

Feb. 18, 1969

J. L. BACHRICH
INSULATED STRUCTURAL BARRIER

3,427,775

Filed Dec. 6, 1966

Sheet 1 of 3

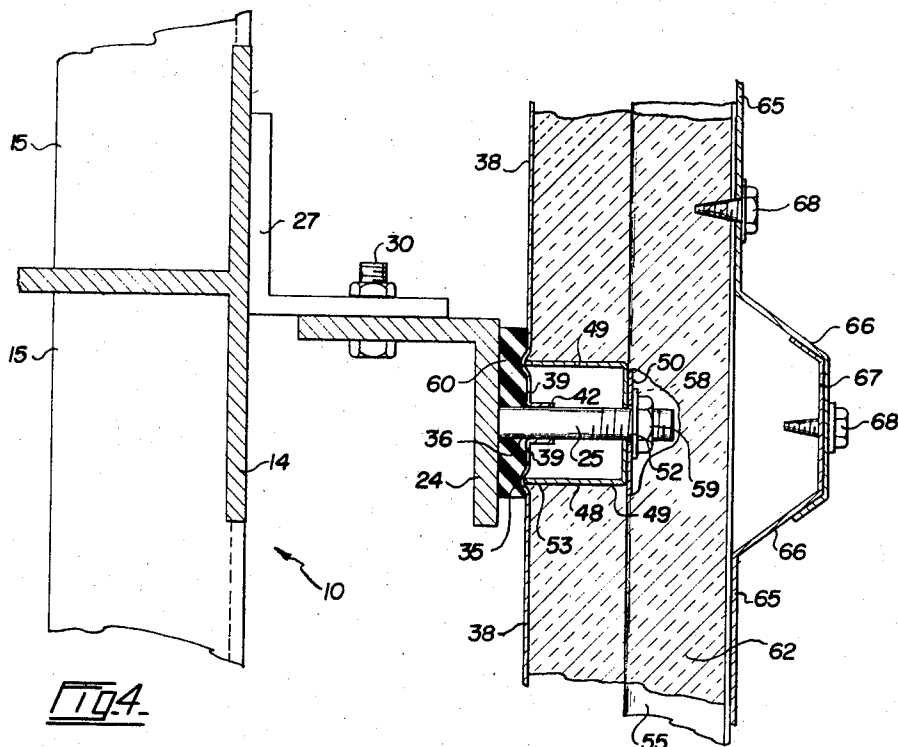


Fig. 4.

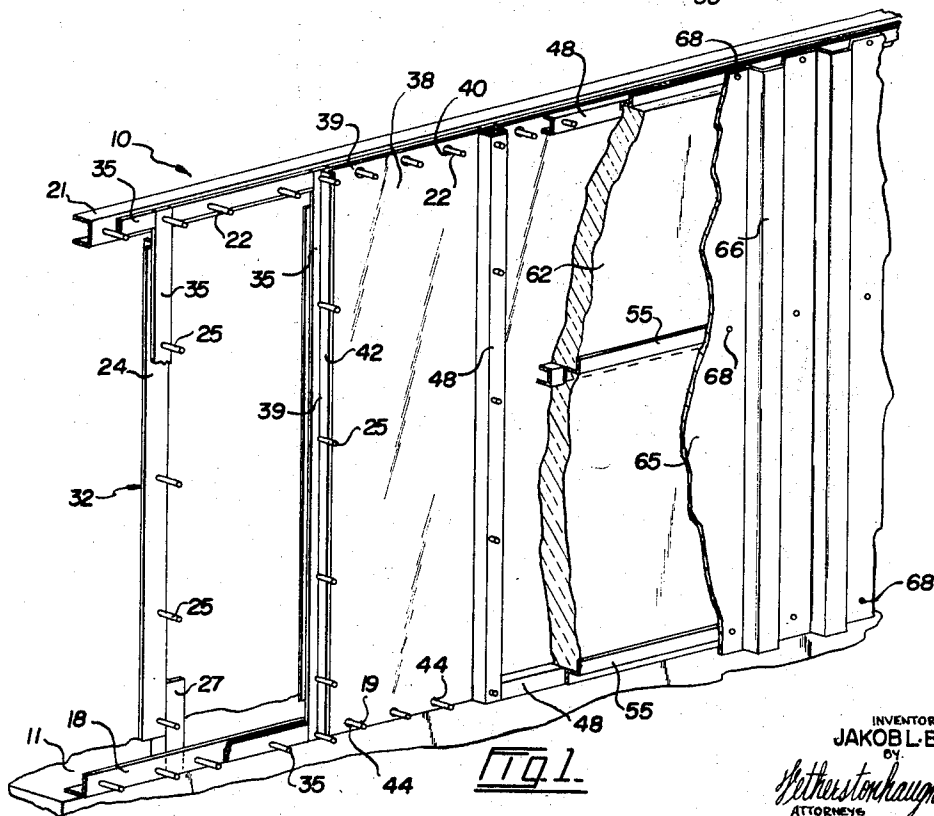


Fig. 1.

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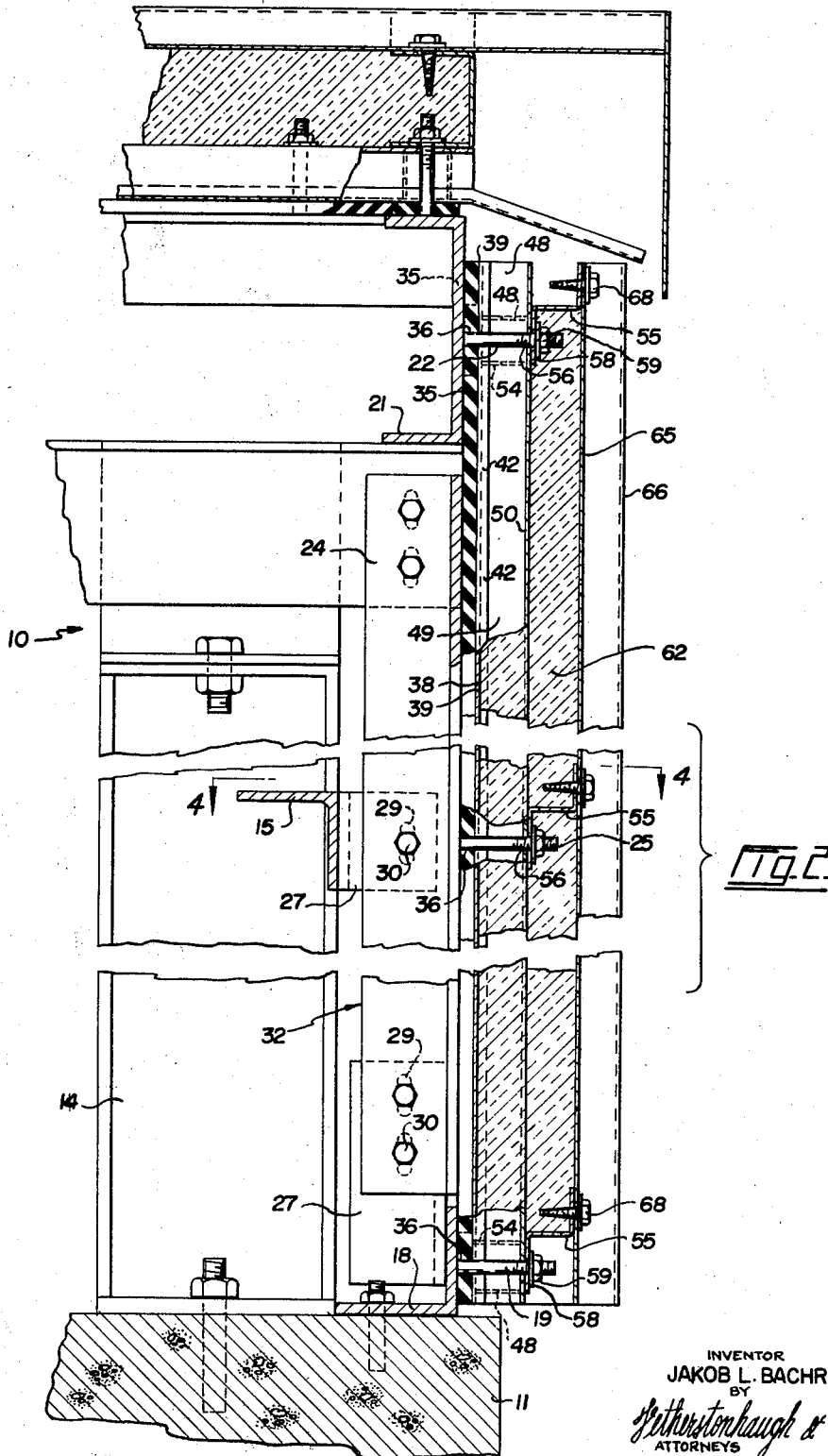
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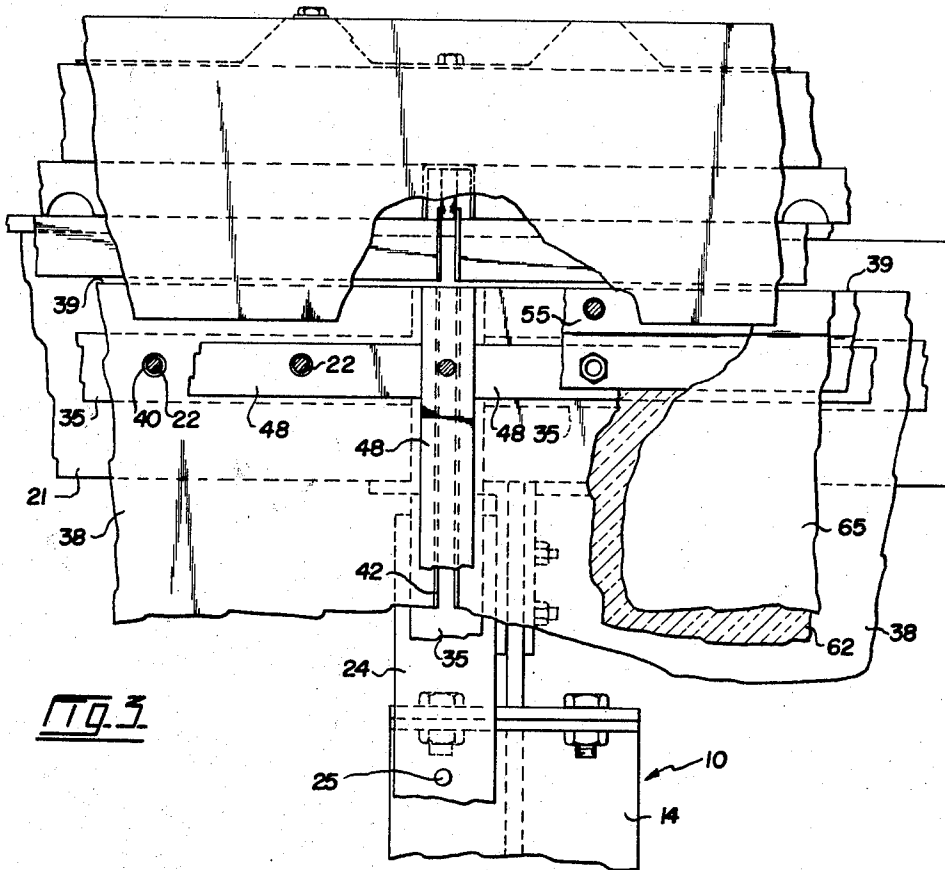


Fig. 3

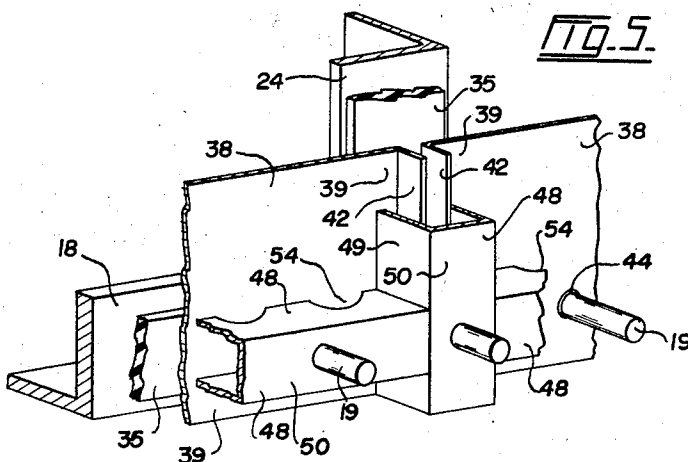


Fig. 5

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INSULATED STRUCTURAL BARRIER

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ABSTRACT OF THE DISCLOSURE

Construction for the walls and roof of a prefabricated dry kiln and including supports providing a series of adjoining rectangular frames. Inner wall panels clamped into sealing engagement with the supports to close the frames. Outer wall panels supported in spaced relation to the inner wall panels to define therewith a drained and ventilated air space. Insulating material interposed between the inner and outer wall panels.

Background of the invention

The design of a building in which lumber is to be dried and cured presents a number of distinct problems, particularly when the structure is prefabricated. Because of the heat and the humidity which will be present in the interior of the kiln when in use, the roof and walls should be vapor and water proof. In order to keep the heat loss within reasonable limits the building must be heavily insulated and, of course, the exterior surfaces are required to be sufficiently weather proof to safeguard the insulation as well as other parts of the structure. And finally, provision must be made to drain away the large amounts of condensate which tends to gather in any building where there is a large temperature differential between the interior and exterior surfaces.

The objects of the present invention are to provide a type of construction which will fulfill all the above mentioned requirements of a dry kiln and to do so in such a way that the structure can readily be prefabricated at the factory for quick and easy assembly later at a selected building site.

Summary of the invention

The present wall construction therefore includes support members which can be attached to any building framework. These members are arranged to provide rectangular frames of a predetermined size. Prefabricated panels are used as closures for the open frames and means are provided whereby the edges of the panels can be tightly clamped into sealing engagement with the support members. The construction also includes outer wall panels which are supported in spaced relation to the inner wall panels and out of contact with any metal part of the support members. Means are provided to support a layer of insulation between the inner and outer wall panels and other means associated with the outer wall panels ensure ventilation of the interspace between the interior and exterior panels.

Brief description of the drawings

In the drawings which illustrate the preferred embodiment of the invention,

FIGURE 1 is a perspective view of a portion of the wall construction with parts broken away,

FIGURE 2 is a fragmentary vertical section, part in side elevation,

FIGURE 3 is an elevation of the exterior of the wall construction with parts broken away,

FIGURE 4 is an enlarged section taken on the line 4-4 of FIGURE 2, and

FIGURE 5 is a perspective view of the lower end of a vertical support and parts associated therewith.

Description of the preferred embodiment

In the drawings, the numeral 10 generally indicates a steel framework for a dry kiln or the like. A concrete base 11 supports the conventionally constructed framework 10 and included in this structure are suitable spaced columns 14 which are connected at approximately mid-height by horizontal girts 15.

The present invention provides means for covering or closing in the framework 10 and for the sake of brevity, one side wall only will be referred to in the following description. However, it will be understood that the same construction with only slight modification, can be employed to form a closure for the end walls and also the roof of the building.

The numeral 18 indicates a support formed of an angle which is secured to the foundation 11 of the building to extend from corner to corner of the side wall. Secured to the vertical flange of the angle support 18 is a row of horizontally disposed stud bolts 19. The bolts 19 project outwardly from their supporting flange and are spaced apart at suitable intervals.

A length of channel is carried by the framework 10 above the columns 14 and this channel provides a second horizontal support 21 extending the full length of the kiln. Bolts 22 similarly project from the outer face of the channel support 21.

Extending between the supports 18 and 21 are a number of vertical supports 24 constructed of lengths of angle. The supports 24 are spaced apart at regular intervals and are provided, along their entire length, with a row of bolts 25. To secure the supports 24 to the framework 10, the girts 15 and also the foundation support 18, are fitted with brackets 27, see particularly FIGURE 2. One flange of the angle supports 24 have contact with the brackets 27 and vertical slots 29 are formed in the contacted bracket part. Bolts 30 extend through the supports 24 and slots 29 to clamp the supports to the brackets and provide for slight vertical adjustment of said supports.

The horizontal supports 18 and 21 together with the vertical supports 24, provide the side of the building with a number of wall frames 32, see FIGURE 1. These open and rectangular wall frames extend from the foundation of the building to the eaves and are of a standard size to allow their attached parts to be prefabricated to known dimensions.

The supports 18, 21 and 24 making up one wall frame 32 are faced with gaskets 35. These gaskets are formed of strips of rubber-like material which have openings 36 to receive the stud bolts 19, 22 and 25. The supports 18, 21 and 24 are individually fitted with the gaskets 35, the gaskets being slipped over the bolts and into abutment with the outer surfaces of said supports. Thus, the gaskets are supported in the required position during assembly of the remaining wall parts.

An inner panel 38 is fitted to each open frame 32. The inner panels preferably are rectangular aluminum sheets having marginal edges 39. Along the top marginal edge 39 of the panels, a row of openings 40 is formed, see FIG-

URES 1 and 3, and the bolts 22 on the support 21 project through these openings. The edges 39 on the sides of the panels 38 are provided with outwardly directed flanges 42. As shown best in FIGURE 4, the side edges 39 of adjacent panels overlap the gaskets 35 and also the supports 24 with the flanges 42 engaging opposite sides of the bolts 25. The bottom marginal edge 39 of the panels may be flanged in the same manner as the side edges but preferably this lowermost edge has a row of openings 44 to receive the bolts 19, see particularly FIGURE 5.

The supports 18, 21 and 24 of a frame 32 are fitted with U-shaped clamping bars 48. Suitably, the bars 48 are lengths of steel channel having side flanges 49 and webs 50. FIGURE 4 shows a typical bar 48 which in this instance is mounted on the support 24 and it will be seen that the web 50 has a row of openings 52 through which the bolts 25 project. The flanges 49 straddle the flanges 42 on the side marginal edges 39 of two adjacent inner wall panels 38, thus locking the panels together. It will be noted, the inner edges of the flanges 49, which form presser edges 53, engage the panel along its entire length. The clamping bars 48 at the top and bottom of each frame 32 do not, of course, bridge adjacent panels (FIGURES 3 and 5), but simply about the adjoining marginal edges of the panels and extend between the vertically disposed clamping bars on the sides of that particular frame. Both flanges 49 of the bars 48 along the bottom edge of the wall are provided with semi-circular cut outs 54, see FIGURES 2 and 5. These cut outs are spaced along the length of the clamping bars 48 to allow moisture to drain off the outer faces of the panels 38 and to permit air to circulate through the space framed by said clamping bars.

The frames 32 are fitted with brackets 55 which are formed of lengths of double reversed angle material, the brackets being vertically spaced apart on the frames and extending from end to end of the wall. FIGURE 2 shows that the brackets 55 are mounted on some of the bolts 19, 22 and 25 with the inner flange of said bracket having suitable openings 56 through which the bolts project.

A lock washer 58 and finally a nut 59 are fitted to each stud bolt 19. The nuts 59 are tightened to lock the above-mentioned parts together as a unit and form a sealed closure for each frame 32. As the nuts are tightened, the presser edges 53 of the steel bars 48 are forced a short distance into the relatively soft aluminum of the wall panels. The edges 39 of the wall panels bear against the soft rubber-like gaskets 35 and said gaskets in turn are backed by the unyielding hard metal frame supports. Thus, the marginal edges 39 of the panels are crimped as shown at 60 in FIGURE 4, and the gaskets 35 are unevenly compressed to improve the seal around the panels.

The frames 32, when closed and sealed in the above described manner, are covered with a layer of insulation 62. This insulation may be any suitable semi-rigid material made up in large sheets or slabs. The insulation slabs are applied to the exterior faces of the panels 38 and are supported by the brackets 55 with no additional fasteners being required. As shown best in FIGURE 4, the insulation 62 covers the outer ends of the several bolts as well as the clamping bars 48.

The entire side wall of the building is covered with sheeting made up of aluminum panels 65. The outer wall panels 65 are corrugated, viz they have vertically extending channels 66 which are regularly spaced apart from one side edge of the panel to the other. These channels are open at the top and bottom of the side wall and some of said channels are arranged to register with the bolts on the frame supports. The side edges of the outer wall panels are suitably overlapped and sealed as shown at 67 in FIGURE 4, and self tapping screws 68 secure the panels 65 to the brackets 55.

It will be noted that only the gaskets 35 and the marginal edges 39 of the inner wall panels are subjected to

clamping pressure when the nuts 59 are tightened on the stud bolts. The insulation 62 is not compressed and its thickness and insulating properties remain the same during the life of the building. In addition, the outer panels 65 are free from compressive forces which might tend to damage the material or impair the ventilating action of the channels.

Thus, one side wall of the framework 10 is closed in and sealed. The channels 66 on the outer panels 65 are open to atmosphere near the foundation 11 and also below the eaves of the building. Air can then circulate through these channels to ventilate the space in which the insulation 62 is carried. By sealing, insulating and also ventilating the wall construction in this manner, the heat loss from the kiln is kept at a desirably low level and the small amount of condensation which might occur within the wall is rapidly dissipated by the circulation of outside air through the wall.

As previously stated, substantially the same construction will serve equally as well for the end walls of the building. Door and window openings are easily provided by slight alteration of the design. The roof of the dry kiln is similarly constructed except for the obvious allowance for a suitable pitch and other minor alterations and additions such as the use of flashing and the like.

I claim:

1. Wall construction comprising upper and lower horizontal supports, a plurality of spaced vertical supports extending between and connected to the upper and lower supports, said upper, lower and vertical supports forming a plurality of frames in the wall construction, sealing strips on faces of the supports, an inner wall panel over each frame and bearing against the sealing strips of the supports on said each frame, side edges of each inner panel being positioned near side edges of the inner panels of adjacent frames, a clamping bar over each vertical support, each clamping bar being U-shaped in cross section and having side flanges bearing against the side edges of the inner panels of adjacent frames, bolts secured to each vertical support and extending through the clamping bar thereon, nut means on the bolts for tightening the clamping bar side flanges against the side edges of the inner panels and pressing said side edges against the sealing strips, brackets on some of the bolts intermediate said upper and lower supports and extending between adjacent vertical supports, said brackets being retained on said bolts by nut means, said brackets including flanges projecting outwardly from the bolts and away from the clamping bars, outer panels secured to the brackets in spaced relation to the inner panels, a layer of insulating material between the inner and outer panels, said insulating material covering the clamping bars, bolts and nut means and being protected against compression by the brackets.

2. Wall construction as claimed in claim 1, in which said side edges of the inner panels have crimps formed by the side flanges of the clamping bars and outwardly directed flanges enclosed by said clamping bars.

3. Wall construction as claimed in claim 1, and including bolts on the upper and lower horizontal supports, said inner panels having top and bottom edges through which the bolts of the upper and lower horizontal supports extend, a horizontal clamping bar on each upper and lower horizontal support engaging the top and bottom edges of the inner panels, and nut means on the bolts of the upper and lower horizontal supports for tightening the clamping bars and pressing top and bottom edges of the inner panels into sealing engagement with the sealing strips.

4. Wall construction as claimed in claim 3, in which said clamping bar of each lower horizontal member has a drain opening communicating with the outer surface of an adjacent inner panel.

5. Wall construction as claimed in claim 4, in which said outer panels are vertically corrugated to provide

ventilating channels open to atmosphere at the top and bottom ends thereof.

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