Jan. 3, 1928. 1,654,522

H. S. ASHENHURST

METHOD OF INSULATING BUILDINGS

Original Filed Sept. 10, 1924

Fig. 1

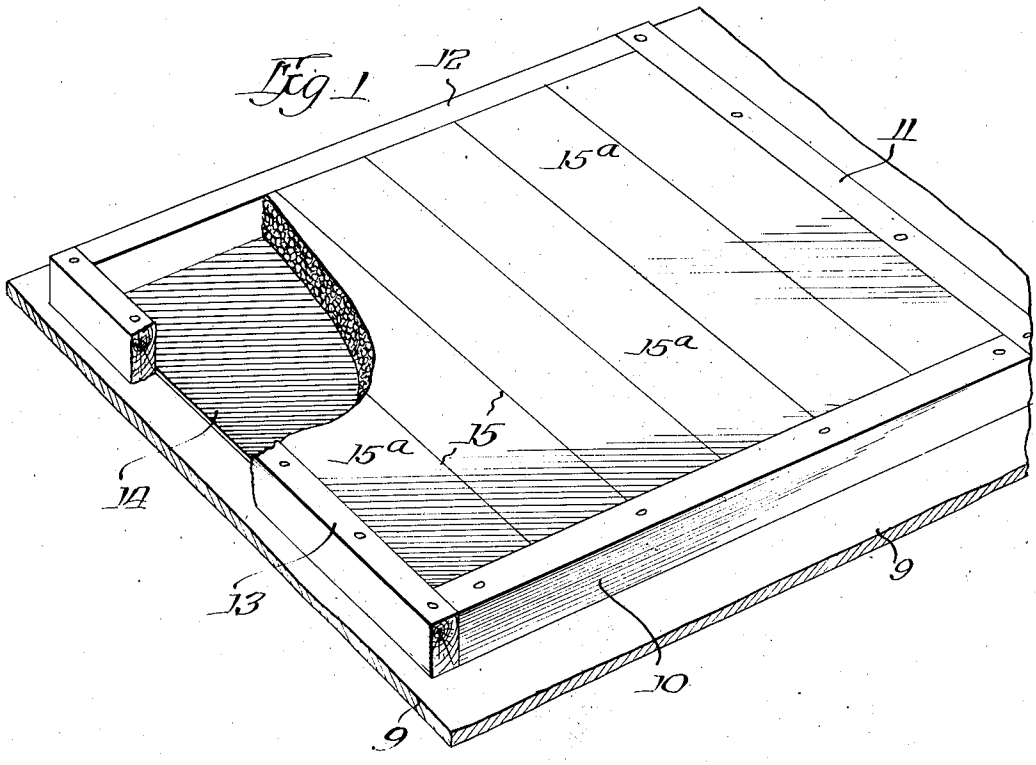


Fig. 2

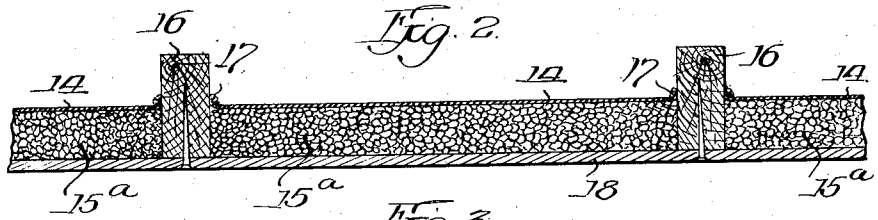


Fig. 3

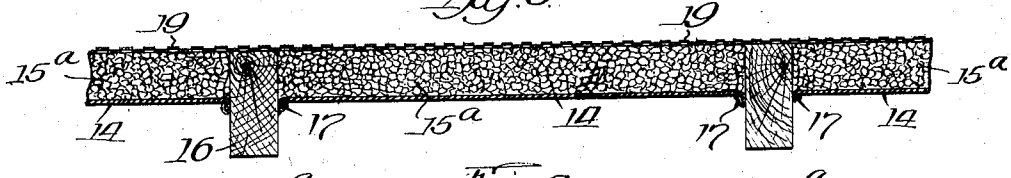
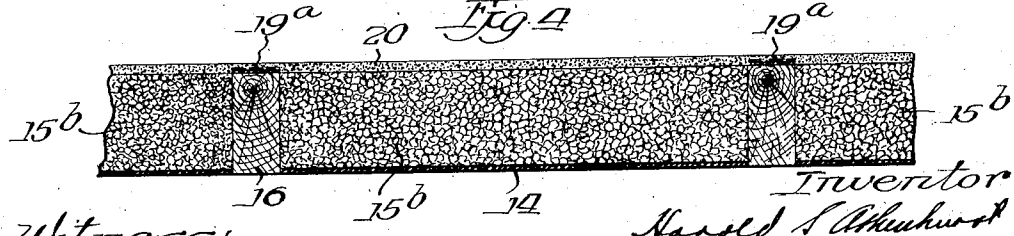


Fig. 4



Witness:

Inventor.

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By Chas. F. Murray Atty.

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UNITED STATES PATENT OFFICE.

HAROLD S. ASHENHURST, OF CHICAGO, ILLINOIS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO INSULEX CORPORATION, OF CHICAGO, ILLINOIS, A CORPORATION OF DELAWARE.

METHOD OF INSULATING BUILDINGS.

Application filed September 10, 1924, Serial No. 736,893. Renewed March 21, 1927.

My invention relates to a process for insulating and fireproofing the walls of buildings, and has for one of its objects the provision of a new and improved process by which the insulation is prepared in the field, that is, at a point adjacent to the walls to be insulated. By this I intend to distinguish from a process in which the insulation is prepared in a distant factory, and thereafter dried and shipped or transported to the place of use.

One of the objections to the method last described is that where insulating blocks composed of cementitious material are manufactured for shipment to the place of use, such blocks must be fully dried in order to eliminate the excess weight of water before shipment and this requires time and space within which the drying is to take place. By my process this is eliminated, as the insulating blocks are formed on the job, and may be immediately placed in position, the drying taking place thereafter. This has other advantages also in that the blocks may be formed in the necessary shapes and sizes while the material is still soft, thus avoiding the necessity for sawing.

One of the important advantages in the use of a method by which the blocks are produced at the point of use is the elimination of breakage that results from handling and shipping. This element of breakage adds a definite and substantial item to the cost of production and is eliminated by my improved process.

As a method of insulation, the steps disclosed herein provide for relatively great economy. The material from which the insulating blocks are formed is inexpensive, being mainly gypsum. The light weight of the final structure contributes not only to the insulating value but to economy in cost of materials. The block formed in accordance with the process possesses many advantages. When dry it is relatively rigid and strong; it is fire-resisting to a high degree and will not break down under any temperature, except possibly that present in a conflagration; it is substantially non-hygroscopic and is, therefore, suitable for walls of all kinds of buildings. When in place the material of which the insulating blocks are composed provides an ideal plaster surface, this for several reasons. One reason is that the surface is composed largely of open cells such as those which appear throughout the body of the material and these cells provide an ideal key for the plaster.

The invention will be more readily understood by reference to the accompanying drawing, in which;

Fig. 1 is a perspective view of a temporary form with a quantity of the block-forming material therein;

Fig. 2 is a transverse sectional view through a vertical wall to which the insulating blocks have been applied against an outer sheet or wall;

Fig. 3 is a similar view showing a construction in which the blocks are applied against lath secured to the studding on the inside, and,

Fig. 4 is a view showing a method of construction in which plaster is directly applied to the blocks to provide a wall surface.

According to the method here disclosed, I provide at a point adjacent to the wall to be insulated, a plane horizontal surface, such as a floor 9, and place thereon side members 10, 11, 12 and 13, thereby defining a shallow, rectangular, open-top space, the depth of the side members being preferably equal to the thickness of the blocks to be formed. I then place in the bottom of the space a strip of building paper 14, and pour thereon a plastic mass composed of gypsum as the major ingredient, and chemicals that in the presence of water will evolve a gas and cause the expansion of the mass. When the water is added the body becomes cellular throughout. A type of materials adapted for use for forming this mass is set forth in my prior patent, reissued as No. 15,952, on November 25, 1924. I wish it distinctly understood, however, that I contemplate the employment of any material by means of which a quick setting, light-weight block may be formed.

When the material has risen and before setting is completed, I may prefer to level

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off the top, either by screeding or troweling. By this means I not only provide a level top surface, but I strengthen the surface and insure a relatively dense skin which adds to the strength of the material. It will be understood that the cells at the top are relatively thin and the material surrounding the cells is fragile. By breaking down the cells, as by troweling, the surface is hardened and made more dense. I do not, however, wish to claim by this application either the method of screeding or troweling as above set forth nor the product produced by the practise of that method, since such subject matters are disclosed and claimed by my Letters Patent No. 1,613,639, granted January 11, 1927, and my co-pending application, Serial No. 736,892, filed September 10, 1924.

Shortly after the initial setting takes place, which occurs within 15 or 20 minutes after pouring, and while the material is still relatively soft and wet, I subdivide the large block along the lines 15, into a plurality of smaller blocks 15^a, of the desired size and shape. This is easily accomplished by employing a straight-edge and a thin blade that will pass through the cellular material and the paper at the bottom thereof. Thereafter I remove one or more of the side members, preferably the member 13, and lift the adjacent block from its position. The paper 14, adheres strongly to the block and serves as a reinforcement. It will be understood that at this time the block is relatively soft, and without sufficient rigidity to resist any substantial shocks or strains.

Immediately thereafter, if desired, the blocks may be placed in a wall and in the drawing I have illustrated a plurality of studs 16, the space between which will preferably correspond to the width of the blocks. The blocks are removed from the adjacent mold and placed in superposed relation to complete the wall to the desired height. Preferably the blocks are placed in position against a wall or sheathing with the adhering paper outside. Thereafter a quantity of cement or plaster is forcibly thrown into the corners and will strongly adhere to the studding and the paper. This cement is indicated at 17.

In Fig. 2 I have illustrated a wall having an outer sheathing 18, suitably secured to the studding and the insulating blocks are placed against this wall with the paper backing on the exposed side. Of course, if desired, blocks may be formed of such thickness as to completely fill the space between the studding, but for ordinary purposes this will be found unnecessary. If it be desired to provide a wall to which plaster may be applied, the blocks, indicated at 15^b in Fig. 4, are so placed that a surface other than the surface covered by the paper is placed flush with the surface of the studding. If strips of metal lath 19^a are tacked to the studding, plaster 20 may readily be applied to the entire surface.

In Fig. 3 a construction is shown in which the outer sheathing or covering has not been applied. However, metal lath, indicated at 19, has been applied to the inner surface of the studding and the blocks 15^a are placed thereagainst. It will be understood that the open side of the wall will be completed in any desired manner.

While I have shown a wall having studs between which the blocks are received, it will be understood that I contemplate the insulation of a wall in the described manner regardless of the structural characteristics of the wall. It is practical in some instances to build the wall without studding, merely placing the blocks in proper relation, one upon another. It is also possible to construct a wall having relatively narrow studding and to completely imbed the studding in the blocks by shaping the blocks around the studding in the process of building. Such construction is claimed in a copending application Serial No. 736,891, filed September 10, 1924. It will be understood that while I have illustrated a method by which the blocks are formed by subdividing a larger block that is cast in the field, a desirable result might be secured by separately casting blocks in the field in the described manner.

The blocks formed as described and a sound proof wall composed of the so-formed blocks, are the subjects of copending applications for patent Serial No. 12,882, filed March 3, 1925, as a division of this application, and Serial No. 736,891, filed September 10, 1924, respectively, and are not specifically claimed herein.

I have obtained very good results in the practise of this invention by the use of the materials as set forth in my Reissue Letters Patent No. 15,952, the same being prepared by mixture on the job with sufficient water for making a free flowing paste, such materials comprising 100 pounds of calcined gypsum, 2 ounces of commercial retarder, 3¾ pounds of a suitable carbonate, such as calcium carbonate, and 8 pounds of aluminum sulphate containing water of crystallization, all of such ingredients being finely ground and thoroughly mixed in a dry state.

By the use of my invention, the cost of manufacture of the blocks is very materially reduced, eliminating the trouble and expense of drying and storing the blocks which are placed immediately in the wall after their formation, cutting down the freight charges materially, preventing breakage of the blocks, eliminating the necessity for sawing the blocks and very materially assisting in the proper fitting of the blocks in

place. By the use of my invention, I am enabled to make and place in a wall a lighter and more porous block than could be employed to advantage where it was necessary to ship the blocks to the job from a factory.

I claim:

1. The method of making insulating blocks in the field, which consists in providing an open top space, then pouring thereinto a plastic mass that will expand to substantially fill said space, then subdividing the material after it has expanded and set, then immediately applying the subdivisions to a wall.

2. The method of forming insulation blocks in the field, which consists in providing a horizontal plane surface, and side members defining an open top space, then casting therein a quantity of plastic material that will expand and set, then permitting said material to expand to substantially the height of the side members, then subdividing the expanded material after it has set, then immediately applying the sections to a wall.

3. The method of insulating the walls of a building, which consists in casting a section of cellular material, then subdividing said section before the material thereof is dry, then immediately applying the subdivisions between the structural elements of the building.

4. The method of insulating buildings, which consists in providing a relatively large, shallow, open top space, pouring thereinto a plastic mass that will expand and set to form a cellular material, then cutting said cellular material before it is dry and immediately applying the separate sections between structural elements of a building.

5. The method of insulating a building wall, which consists in providing a molding space and delivering thereinto a quantity sufficient to substantially fill said mold, of a material that will expand and set, the dimensions of a finished section of said finished material being such as to require the section to be forced between the structural elements of said wall, said sections being removed from the mold and applied to the wall before the material composing the sections is dry.

6. The method of insulating a building wall, which consists in casting in the field a body of cellular material composed of a substance that will set, then applying a cast section of said material between the structural elements of the building before final setting has taken place, the material at the time of application being yielding to enable the cast section to be easily forced into position for final setting in rigid relation to the said walls.

7. The method of insulating a building wall, which consists in casting in the field a section of cellular material composed of a substance that will set, then removing the cast section before final setting has taken place and applying the section between the structural elements of a building while the material composing the section is relatively soft and yielding and permitting final setting to take place in its ultimate position.

8. The method of insulating a building wall, which consists in casting a relatively large section of cellular material adapted to set, the depth of the section being equal to the thickness of the insulating blocks to be formed, then subdividing said section to provide a plurality of blocks of a size to fit snugly between the structural elements of a building, the subdividing being done while the material is still wet, then immediately applying the subdivisions to the said wall and permitting the final setting to take place with the material in its ultimate position.

9. The method of making a wall, which consists in applying to a support a plastic block of porous insulating composition immediately after it has expanded and set from the molding operation.

10. The method of making a wall, which consists in casting a plastic body that will expand and set to form a porous block of insulating material in the field, then applying said block to said wall immediately after the material has expanded and set.

11. The method of insulating buildings, which comprises the step of applying to a support a block of insulating material while still plastic after the operation of molding it.

12. The method of insulating buildings, which comprises the step of forcing snugly into position between two supports a block of insulating material while still plastic after the operation of molding it.

13. The method of insulating buildings, which comprises fitting together in a wall a plurality of blocks of insulating material while still plastic after the operation of molding them.

14. The method of insulating buildings, which comprises the steps of forming blocks of light porous insulating material by a molding operation in contact with reinforcing members, and then placing such blocks in a wall formation while still plastic after the molding operation.

Signed at Chicago, Illinois, this 3rd day of September, 1924.

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