June 3, 1941. D. T. DOWNES 2,244,489

BLOCK MOUNTING

Filed March 25, 1939 2 Sheets-Sheet 1

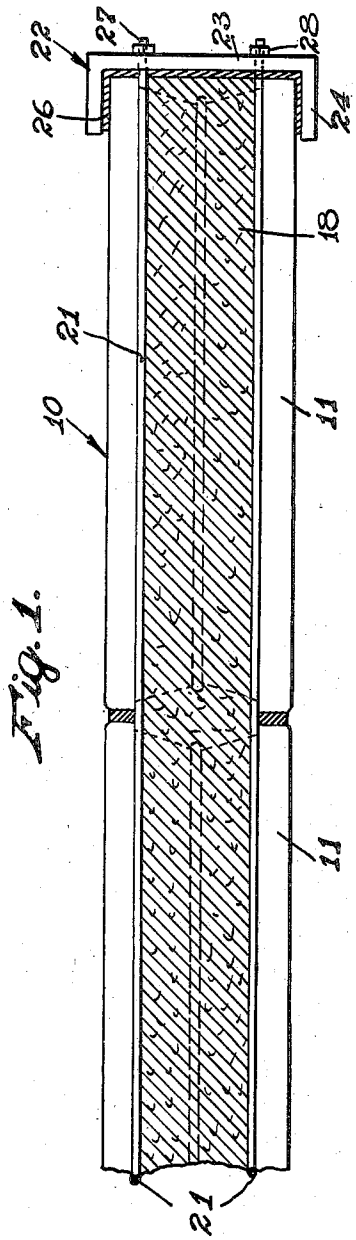


Fig. 1.

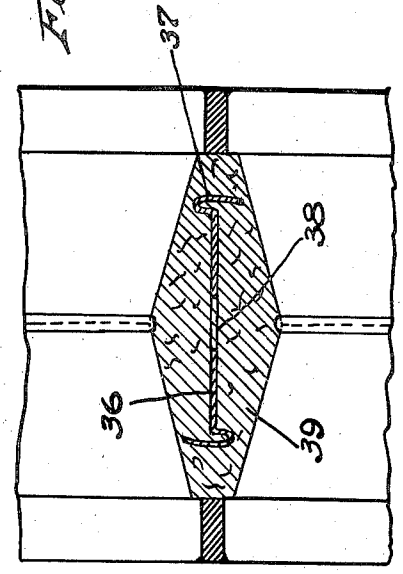


Fig. 3.

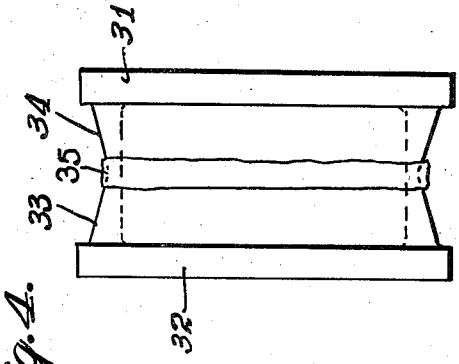


Fig. 4.

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Fig. 2.

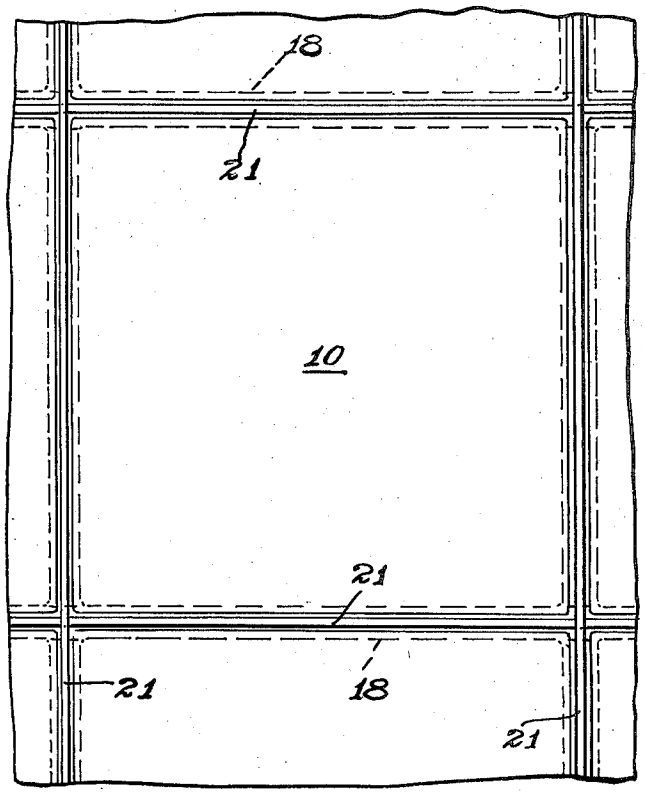
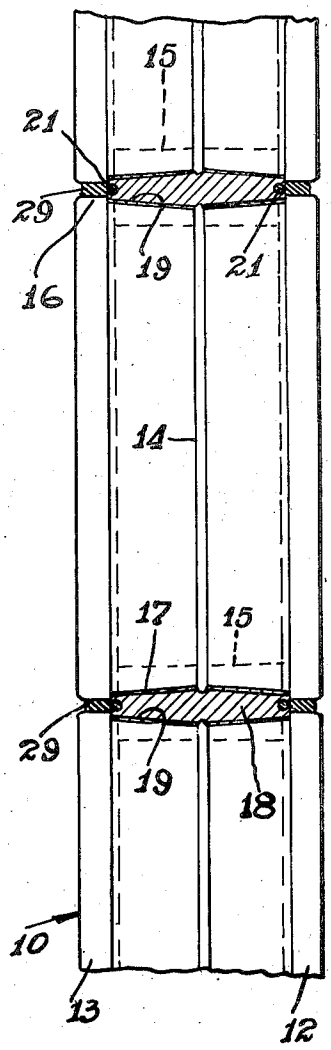


Fig. 3.



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BLOCK MOUNTING

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Application March 25, 1939, Serial No. 264,151

3 Claims. (Cl. 72—42)

The present invention relates to the mounting of structural blocks in building walls and it has particular relation to the mounting of hollow blocks of glass, or similar materials in such structures.

One object of the invention is to provide a mounting for glass blocks in building walls which is simple, inexpensive, and which admits of assembly of the blocks into a wall by relatively unskilled labor.

A second object of the invention is to provide a mounting for glass blocks in building walls which cushions the blocks and permits expansion and contraction without subjecting the blocks to excessive strains and which enhances the rigidity of the wall against forces exerted perpendicularly thereto.

A third object of the invention is to provide a mounting of the foregoing type which is nonconductive to heat and provides an effective barrier against the entrance of moisture between the blocks.

These and other objects of the invention will be apparent from the consideration of the following specification and the appended claims.

In an endeavor to provide a building material which would permit the entrance of light into buildings embodying such material and which at the same time would be relatively resistant to the transmission of heat, it has heretofore been proposed to provide hollow blocks of glass embodying channels extending peripherally about the edges thereto to receive a suitable keying and bonding material, such as mortar between adjacent blocks. Such blocks have been prepared by forming complementary dish-like halves by pressing molten glass in suitable molds and then securing the lips of the halves together in order to provide a hollow block. Convenient methods of securing the halves involves heating the lips approximately to the fusing or sintering temperature and then pressing them together, or juxtaposing the lips and then applying molten metal or solder thereto, to provide a bond.

In the assembly of these blocks into building wall or similar structure, the edges of the blocks were juxtaposed and the peripheral channels or grooves were filled with a suitable bonding material, such as a conventional mortar or cement, which provided a key between the edges and thus prevented displacement of the adjacent blocks. However, in conventional types of construction considerable difficulty was encountered. For example, it was found necessary to employ skilled labor in a setting of the blocks. Also conventional types of mortar tended to attack or corrode the contiguous material. This was particularly true where blocks having a seal of metal between the halves were employed. The alkalies in the cement very strongly attack the metal and often produce failure thereof. Moreover, the mortar, after it had set, had a substantially different coefficient of thermal expansion than the adjacent glass, and it was also very hard and non-yielding. As a result, cracking of the blocks often result. Furthermore, the mortars were permeable to moisture or water and in event of partial failure of one of the blocks, moisture would enter the latter and would produce objectionable staining and condensation therewithin.

Furthermore, keys of mortar between glass blocks were very low in resistance to tension and therefore were but poorly designed to resist forces applied vertically to the wall and tending to produce bending moments therein. Therefore, walls embodying the blocks were relatively low in strength and large panels free of supporting framework were not feasible.

The present invention involves as one feature the provision of a bar of fibrous, yieldable material suitable for mounting between the contiguous edges of glass blocks in a building wall, in order to provide a reinforcing and sealing member for the joints in the wall. According to the invention these bars may be impregnated with a waterproofing and bonding material, such as asphalt or the like, and they may also be reinforced by means of wires or bars of steel or other suitable material in order so to increase their resistance to bending as to provide a reinforcing grill in a wall embodying them.

For a better understanding of the invention reference may now be had to the accompanying drawings in which

Figure 1 is a fragmentary cross-sectional view taken in the plane of the joint between contiguous rows of blocks.

Figure 2 is a fragmentary side view of a portion of a wall embodying the invention.

Figure 3 is an end view of a fragment of a wall embodying the invention.

Figure 4 is a fragmentary edge view of a modified form of building block to which the invention may be applied.

Figure 5 is a cross-sectional view of a modified form of reinforcing and sealing strip suitable for use in practicing the invention.

In the drawings like numerals refer to like parts throughout.

In the form of the invention illustrated in

Figs. 1, 2 and 3, a wall 10 is constructed of hollow glass building blocks 11 of conventional design including opposed halves 12 and 13 (best shown in Fig. 3) which halves may be formed by pressing molten glass in molds or by other convenient methods. The halves are joined together in a thickened rib-like weld 14 in the median plane of the block by pressing together the edges of the side walls 15 thereof while they are heated to the temperature of softening. The blocks, also usually include peripherally-extending flanges or shoulders 16 which provide a groove or channel 17 about the blocks.

A member suitable for filling and sealing the space between the edges of contiguous blocks may comprise a strip 18 of cross-sectional form approximately corresponding to that of the channel 17. These strips, preferably, are formed of fibrous material, such as bagasse fibers, asbestos fibers, wood pulp, or the like, compressed and compacted into an elongated bar of approximately the same cross-sectional dimensions as the space between two adjacent blocks. The bars are also impregnated with a plastic or yieldable bonding agent, such as asphalt, rubber, a synthetic resin of the type of Bakelite, petroleum resins, or a drying oil, such as linseed oil. Impregnation may be effected by application of the bonding agent in liquid state (i. e. molten, or dissolved in a solvent), under suitable pressure. The bars may also include coatings or facings 19 of asphalt or the like designed to provide an adhesive face layer for contact with the surface of the glass. The bars may further be stiffened by incorporation preferably at the margins thereof of longitudinally-extending rods 21 which may be of iron, steel, brass, or the like.

In the assembly of a wall embodying the bars as sealing members, the blocks are simply arranged in rows in accordance with the common practice. Certain of the sealing and reinforcing bars, e. g. those extending in the direction of the greatest width of the wall, may be cut into sections of the length approximately corresponding to the width of the blocks and inserted between adjacent blocks. Usually these short sections need not include the reinforcements 21. It is desirable in order to enhance the reinforcing action of the bars that those extending transversely of the first-mentioned bars be continuous throughout their length. Preferably these continuous bars extend in the direction of the shortest dimension of the wall. For example, if the wall is wider than it is high they may extend vertically. However, if the width of the wall is not too great they may also extend longitudinally.

As shown in Figure 1 the blocks may be assembled in a suitable chase or form 22, which may comprise I beams or channel irons disposed about a panel or blocks and including a web portion 23 and flanges 24, the latter of which overlap the marginal portions of the faces of the blocks. The spaces between the channel iron 23 and the blocks may be suitably packed with a layer 26 of resilient material, such as cork, asbestos, bagasse fibers, or the like.

The reinforcing rods 21 may be secured to the web 23 of the channel iron in any convenient way, for example, by welding or by providing projecting end portions 27 extending through suitable openings in the web and being provided externally of the channel with nuts or heads 28, which may be threaded thereupon. The nuts may be tightened to put the rods under tension and the rods may carry all or a portion of the weight of the blocks upon them.

The longitudinal and transverse rods may, also, be prewelded into a grid or grill having interstices corresponding to the cracks or joints between blocks. Such grid is mounted after the wall has been assembled, merely by placing it against the wall with the rods in register with the joints. Subsequently the rods are forced into the joints and are then covered with mastic.

In the assembly of the wall structure the impregnating material or the surface of the impregnating material in the bars may be suitably softened, for example by preliminary heating the bars, or by heating the glass which is to contact therewith. The latter operation may be effected by dipping the blocks preliminary to assembly in a wall in warm water or other medium. Upon contact of the surfaces, adhesion is effected, which enhances the strength of the wall and also provides a water and moisture-proof seal between the surfaces. Adhesion of the surface of the sealing and reinforcing bars to the glass may, also, be effected by wetting of the surface of the bars with a softening agent such as benzene or the like, which in time evaporates.

The seal between the glass blocks may further be increased by injection of a caulking material between contiguous shoulders 13. Such caulking material may comprise a mixture of whiting or finely-divided calcium carbonate and a bonding agent, such as linseed oil, asphalt, or the like. The caulking material of course is injected or pressed into the opening between the blocks while in a plastic condition. Upon hardening it provides a permanent seal between the blocks. Aluminum powder mixed with asbestos and bonded with linseed oil is also highly satisfactory as a mastic.

In a wall structure embodying the invention, the strips 18 provide a seal between the glass blocks. By reason of the fibrous nature of the members 18, a certain amount of resiliency and cushioning action is inherent in the structure which permits the wall to yield under sudden impacts, or under thermal changes without any substantial tendency to exert excessive strains on the blocks themselves. However, in addition to providing a seal, the bars act as keys and bonds between adjacent blocks, positively to prevent displacement thereof. The members, where continuous in one direction, provide a reinforcing grid or grill structure which enhances the resistance of the wall to thrusts exerted perpendicularly thereto. This is particularly true in structures embodying reinforcing rods or wires 21.

The sealing and reinforcing members constituting the subject matter of the present invention are also excellently adapted for use in connection with glass blocks embodying a metallic seal or bond between adjacent halves. A block of the latter type is illustrated in Figure 4. Such blocks comprise two halves 31 and 32 including flanges or edge walls 33 and 34, which have their lips juxtaposed and bonded together by means of a layer 35 of solder or the like. Heretofore, it has been found difficult to obtain a completely satisfactory bond of the solder layer to the glass. Under the conditions of service, the solder tended to loosen from the glass and thus permitted the entrance of moisture into the blocks. Also conventional cements heretofore employed for securing contiguous blocks together has been

found seriously to corrode the solder. Where the blocks are assembled with the strips or bars embodying the present invention, the liklihood of failure of the bond between the metal and the glass is substantially reduced by reason of the reduction in stresses placed upon the blocks created by differential expansion between the glass and the bonding medium about the blocks. Likewise the material constituting the bars employed in practicing the present invention does not attack the metal with which it is in contact. Assuming that under extraordinary conditions partial failure of the bond between the glass and the metal does occur, it will be apparent that the sealing strips or bars effectively enclose and seal the portions which have failed and thus prevent the entrance of water into the units.

In Figure 5 is shown a modified form of bar which includes a reinforcing plate 36 of iron, steel, or other metal, which may be of the same width as the bars themselves, or as shown in the drawings may be of lesser width. Also, the reinforcing strip may be provided near its edges with ribs 37 designed to increase the stiffness thereof. Holes or openings 38 may be formed in the bars and are designed to reduce the transmission of heat through the metal. The reinforcing bar 36 is suitably embedded in body 39 of fibrous material, opposite sides of which may be joined together through the openings 38, in order to insure the adequate bonding of the body about the metal. The covering layers preferably are formed to a cross-sectional contour corresponding to that of the space between contiguous glass blocks.

The forms of the invention herein shown and illustrated are to be considered merely as exemplary. It will be apparent to those skilled in the art that numerous modifications may be made therein without departure from the spirit of the invention or the scope of the appended claims.

What I claim is:

1. A wall construction composed of glass blocks having peripheral shoulders providing channels about the peripheries thereof, said blocks being laid in horizontal superposed rows, a combined reinforcing and sealing bar being disposed between each pair of contiguous rows, said bars being formed of a fibrous material reinforced with a plastic substance and having metallic reinforcements embedded in the edge portions thereof, said bars being of a length sufficient to extend from side to side of the wall structure and being shaped to fit the edge contours of the blocks.

2. A construction as defined in claim 1 in which the reinforcements comprise spaced wires embedded in the edge portions of the bars.

3. A construction as defined in claim 1 in which the reinforcements comprise straps of metal having portions intermediate the edges cut out and the plastic and fibrous material on one side being bonded through the cut-out portions to that on the other side of the reinforcement, the edge portions of the straps being adjacent to the edges of the bars.

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