This invention relates to a method of making building material.

It is an object of this invention to produce a light panel for use in the construction of buildings which has heat and sound insulating properties, is fireproof and impregnable against attacks of termites and other injurious insects and decay, and above all, is permanently secure against warping.

In its general aspects, the invention resides in a method of producing a panel composed of a core of light fibrous material having heat and sound insulating properties with its opposite faces covered with veneer, plywood or other suitable material, and provided with a marginal frame, the composite structure being so assembled as to prevent warping and preferably being impregnated with a suitable solution to render the same fireproof and termite-proof.

Hereinafter, where building panels of this general nature have been made, warping could not be avoided. It is thus a primary object of the present invention to provide an improved method of making a building panel of the character described which is positively secure against warping regardless of the conditions under which the panel is used.

With the above and other objects in view which will appear as the description proceeds, this invention resides in the novel method as more particularly defined by the appended claims, it being understood that such changes in the precise embodiment of the hereindisclosed invention may be made as come within the scope of the claims.

The accompanying drawings illustrate one complete example of the physical embodiment of the invention constructed according to our method for the practical application of the principles thereof, and in which:

Figure 1 is a perspective view illustrating a portion of a building panel constructed in accordance with this invention;

Figure 2 is a perspective view with the component parts of the panel separated to illustrate its construction;

Figure 3 is a perspective view of a completed panel of slightly different construction;

Figure 4 is a detail section view through the panel as on the plane of the line 4—4 to show one step in its manufacture; and

Figure 5 is a diagrammatic view illustrating the different steps in the manufacture of the panel.

Referring now particularly to the accompanying drawings in which like numerals indicate like parts throughout the several views, the numeral 5 designates a building panel constructed in accordance with this invention and comprising a core 6 covered on both sides by sheets of wood veneer or plywood 7. A frame 8 is provided about the margin of the panel, the frame 8 having a thickness equal to that of the core 6.

The core 6 may be of any suitable material having sound and heat insulating properties, such as excelsior bound with magnesia cement or the like, or particles of cork with a bituminous binder. In each instance, however, it is essential that the core be light, soundproof, and have heat insulating properties.

An excellent core material having a coarse fibrous texture has been found to be the commercial product known in the trade as "Thermatex". This material has all of the necessary qualifications, but its surfaces are too coarse for optimum conditions of bonding between the core and the panels. The slabs or panels of core material are thus treated as now about to be described.

When the core material is received at the factory, it is first thoroughly dried in any suitable drying chamber. Next, its surfaces are coated with a thick paste-like mixture to fill all holes and render the same perfectly smooth. The mixture used is composed of sawdust, Epsom salts, waste magnesite, and water, in the following proportions:

For ten liters of water—
Epsom salts—10 kg.
Waste magnesite—6-7 kg.
Sawdust—a sufficient amount to thicken the mixture.

Before the core panels are coated with this mixture, they are sprayed with a three per cent solution of sulphuric acid. In this manner the core material is rendered free from objectionable bacteria and prepared for the application of the surface covering mixture.

After the surface of the core material is thoroughly dried and the slabs have been cut to the proper size, they are disposed in the wooden frames 8.

The frames 8, as shown in the drawings, are composed of rails, each of which consists of a plurality of small strips glued together in such relationship with respect to their grain as to guard against warping. With the slab properly disposed within its frame, it is passed through a glue applying machine to have both surfaces coated with a thin layer of glue.
The glue employed preferably is a cold casein glue. To preclude objectionable bacteroidal action in the glue, a creosote preparation is mixed therewith. This creosote treatment is an important step in the manufacture of the panels for without it fermentation and other objectionable consequences in the glue would be inevitable.

With both surfaces of the assembled core and frame coated with glue, the surface panels 9 which are preferably although not necessarily formed of wood veneer, are applied and then the entire structure is placed in a hot steam press.

To facilitate production, the press employed is provided with a plurality of superimposed hollow plates 9 (see Figure 5), between which the individual panels are disposed. All of the hollow plates 9 are connected with a steam inlet to be heated thereby so that during the application of pressure, the panels are thoroughly heated.

The pressure employed is at least one hundred and twenty (120) atmospheres and the time required for the gluing operation is between one-half (½) and three-quarters (¾) of an hour depending upon the thickness of the panels.

To enable moisture forming within the interior of the panels to escape during the drying of the units subsequent to the gluing operation, the frames are provided with drilled holes 10. With the thinner panels, these drilled holes 10 to prevent their being closed up during the application of pressure have metal pins 11 (inserted therein which extend into the core a short distance, as specifically shown in Figure 4.

After the gluing operation, these pins are withdrawn to provide the desired ports for the escape of internal moisture while the units are being dried and after the drying the holes are again closed by wooden pegs which by reason of their projection into the core add to the rigidity of the structure.

The drying of the units after the gluing is also important. It can be done in any ordinary drying room, but is preferably done in the stages or steps, the first at a temperature of approximately forty-five degrees centigrade and the second at twenty degrees centigrade. Three to five days should be allowed to insure thorough drying.

In the description this far no reference has been made to the impregnation of the unit to render the same fire-proof or fire resistant and insect-proof. It is preferable to impregnate the component parts of the panel prior to the gluing treatment so as to insure uniform penetration. This is graphically illustrated in Figure 5, but it is also possible to complete the manufacture of the units and then subsequently impregnate the same.

The solution used for rendering the units fire-proof or fire resistant may consist of soluble silicate, boracic acid, phosphate of ammonia, bromide of ammonia, etc. For protection against parasites and decay, acid fluorides, such as fluoride of sodium, zinc fluoride, perchlorate of mercury, naphtho-sodium, etc., may be used.

The particular manner of impregnation is not important, the primary consideration being the subjection of the panel to a sustained heat treatment while maintaining the same flat so that all internal tension and stress in the individual layers is entirely eliminated whereby the finished product is permanently secure against warping.

Inasmuch as the outer surfaces of the finished 10 unit are composed of wood, it is possible to give the same desired surface treatment. For exteriors, a protective coating of paint may be desirable and for interior use, the panel may be finished like any other wooden surface, or it may be supplied with a surface treatment which gives it the appearance of a plastic substance or of porcelain, etc.

From the foregoing description taken in connection with the accompanying drawings it will be readily apparent to those skilled in the art, that the material of this invention, being light and soundproof and permanently secure against warping, fits admirably into modern building practice. It is especially well suited for use as doors, and the walls, floors and ceilings of buildings, but many other uses will suggest themselves.

What we claim as our invention is:

1. The hereindescribed method of making a building panel having a core of sound and heat insulating material and covered on both sides with plywood or the like, which includes surrounding the core with a wooden frame having vent holes therethrough, coating the assembled core and frame with glue on both surfaces, applying the plywood panels to the opposite surfaces of the assembled core and frame, subjecting the assembly to pressure and heat while the vent holes are closed by metal pins to prevent their collapse, which pins extend into the core, releasing the unit from the heat and pressure, and withdrawing the metal pins to allow internal moisture to escape therethrough said vent holes.

2. The hereindescribed method of making a building panel having a core of sound and heat insulating material and covered on both sides with plywood or the like, which includes surrounding the core with a wooden frame having vent holes therethrough, coating the assembled core and frame with glue on both surfaces, applying the plywood panels to the opposite surfaces of the assembled core and frame, thereafter closing the vent openings, then subjecting the assembly to pressure and heat while the vent openings are closed to prevent the collapse of the vent openings releasing the building panel from the heat and pressure and then opening the vent openings to allow internal moisture to escape through the vent holes.

OSCAR NEESEN.

FRIEDRICH ALFRED SIESS.