spaced at three-foot intervals longitudinally of the walls **11** although, as can readily be understood, this spacing might be varied.

A series of stud assemblies **30** are mounted in each vertically extending channel member **61** and secure the panel unit tightly against the wall **11**. Each stud assembly **30** includes a stud **70** secured to the base **71** of the channel member **61** by welding or the like, and extending outwardly of the channel member **61** for a distance slightly greater than the thickness of the furring strips **35**. Threaded ends **72** on the studs extend through corresponding apertures **73** formed in corresponding furring strips **35**, into generally cylindrical bores **74** formed in the block **19** of foamed celular plastic and the base panel **18**. These bores **74** are formed in a well known manner by a cylindrical coring tool (not shown) so that the core **75** is saved. The studs **70** may be of the type that can be inserted through the bores **74** and apertures **73** with the panel unit **12** in position against the wall **11**, and automatically welded in place in this relationship. Such an arrangement obviates worries about making studs **70** and apertures **73** coincide. A conventional washer **80** and machine nut **81** are threaded onto the threaded end **72** of each of the studs **70** to draw the panel unit **12** tightly against the boxcar wall **11**.

The core **75**, hereinbefore referred to, is trimmed to a thickness which permits it to be inserted in the bore **74** with its outer surface **82** flush with the outer surface **83** of the base panel **18**, as will be seen. The plugs **75** are preferably glued in their respective bores **74** when the panel unit **12** has been securely attached to the wall **11** of the railway boxcar (not shown).

Although a single panel unit **12** of the insulation arrangement **10** has been shown and described, it should be understood that according to the present invention a series of these panel units are secured to the walls and ceiling of a boxcar in immediately adjacent relationship to establish a complete insulation. In this light, where the construction of the end walls or ceiling of a boxcar varies slightly from that of the wall **11** herein described as by the inclusion of wood stringers, structural timbers or steel carlings, the panel units **12** are modified somewhat and accordingly to include such inserts, without sacrificing features of the present invention.

While several embodiments described herein are at present considered to be preferred, it is understood that various modifications and improvements may be made therein, and it is intended to cover in the appended claims all such modifications and improvements as fall within the true spirit and scope of the invention.

What is desired to be claimed and secured by Letters Patent of the United States is:

**1.** In a closed box car arrangement provided with attachment means on the interior surface of one car wall and an insulation panel unit having a mounting surface at which the panel unit is mounted to the interior surface of the car wall at the attachment means: the improvement of an insulation panel unit comprising;

a base panel,

a plurality of strip members spaced from said base panel with the remote surface of each strip member lying in a common plane,

said strip members being arranged relative to said base panel to overlie the attachment means of the box car,

and cellular plastic insulating material in continuous extension between said base panel and said common plane and bonded to the contacted surfaces of said base panel and strip members,

the surface of each of said strip members and of said cellular plastic material in said common plane defiing the mounting surface of the insulation panel unit,

whereby upon mounting of said insulation panel unit at said strip members to the attachment means of the box car said mounting surface is drawn against the interior surface of the car wall and the cellular plastic insulating material surface portion thereof conforms to the contour of the interior surface.

**2.** The closed box car arrangement set forth in claim **1** wherein the attachment means includes a plurality of stud bolts and corresponding nuts extending normal from the interior surface of the car wall, and wherein the strip members are apertured to receive and overlie said stud bolts and to be drawn to the car wall by threading of the nuts onto the stud bolts.

**3.** In a closed box car arrangement provided with attachment means on the interior surface of one car wall and an insulation panel unit having a mounting surface at which the panel unit is mounted to the interior surface of the car wall at the attachment means: the improvement of an insulation panel unit comprising;

a base panel formed of a plurality of panel sections disposed in abutting relationship at linearly extending free edges,

a plurality of strip members extending transversely of said free edges and spaced from said base panel with the remote surface of each strip member lying in a common plane,

spacer means connecting said strip members to said panel sections to overlie the attachment means of the box car,

and cellular plastic insulating material in continuous extension between said base panel and said common plane and bonded to the contacted surfaces of said base panel and strip members,

the surface of each of said strip members and of said cellular plastic material in said common plane defining the mounting surface of the insulation panel unit,

whereby upon mounting of said insulation panel unit at said strip members to the attachment means of the box car said mounting surface is drawn against the interior surface of the car wall and the cellular plastic insulating material surface portion thereof conforms to the contour of the interior surface.

**4.** In a closed box car arrangement provided with a

plurality of stud bolt and nut attachment means extending normal from the interior surface of the car wall, and an insulation panel unit having a mounting surface at which the panel unit is mounted to the interior surface of the car wall by the stud bolt and nut attachment means: the improvement of an insulation panel unit comprising;

a base panel defining an outer face and formed of a plurality of panel sections disposed in abutting relationship at linearly extending free edges,

a plurality of strip members extending transversely of said free edges and spaced from said base panel with the remote surface of each strip member lying in a common plane,

spacer means connecting said strip members to said panel sections to overlie the attachment means of the box car,

and cellular plastic insulating material in continuous extension between said base panel and said common plane and bonded to the contacted surfaces of said base panel and strip members,

the surface of each of said strip members and of said cellular plastic material in said common plane defining the mounting surface of the insulation panel unit,

said strip members being apertured to receive corresponding stud bolts and said base panel and cellular plastic insulating material including a plurality of corresponding bores and plugs in alignment with said apertures to provide access to the stud bolts at the apertures and to receive the corresponding nuts,

whereby upon mounting of said insulation panel unit to the interior surface of the car wall to said studs are in extension through the apertures in the strip members, and the panel unit is secured to the car wall by tightening of the nuts on the studs against the strip members through the access provided at the corresponding bores and plugs, so that the mounting surface is drawn against the interior surface of the car wall and the cellular plastic insulating material surface portion thereof conforms to the contour of the interior surface of the car wall.




**References Cited by the Examiner**

UNITED STATES PATENTS

| | | | |
|---|---|---|---|
| 2,247,886 | 7/1941 | McLaughlin | 52—578 |
| 2,376,653 | 5/1945 | Boyer | 52—615 XR |
| 2,642,818 | 6/1953 | Talmey | 52—481 |
| 2,730,772 | 1/1956 | Jones | 52—272 |
| 2,858,580 | 11/1958 | Thompson et al. | 296—31 |
| 2,866,730 | 12/1958 | Potchen et al. | 52—309 XR |
| 2,896,271 | 7/1959 | Kloote et al. | 52—63 |
| 3,014,611 | 12/1961 | Marshall | 52—262 |
| 3,026,577 | 3/1962 | Dosker | 52—506 |

FOREIGN PATENTS

| | | |
|---|---|---|
| 558,242 | 6/1958 | Canada. |
| 810,077 | 8/1951 | Germany. |
| 699,667 | 11/1953 | Great Britain. |
| 772,181 | 4/1957 | Great Britain. |



FRANK L. ABBOTT, *Primary Examiner.*

EARL J. WITMER, JACOB L. NACKENOFF, *Examiners.*