Aug. 11, 1931. O. F. MOTTWEILER ET AL 1,818,345

INSULATING STRUCTURE

Filed Nov. 25, 1927

Fig. 1.

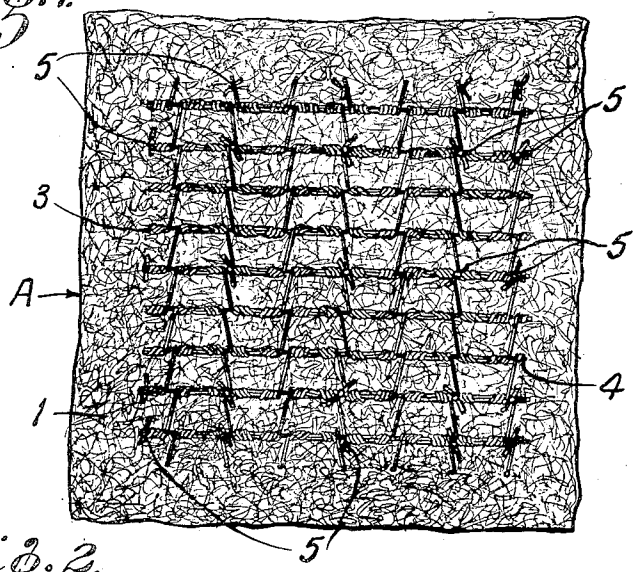


Fig. 2.

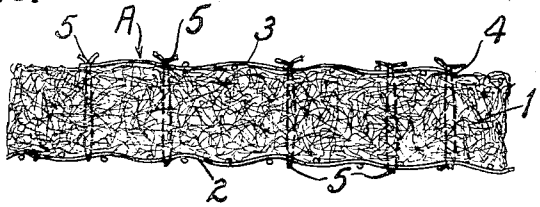
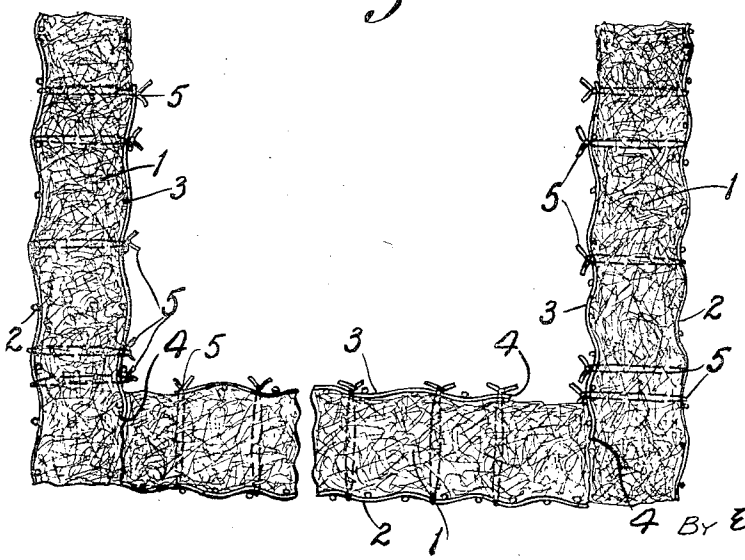


Fig. 3.



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UNITED STATES PATENT OFFICE

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INSULATING STRUCTURE

Application filed November 25, 1927. Serial No. 235,553.

This invention relates generally to insulating structures, and particularly to an improved insulating structure adapted for use in a flat condition in connection with walls of refrigerators, rooms, and other structures where insulation is desired, the predominant object of the invention being to produce an insulating structure in blanket form which will function in an extremely efficient manner when in use to greatly interfere with the exchange of heat and sound through walls with which insulating units made in accordance with our invention are associated.

Another important object of our invention is to so construct an insulating unit that a plurality of said units may be employed to produce an angular corner without the metallic elements of said units producing conductors along which exchange of heat may take place from one surface of the insulating wall produced by said insulating units to the opposite surface thereof.

Still another object of the invention is to produce an insulating structure from material which is treated to render same waterproof and to give to said material sufficient stiffness and body so that same will not settle or sag when in use in a manner to cause said material to be drawn away from its proper position without the wall or other structure which is being insulated.

Figure 1 is a plan view of one of our improved insulating units;

Figure 2 is a section taken through the unit shown in Fig. 1;

Figure 3 is a view illustrating the manner in which a plurality of our improved insulating units may be employed to produce an insulating wall having corners.

In the drawings, which illustrate one embodiment of our invention, A designates one of our improved insulating units, which comprises a body portion 1 formed of rock wool or similar insulating material. The body portion 1 is preferably rectangular in plan and may be of any desired dimensions with respect to length, breadth and thickness, and the density of the rock wool of which said body portion is composed is substantially of uniform thickness throughout so that the insulating value of said body portion will be substantially uniform at all points thereof.

The rock wool or similar insulating material of which the body portion 1 is composed is treated with a solution, preferably before the body portion is formed, which renders said insulating material waterproof and also gives additional stiffness and body thereto. The solution used is in the nature of an oil and preferably comprises a mixture of engine oil and paraffin, and although we have found that this solution functions with a high degree of success when used in connection with our invention, we do not wish to be limited to its use, as other solutions may be found which will be suitable for the purpose.

Arranged adjacent to one surface of the body portion 1 is a layer of material 2 for confining the insulating material of which the body portion is formed at that surface thereof. We prefer to use for this purpose a layer of wire screen, preferably of large mesh, and while other forms of wire mesh may be found to be suitable, we prefer to use the material commonly known as "chicken wire" as this material answers our needs perfectly in this connection. Arranged adjacent to the surface opposite to that surface with which the layer of meshed material 2 is associated is a second layer of material 3 of the same type as the layer of material 2, although here, also, other materials may be employed. The layer of material 2 is approximately co-extensive with the surface of the body portion with which it is associated, but this is not true of the layer of meshed material 3, which is of such dimensions that the marginal edge thereof is located inwardly from the marginal edge of the body portion. That is to say, each of the straight edges of the layer of meshed material 3 which comprise the marginal edge thereof is located inwardly a slight distance from the corresponding edge of the body portion 1.

5 designates a plurality of anchor members which connect the layers of meshed material 2 and 3 together and pass through the

insulating material forming the body portion 1 of the insulating structure. The anchor members 5 are preferably in the form of cords or strips of any suitable non-metallic material, although, when our improved insulating units are to be employed for certain purposes, metallic anchor members may be used. In the use of the anchor members of the type shown in the drawings, said anchor members are caused to embrace the wires of one of the layers of meshed material and are passed through the body portion and the ends of each anchor member are knotted together about the wires of the other layer of meshed material, whereby the associated layers of meshed material will be securely tied together.

In the use of insulating units made in accordance with our invention, said units may be arranged within a wall of a refrigerator or room or other structure in a vertical plane, and because the insulating material of which the body portion 1 is formed is treated with material which, in addition to rendering same waterproof, gives additional stiffness and body thereto, there will be no tendency for said material to settle or sag, as was the case heretofore when ordinary untreated rock wool or similar material was used for that purpose and in that manner. Also, aside from the fact that the insulating material is treated to give same greater stiffness and body, the tendency for said rock wool to settle or sag when in use is offset by the fact that said material is confined between the layers of meshed material 2 and 3 and between the anchor members 5.

In Fig. 3, we illustrate the manner in which a wall having corners may be produced with the aid of our improved insulating units, so that there are no direct connections between the layers of meshed material 2 at the inner surface of the insulating wall and the layers of meshed material 3 at the outer surface of said wall.

It will be seen by referring to Fig. 3 that the wires of the meshed material 3 of the two vertical insulating units terminate short of the layer of meshed material 2 at the lower surface of the horizontal insulating unit. Hence, there will be no opportunity for transfer of heat along the wires of said meshed material from the inner surface of the insulating wall to the outer surface thereof. As will be seen by referring to Fig. 3, the horizontal insulating unit is also provided with a layer of meshed material, the wires of which terminate short of the corresponding edge of the body portion 1, and, therefore, there will be no opportunity for transfer of heat from the wires of the layers of meshed material 3 of the vertical insulating units to the wires of the layer of meshed material 3 of the horizontal insulating unit. It is plain, in view of the foregoing, that there will be no transfer of heat from the layers of meshed material 3 to the layers of meshed material 2, or vice versa, of the same or different insulating units, and that there will be no transfer of heat from the layers of meshed material of one insulating unit to the layers of meshed material of another insulating unit.

In addition to rendering waterproof the rock wool of which the body portion 1 is formed, which condition results from the oil filling the interstices between the fibers making up said material when same is compressed to produce a sheet or layer thereof, the paraffin in the treating agent effectively causes said material to solidify when subjected to lowered temperatures. This is important in connection with the use of our invention with refrigerators where the low temperatures acting on the engine oil and paraffin will render the insulating units practically solid insulating blocks.

While we have specified rock wool as being the material which we prefer to use, we do not wish to be limited to its use as slag wool may be used with some success in the production of insulating units made in accordance with our invention. Slag wool and rock wool are both made in the same manner, the only difference between these materials being that rock wool is made from rock high in silica while slag wool is made from furnace slag. Both of these materials come under the general designation of mineral wool.

We claim:

1. An insulating structure adapted for use in flat condition comprising a body portion formed of insulating material, layers of wire mesh arranged in contact with opposite surfaces of said body portion, and non-metallic anchor members extended through said body portion for tying said layers of wire mesh together, an edge of one of said layers of wire mesh being located inwardly a slight distance from the corresponding edge of said body portion.

2. An insulating structure comprising a body portion formed of insulating material treated with a solution for rendering same waterproof and adding stiffness and body thereto, layers of chicken wire arranged in contact with opposite surfaces of said body portion, and non-metallic anchor means extending through said body portion for tying said layers of chicken wire together, an edge of one of said layers of chicken wire being located inwardly a slight distance from the corresponding edge of said body portion.

3. An insulating structure adapted for use in flat condition comprising a body portion formed of insulating material, layers of wire mesh arranged in contact with opposite surfaces of said body portion, and non-metallic anchor members extended through said body portion for tying said layers of wire mesh

together, the marginal edge of one of said layers of wire mesh being located inwardly a slight distance from the marginal edge of said body portion.

In testimony whereof, we have hereunto set our hands.

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