Aug. 21, 1951 H. M. DAY ET AL 2,565,206

INSULATED BUILDING STRUCTURE

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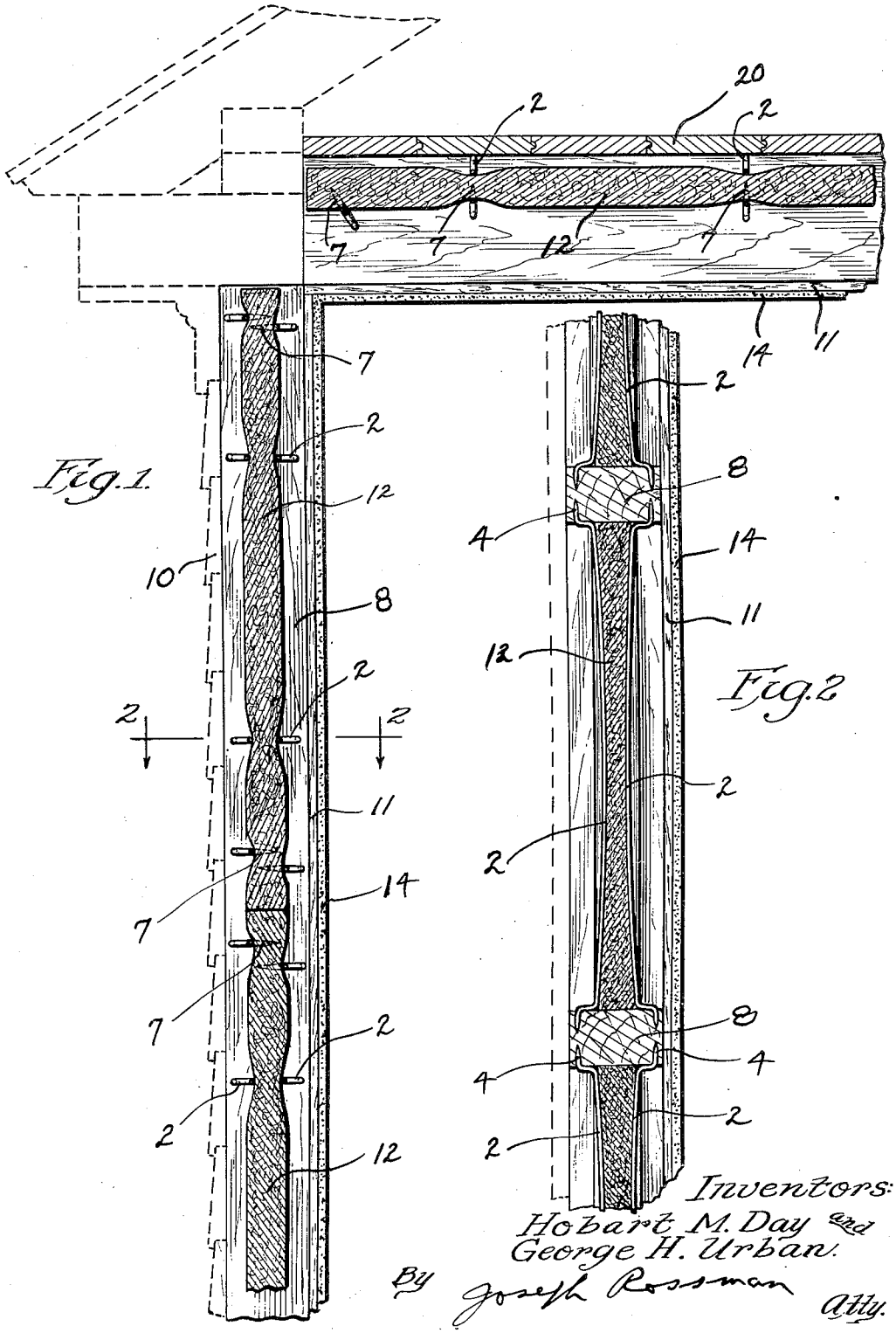


Fig. 1.

Fig. 2.

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Fig. 3.

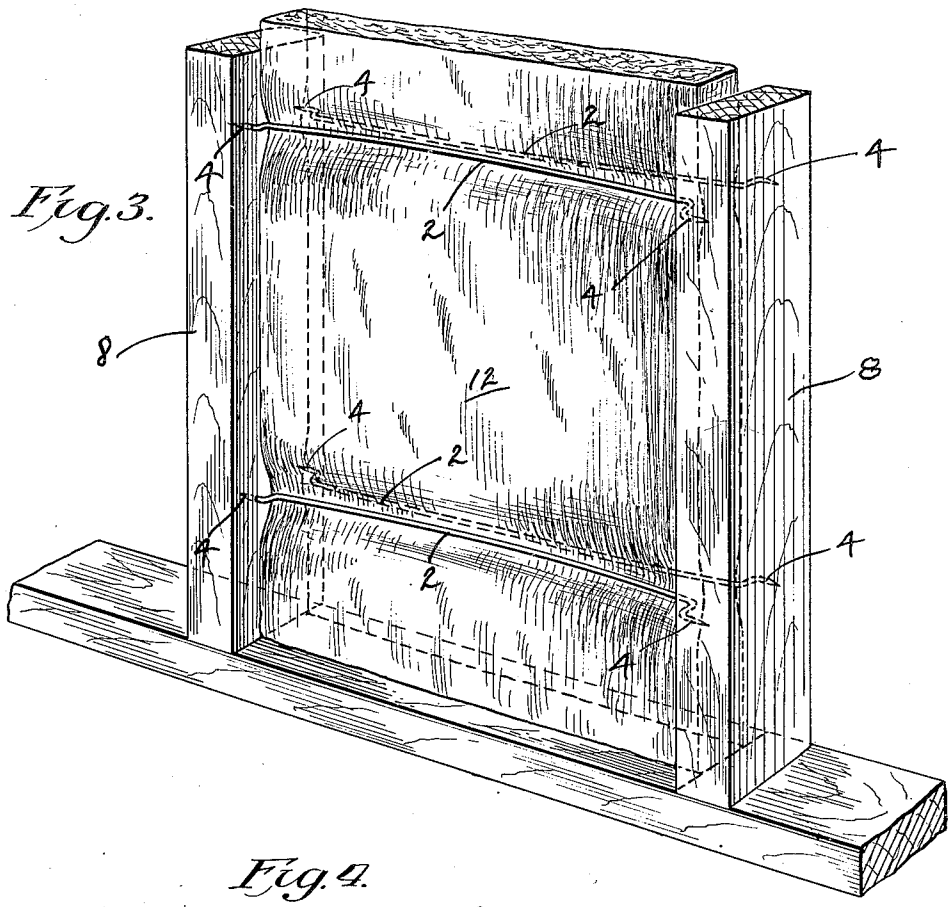


Fig. 4.

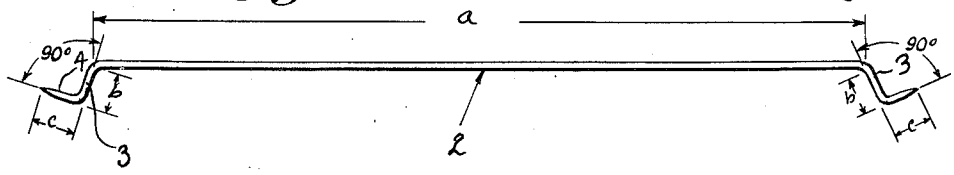
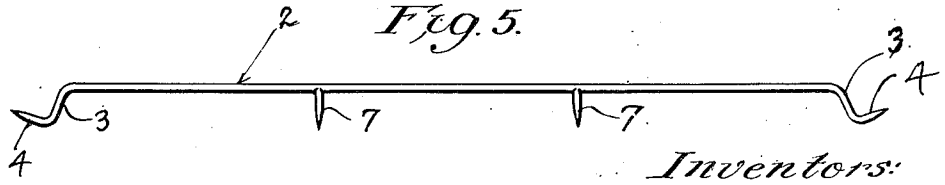


Fig. 5.



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INSULATED BUILDING STRUCTURE

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1 Claim. (Cl. 20—4)

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

It is an object of this invention to provide means for supporting and maintaining insulating material, such as mineral wool bats, 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.

It is a further object of this invention to provide retaining and supporting means for insulating material which is itself self-supporting and requires no additional fastening device. The retaining means of the present invention is also capable of being economically manufactured, installed rapidly to meet the various exigencies frequently encountered during the application of insulation to building frames, as well as to vertical, horizontal and oblique partitions, walls or building enclosures having supporting members to which backing or wall surface forming material is secured.

Other objects and advantages of the invention 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:

Figure 1 is a fragmentary elevational sectional view of a building structure frame which is provided with insulating material and retaining members for the material which are made in accordance with the present invention,

Figure 2 is a top plan view of a wall structure utilizing our invention,

Figure 3 is a perspective view illustrating one form of our insulated wall structure,

Figure 4 is a perspective view of an individual retaininging element, and

Figure 5 is a perspective view of a pronged type of retaining element.

Referring to the drawings, Figures 2 and 3 disclose a building structure frame comprising spaced supporting members 8, such as the usual wood studs employed in the construction of

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houses. The studs 8 support the exterior wall which is usually formed of sheathing 10. Bats or sheets of insulating material 12, which may be made of mineral wool, nodulated mineral wool, wood fibres, and other well-known types of insulating material, are disposed between the studs 8. The insulating material 12 takes the form of sheets or bats 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 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.

In accordance with our invention we provide elongated metal members as shown in Figures 4 and 5 which may be formed of slightly flexible steel metal rods or heavy wire. The retaining members have portions 3 adjacent each end turned downwardly at an obtuse angle to the body of the retaining member and the terminal portion 4 is turned outwardly so that the angle between the two bent portions is about 90°. The ends of the metal members are sharpened so they can be readily hammered or driven into joists or studs, the bent portion 3 providing the impact surface for the hammer or other applying tool. As shown in Figure 5, suitably spaced prongs 7 may be provided along the length of the retaining member welded thereto or integral therewith which are adapted to penetrate the insulating material as shown in Figure 1. The retaining member is made of suitable length so as to extend between spaced supporting building members such as joists or studs. Referring to Figure 1, for example, if the joists 8 are spaced 16 inches apart on centers, the length *a* of the supporting member is made 14⅜ inches and the angularly bent portions *b* and *c* are each ½ inch long.

We prefer to make the retaining members from steel rods or heavy wire, for example $\frac{3}{16}$ inch diameter, so as to have some slight spring or flexibility. The retaining members may also be made of flat steel strap or bands if desired.

By utilizing the retaining elements 2 it is possible to support insulating bats 12 in a wall, floor, ceiling or roof structure so that the bats are spaced away from one or both of the wall surfaces as shown in Figures 1 and 2. In providing such spaced support for the insulating bats a plurality of suitably spaced and vertically aligned

individual retaining members 2 are positioned between the joists or supporting building elements as shown for example at the left side of the upright wall partition in Figures 1 and 2. The retaining elements 2 are spaced a suitable distance inwardly of the outer stud surface and securely fastened by hammering or otherwise forcing the pointed ends 4 thereof into the studs 8.

The insulating bats are then positioned so as to engage and rest against the spaced retaining elements 2. A suitable number of spaced elements 2 are then individually positioned in vertically aligned relation and their pointed ends 4 hammered or forced into the studs 8 at points spaced inwardly of the outer stud surfaces. The insulating bats 12 will then be securely retained in place between the studs and are so positioned as to provide air spaces on either side thereof when sheathing 10 is applied to the outer side and lath 11 and plaster 14 to the inner side.

We may use plain elongated retaining members, as shown in Figure 4, or retaining members provided with suitably spaced prongs as shown in Figure 5 which are adapted to penetrate the bats and retain them more securely in place, particularly at the points where the supporting building elements intersect or adjacent the ends or edges of the bats where the bat is likely to disintegrate or fall apart. The prongs thus ensure the life of the bats by retaining them more securely in position.

It will be noted, as shown in Figures 2 and 3, that the retaining members 2 are preferably made of flexible steel rods or wire so that they can be slightly flexed or bowed inwardly so as to engage the insulating bats and partially embed themselves into the surface of the bats so as to ensure their positive retention in the desired location. Furthermore, the flexibility of the retaining members and their angularly bent ends makes it possible to compensate for variations in dimensions which may occur between studs, joists or other standard building retaining members so that the workmen can position and fasten the same rapidly without loss of time even though the dimensions vary from place to place.

Our retaining elements can be used with equal facility for vertical wall structures or for floors or roofs. As shown in Figure 1, a plurality of spaced retaining members 2 may be positioned beneath the floor 20 so as to support and retain insulating bats 12 in spaced relation thereto.

It will be seen that the present invention provides a simple and economical support for insulating materials, 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 retaining members can be installed at the same time as the insulating material itself and by the same workmen, and thereby reduce installation expenses. Furthermore, the retaining members effectively hold 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.

We claim:

A retaining element for supporting insulating bats between spaced building supporting elements comprising an elongated body portion of a length adapted to extend between spaced building supporting elements, relatively short portions of said retaining members adjacent each end being bent at an obtuse angle to the body of said retaining member and then reversely at an angle of about 90° to said outwardly bent portion and the ends thereof being sharply pointed and adapted to be securely inserted into said supporting members, all of said end portions being in the same plane, the said angles at each end of said element being spaced apart to provide a length of said element between said angles sufficient to permit the application thereto of a driving tool for forcing the pointed end into a supporting member.

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