Nov. 12, 1940. V. C. KLINE 2,220,999

INSULATED STRUCTURE

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Fig. 1.

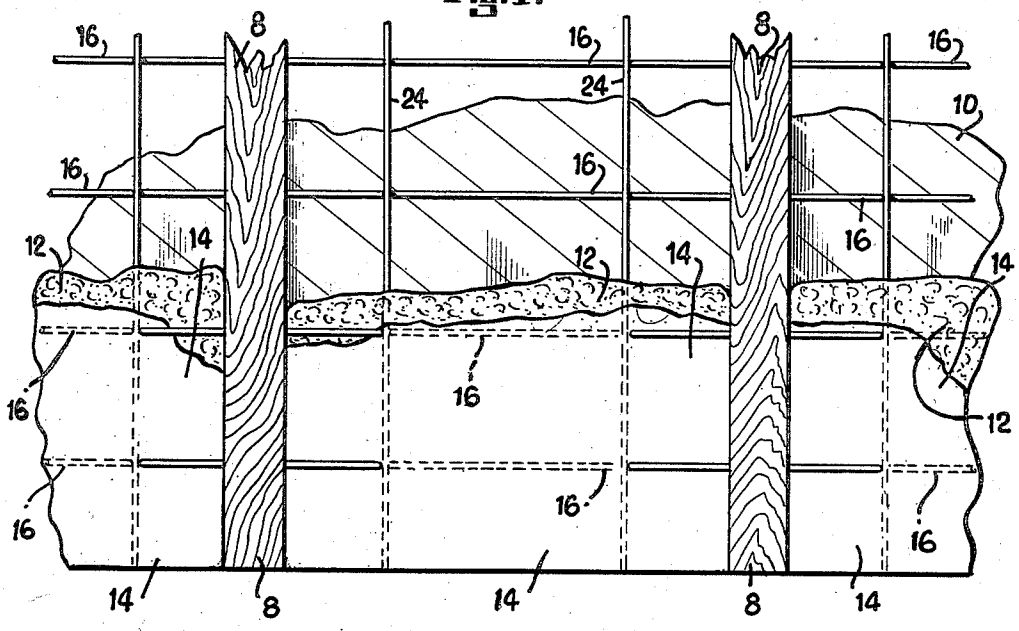


Fig. 2.

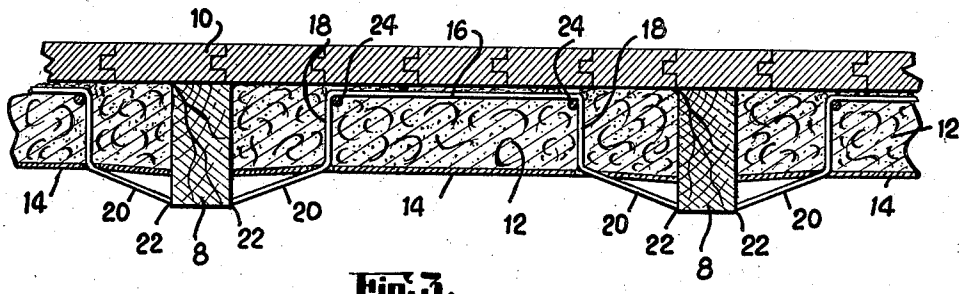
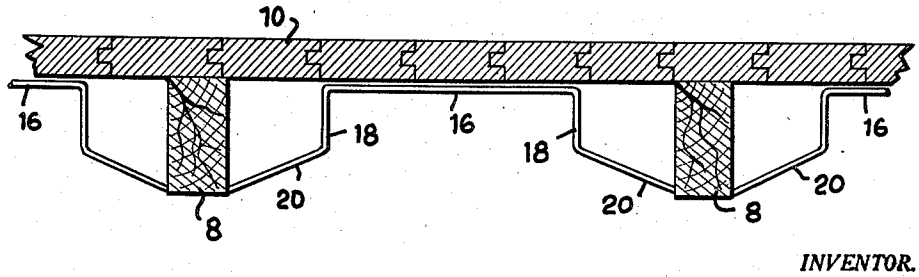


Fig. 3.



INVENTOR.

Virgil C. Kline

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Fig. 4.

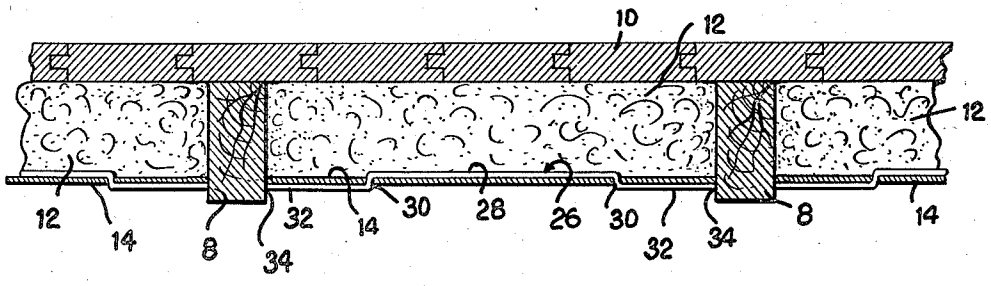


Fig. 5.

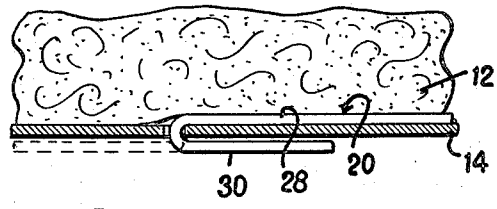
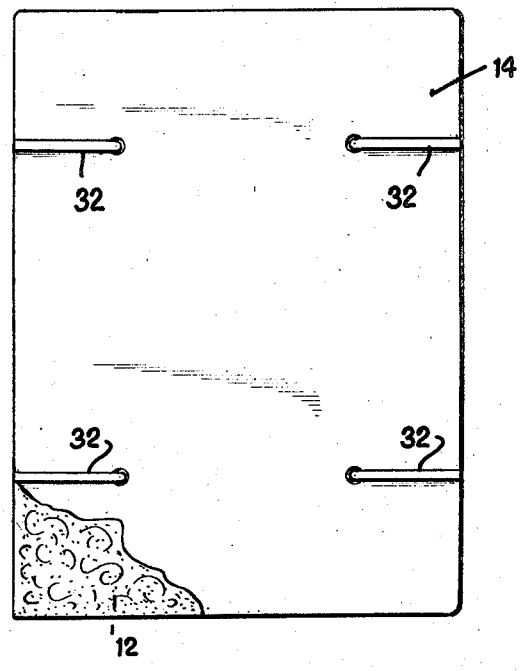


Fig. 6.



INVENTOR.

Virgil C. Kline

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UNITED STATES PATENT OFFICE

2,220,999

INSULATED STRUCTURE

Virgil C. Kline, Scarsdale, N. Y., assignor to Johns-Manville Corporation, New York, N. Y., a corporation of New York

Application October 23, 1937, Serial No. 170,559

7 Claims. (Cl. 20—4)

The present invention relates to insulated structures, and more particularly, it relates to building or other structures having insulating material in the walls thereof, and devices for supporting and maintaining the insulating material in proper position within the walls.

It is an object of this invention to provide a device for supporting and maintaining insulating material, such as mineral wool, in position between frame members of a structure, such as studs, joists, and rafters. Such insulating material can be made sufficiently rigid to be self-supporting when installed, but when unusually light materials are used or when the material is in the form of nodules it is frequently desirable to support the material in position to prevent any possibility of its sagging or settling and thereby disrupting the insulating layer or area. Also, when it is desired to provide an unusually rigid structure, some additional supporting means may be required even when the insulating material is such as to be self-supporting.

It is a further object of this invention to provide a supporting device for insulating material which is itself self-supporting and requires no additional fastening device. The supporting device of the present invention is also capable of being economically manufactured, installed rapidly and in a number of different ways to meet the various exigencies frequently encountered during the application of insulation to building frames or the walls or frames of other structures.

It is a further object of the present invention to provide an insulating unit which has associated therewith a means for permanently supporting it in position within a structure frame.

Other objects and advantages of the invention, if not specifically pointed out, will be apparent to those skilled in the art from the following detailed descriptions of what are now considered to be the preferred embodiments of the invention.

In the drawings:

Fig. 1 is a fragmentary elevational view of a building structure frame which is provided with insulating material and supports for the material which are made in accordance with the present invention;

Fig. 2 is a top plan view of the structure frame illustrated in Fig. 1;

Fig. 3 is a top plan view of a structure provided with an insulating material support which comprises a modification of the support illustrated in Figs. 1 and 2;

Fig. 4 is a top plan view of a structure frame provided with an insulating unit made in accordance with the present invention;

Fig. 5 is a fragmentary top view of the insulating unit illustrated in Fig. 4; and

Fig. 6 is an elevational view of the insulating unit illustrated in Fig. 4, showing elements partly broken away for the sake of clearness of description.

Referring to the drawings, Fig. 1 discloses a building structure frame comprising spaced supporting members 8, such as the usual studs employed in the construction of houses. The studs 8 support the exterior wall which is usually formed of sheathing 10 and some suitable exterior covering (not shown). Insulating material 12, which may be mineral wool batts, nodulated mineral wool, wood fibres, and other well-known types of insulating material, is disposed between the studs 8. The insulating material 12 takes the form of sheets which extend substantially continuously from the bottoms to the tops of studs 8, either in one continuous length or several lengths placed end to end. Such insulating material is frequently provided on one face with a sheet of fabric or paper material 14 for the purpose of mechanically protecting the insulating material during transportation and installation and giving lateral support to the insulating material after it is installed. The fabric 14 may be omitted if such mechanical protection and lateral support are not required.

Substantially U-shaped rod-like members 16 are positioned with the legs or sections 18 which form the U projecting laterally through the sheets of insulating material 12 from face to face, and the legs 18 are turned outwardly to form additional sections 20 which extend along the adjacent faces of the insulating sheets and are wedged into contact with the studs 8 at points 22. The ends of the sections 20 grip the studs 8 at points 22 and thus support the insulating sheets 12 in position between the studs 8.

The supporting members 16 may be connected together by vertically extending members 24 which may be welded or otherwise suitably secured to the members 16. The members 16 and 24 will usually be fabricated at the factory and the reticulated articles so formed will be suitably packaged for shipment to the point of installation. At the point of installation, the reticulated article can be cut into the proper lengths to extend substantially from the tops to the bottoms of the studs by workmen with ordinary wire cutting pliers. The insulating material 16 will then be pressed over the legs 18 and the sections 20 turned

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outwardly. The sheet of insulating material 12 with the reticulated article so attached will then be inserted between a pair of studs 8 and the sections 20 wedged between the stud members. If desired, the reticulated articles may be applied to lengths of insulating sheets 12 at the factory and the insulating sheets with the reticulated article attached may be sold and installed as a unit. The connecting members 24 may be omitted if desired, as shown in Fig. 3, and the U-shaped members 16 may be applied to the insulating material at the point of installation.

In the form of the invention disclosed in Figs. 4 to 6, the paper 14 is adhered to the sheet of insulating material 12 by any suitable adhesive (not shown), and each supporting member 26 has a portion 28 which extends between the paper 14 and the insulating material sheet 12, portions 30 which are bent outwardly and passed through the sheet 14, and portions 32 which are bent in opposite directions and are wedged into contact with the studs 8 at points 34. The supporting members 26 will usually be attached to the insulating sheets 12 at the factory and the sections 32 may be bent toward one another, as shown in Fig. 6, during transportation of the insulating unit. When the insulating unit is to be installed in a structure frame, the sections 32 will be bent in opposite directions and wedged between adjacent studs 8 as described above.

It will be seen that the present invention provides a simple and economical support for insulating materials, which support can be combined with insulating material to form a compact and cheap insulating unit which can be installed with equal facility in vertical, horizontal, or inclined walls, or other spaces which it is desired to insulate. The insulating material support can be installed substantially at the same time as the insulating material itself and by the same workmen, and thereby reduce installation expenses. Furthermore, the support effectively holds the insulating material in position at all times without affecting the insulating qualities of the material.

The invention has been disclosed in connection with a building structure merely for the purpose of explanation, and it is to be understood that it can be used equally well with other structures, such as cars, boats, etc.

The foregoing details have been given for the purpose of explanation and not limitation, since many changes and modifications may be made in the disclosed embodiments without departing from the scope of the invention.

The invention having been described, what is claimed is:

1. A structure comprising spaced supporting members, units of insulating material disposed between adjacent supporting members, and substantially U-shaped members, each having the legs forming the U extending through an insulating unit and turned outwardly and wedged into contact with the adjacent supporting members to retain the said insulating unit in position.

2. An insulating unit for use in a structure having spaced supporting members, comprising a body of insulating material, and a resilient, substantially U-shaped member having the legs forming the U extending through the body of insulating material and turned outwardly in position to be wedged between adjacent supporting members.

3. A device for retaining insulating material in position in a structure having spaced supporting members, comprising substantially U-shaped members, each having the legs forming the U positioned to extend through the insulating material and turned outwardly and of such length as to wedgingly engage between adjacent frame members, and connecting elements extending between successive U-shaped members.

4. A structure comprising spaced supporting members, bodies of insulating material disposed between adjacent supporting members, and insulation securing elements, each of said securing elements including a substantially U-shaped portion embracing a part of an insulating body, the legs of said U-shaped portion including parts extending across marginal portions of a face of the insulating material into wedging contact with adjacent of said supporting members.

5. An insulating unit for use in a structure having spaced supporting members, said unit comprising an insulating body and insulation securing elements, each of said elements including a substantially U-shaped portion embracing a part of the insulating body, the legs of said U-shaped portion including parts extending across marginal portions of a face of the body and with their ends in position to be wedged between adjacent of said spaced supporting members.

6. An insulating unit for use in a structure having spaced supporting members, said unit comprising an insulating body and insulation securing elements, each of said elements comprising a resilient, rod-like member penetrating a part of the body and having end portions overlying a face of the body and in a position to be wedged between adjacent of said supporting members.

7. An insulating unit for use in a structure having spaced supporting members, said unit comprising a body of insulating material including a facing sheet secured to one face thereof and insulation securing elements, each of said elements comprising a rod-like member having a portion extending beneath said facing sheet and end portions overlying said facing sheet and arranged for wedging engagement with adjacent of said supporting members.

VIRGIL C. KLINE.

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