Nov. 4, 1941. J. C. MORRELL 2,261,480

BUILDING STRUCTURE

Filed Feb. 13, 1939 2 Sheets-Sheet 1

Fig. 1.

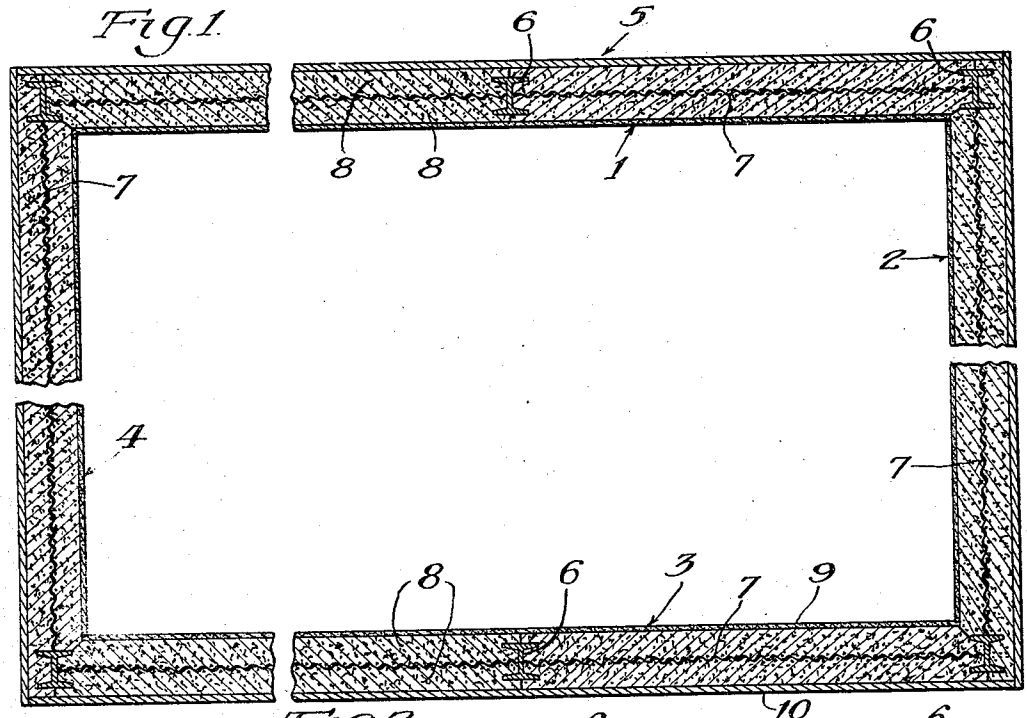


Fig. 2.

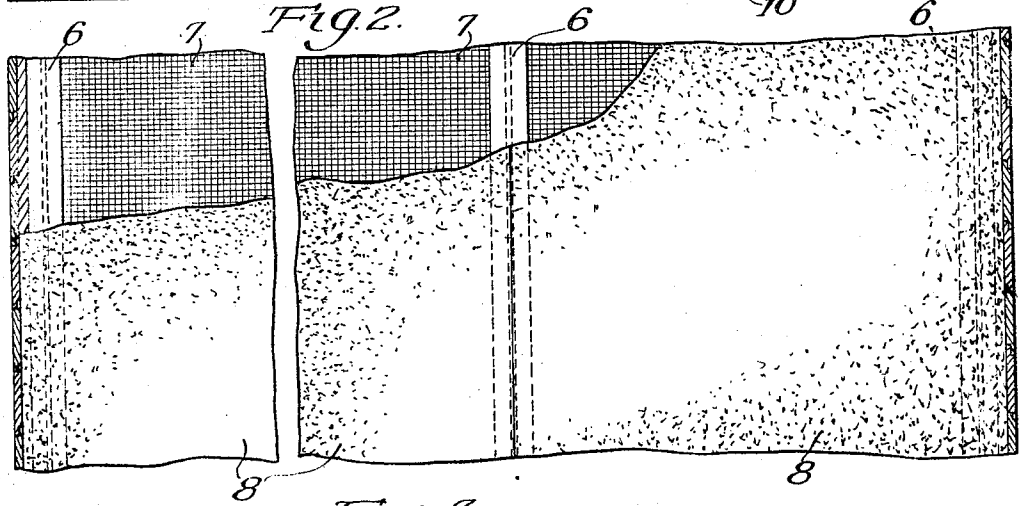
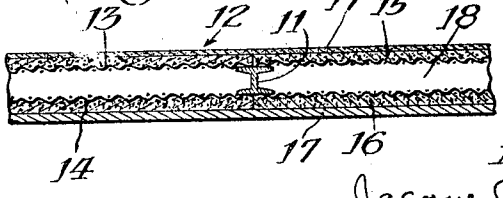


Fig. 3.



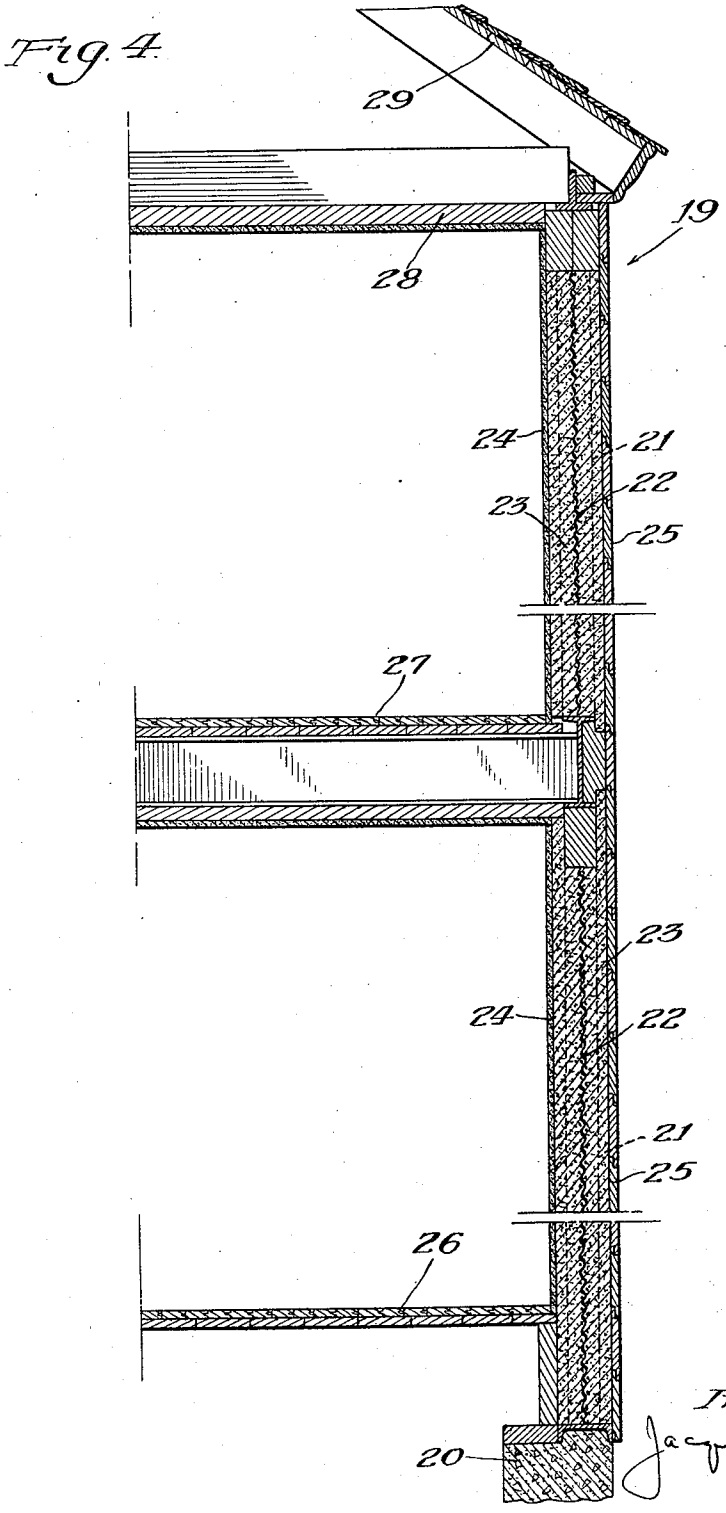
Inventor:
Jacque C. Morrell

Nov. 4, 1941. J. C. MORRELL 2,261,480

BUILDING STRUCTURE

Filed Feb. 13, 1939 2 Sheets-Sheet 2

Fig. 4.



Inventor:
Jacque C. Morrell

Patented Nov. 4, 1941 2,261,480

UNITED STATES PATENT OFFICE

2,261,480

BUILDING STRUCTURE

Jacque C. Morrell, Oak Park, Ill.

Application February 13, 1939, Serial No. 256,122

4 Claims. (Cl. 72—16)

This invention relates to improvements in a method and means for constructing buildings and refers more particularly to the method of applying the insulating material thereto and suitable frame work for the application of the said insulating material. The building itself may be made up of the regular frame work of wood or steel studs and beams preferably of steel with provision such as screening or expanded metal attached to the studs for applying the insulating material. In another aspect a suitable frame work preferably steel, may be erected with skeleton or core walls on each side of the studs of heavy screening, fence material, expanded metal or a reticulated member to which may be applied the insulating material hereinafter described. The application of exterior and interior finish will complete the walls of the building. These may be applied direct by anchoring to the studs, or attaching to nailing strips or may be superimposed upon sheeting material so supported.

The insulating material is made up of a mixture of materials, one component of which is preferably of a fibrous character having insulating properties and the other of an adhesive character, the mixture being discharged upon the skeleton frame work comprising a wall and supporting members of the building. In general the building wall comprises a plurality of frame members and a reticulated or perforated sheet secured to an adjacent supporting frame member, the reticulated sheet and supporting frame members being surfaced with the insulating material.

Referring to the drawings,

Fig. 1 is a top plan sectional view showing the structural frame work, the reticulated members and the insulation, etc., supported thereby.

Fig. 2 is a fragmentary side elevational view partly in section and partly broken away of Fig. 1.

Fig. 3 is a cross-sectional view of a modified form of my invention.

Fig. 4 is a side elevational view in cross section showing a building constructed in accordance with my invention.

Referring in detail to the drawings, **1**, **2**, **3** and **4** indicate the four walls of a building **5**. The walls illustrated are all external walls, but it is to be understood that internal walls or partitions (not shown) may be constructed in a similar fashion.

The frame of the walls **1**, **2**, **3** and **4** comprises essentially a plurality of vertically disposed studs **6** which are appropriately spaced from each other, the studs being illustrated as iron members of a T section. Of course, the usual wooden stocks may be employed if desired. Reticulated members **7** are positioned between adjacent studs **6**, the edges of said members being secured to the webs or flanges of the studs, as the case may be, by welding, rivets, bolts or the like (not shown). The reticulated members **7** may comprise metal screens, expanded sheet metal, or any type of perforated sheet material of desired structural strength.

The bulk of the walls **1**, **2**, **3** and **4** is made up of a wall material **8** which may comprise various insulating materials and adhesives made up e. g. of materials, preferably fibrous in character, having good insulating qualities. Examples of these insulating materials are animal, mineral and vegetable fibrous material in various forms, for example, hair, bagasse (fibrous material from sugar cane), straw, corn stalks, spun glass or similar straw corn stalks and similar vegetable material, glass, wool, mineral fibre, or similar artificially made mineral wools having insulating characteristics, asbestos and the like. These fibrous materials may be made up in the form of paper, for example, waste paper, rags, waste felted materials and the like. Admixed with these materials are various types of adhesives such as cements, glues and pastes. Among the suitable cements may be mentioned those made from Portland or hydraulic cement, sodium silicate with materials such as asbestos and other fillers, cements made from asphalts, tars and pitches, (in a molten state or dissolved in a suitable solvent) cements made by mixing lime, litharge and various drying oils such as linseed, soy bean, and similar drying oils alone or in admixtures with various resins and gums both synthetic and natural, various filling materials such as whiting, barium sulphate, pigments, such as ochre, sienna, clays, gypsum and the like, special cements of heavy metal salts such as those containing zinc oxide, zinc chloride (sorel), and ammonium chloride, cements made from casein, lacquers, varnishes, mucilage, glues, etc. in various admixtures. The inorganic cements are preferred for example, mixtures containing hydraulics or Portland cement, sodium silicate, etc., but organic materials may be used with the inorganic materials for example, casein in sodium silicate, litharge and glycerine, iron filings and sodium silicate, lime, ammonium chloride, iron filings and sand. Glues, gutta percha, rosin pitches and various admixtures with inorganic filling material such as those mentioned above also form the basis of a cement.

In short, various mixtures of inorganic or inorganic and organic or organic materials having adhesive properties such as those mentioned may be made with the fibers or other insulating materials such as infusorial earth, gypsum, with or without various mineral fillers, and the like in such admixtures as to form an adhesive material which will adhere to the surface of the metal comprising the reticulated or expanded core of the walls and the supporting stud or frame work of the walls by projecting the same thereon, preferably by blowing with compressed air.

After the reticulated members 7 have been mounted upon the studs as hereinbefore described, the insulating material admixed with the desired adhesive is blown upon one or both surfaces of the reticulated members, it being understood that the blowing operation takes place before the adhesive has set or lost its adhesive properties. The blowing is continued until a desired thickness of insulating material 8 is built up upon one or both surfaces of the reticulated members.

An interior finish 9 and an exterior finish 10 may then be applied to the walls to cover the insulating layer or layers 8. The interior finish 9 may, if desired, comprise plaster, wall board or the like and the exterior finish 10 may, if desired, comprise wooden sheathing, brick or any other conventional outer surfacing.

It is to be understood, of course, that my invention is particularly directed to the method of application of the material 8 to the reticulated base and is not vitally concerned with the type of wall finishing surfaces or the manner in which such surfaces are applied.

One of the chief disadvantages in utilizing insulating material in bulk or discrete as opposed to employing the insulating material in sheets, webs or bats, is that the material within the walls tends to pack at the lower ends of the walls after it has been inserted therein. This settling or packing is due primarily to vibration and results in a wall having densely packed insulating at its lower portion and little or no insulating material in its upper portion.

It can readily be seen that my invention not only contemplates a convenient, efficient and economical method of applying the insulating or wall filling but also results in a wall wherein the insulating material or wall filling remains substantially homogeneous as to density throughout the height of the wall due to the fact that the insulating or filling material sets upon the reticulated member before it has had sufficient time to settle.

Of course, in new constructions the insulating or filling material is preferably blown upon the faces of the reticulated members. However, in old work, that is, in completely constructed walls, holes may be bored at the top of the wall and the blowing nozzle may be inserted to blow the insulating or filling material downwardly into the wall. The fact that the insulating or filling material carries an adhesive, of course, causes the material to remain a uniformly dense state within the wall and settling or packing of the insulating or filling material will thus be prevented.

Referring particularly to Fig. 3, a slightly modified form of my invention is shown wherein 11 indicates one of a member of suitably spaced studs constituting the supports for a wall 12. Spaced reticulated members 13 and 14 may be secured in any desired fashion to the opposite flanges of the studs 11. Insulating or filling material 15 carrying a suitable adhesive may be blown upon the outer face of the member 13 to build up a desired thickness and similarly insulating or filling material 16 carrying a suitable adhesive may be blown into contact with the outer face of the member 14. Finishing materials 17 may then be applied to the exposed surfaces of the layers 15 and 16. This form of wall construction has advantages which may be obtained in certain types of wall construction, particularly by the provision of the sealed air space 18.

Referring particularly to Fig. 4, the application of a wall, made in accordance with my invention, to a conventional building 19 is shown. The building 19 is carried upon a foundation 20 which is adapted to support studs 21. Reticulated members 22 are carried by the studs 21 and insulating or filling material 23 carrying a suitable adhesive is blown upon both surfaces of the reticulated members 22. An inner surfacing material such as plasterboard, wallboard or plaster 24 is applied to the exposed inner surface of the material 23 and sheathing 25 is applied to the outer surface thereof. The numerals 26, 27, 28 and 29 indicated respectively, the first floor, second floor, ceiling and roof.

Regarding the interior and exterior finishes as applied to buildings such as houses, office buildings, factories and the like, any desired form and type may be employed. When plaster is employed as an interior finish it may be applied directly to the interior surface although expanded metal lath, wire mesh or similar material may be utilized as a base when desired. Stucco, kellastone, brick or stone veneer may be applied over the sheathing or directly attached employing suitable reinforcing material over the insulating material when necessary. Wood or metal siding of any desired type may also be used either with or without the sheathing. Wherever necessary suitable nailing strips, anchoring bolts, metal clips and the like may be used to attach the interior or exterior finishes to the reinforcing metal and/or the insulating material. Composition interior and exterior finishes may also be employed internal with the sheathing or separately. It will of course be understood that various combinations of the features of the invention other than the combinations illustrated and described will be obvious to those skilled in the art and are therefore entirely within the scope of the invention, as defined by the appended claims.

I claim as my invention:

1. A wall comprising, in combination, spaced studs disposed in a common plane, a perforate metal member extending between and secured to said studs, a set plastic mixture consisting predominantly of particles of fibrous insulating material and a binder therefor covering and bonded to said perforate member and presenting a continuous exterior surface on at least one side thereof, which surface is spaced outwardly from adjacent faces of the studs, whereby the latter are covered by a substantial thickness of the insulating mixture, and an imperforate, relatively stiff coating of wall surfacing material disposed over said surface of the mixture.

2. The wall defined in claim 1, wherein said perforate member is disposed intermediate opposite faces of the studs and said mixture substantially fills the space between adjacent studs and embeds said perforate member.

3. A wall comprising, in combination, spaced

studs disposed in a common plane, perforate members extending between and secured to the studs on opposite sides thereof, a set plastic mixture consisting predominantly of particles of fibrous insulating material and a binder therefor covered and bonded to each of said perforate members and presenting exterior surfaces spaced outwardly from opposite faces of the studs, whereby the latter are covered by a substantial thickness of the insulating mixture, and an imperforate, relatively stiff coating of wall surfacing material disposed over at least one of said exterior surfaces.

4. The wall defined in claim 3, wherein a space is provided between adjacent studs intermediate said perforate members.

JACQUE C. MORRELL.