July 14, 1936. B. J. POLLARD 2,047,648

BUILDING STRUCTURE

Filed April 1, 1932

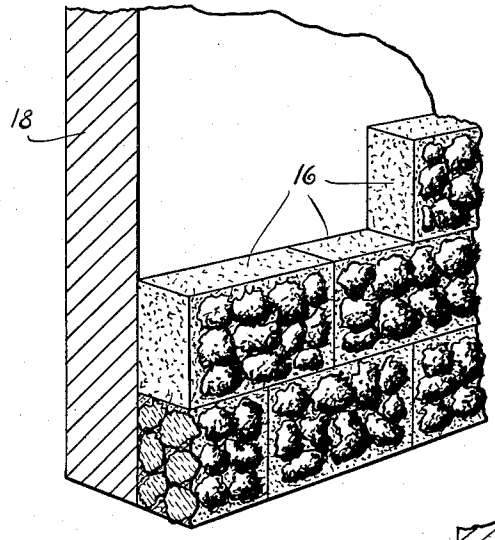


Fig. 2

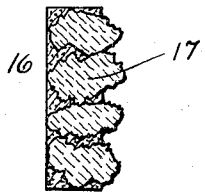


Fig. 4

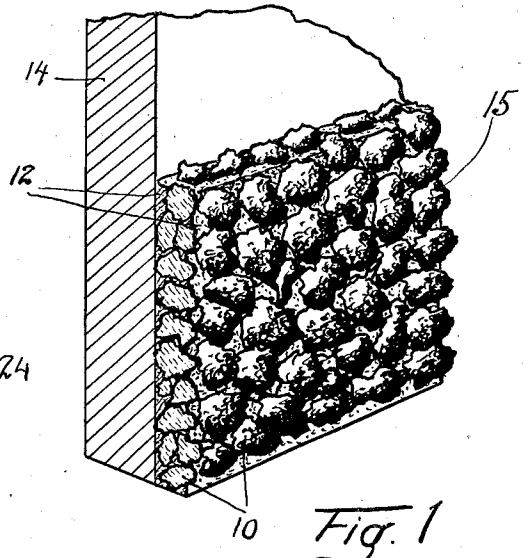


Fig. 1

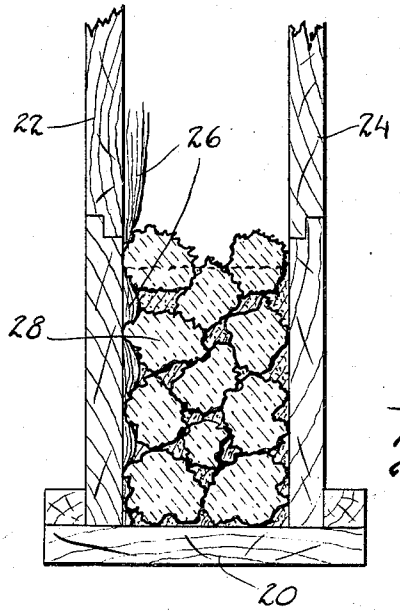


Fig. 3

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BUILDING STRUCTURE

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Application April 1, 1932, Serial No. 602,509

1 Claim. (Cl. 72—37)

My invention relates to building structure and has particular reference to the formation of walls having great resistance to moisture seepage and consequent cracking and disintegration.

An object of the invention is to provide a building wall composed of materials having substantially the same co-efficient of contraction and expansion whereby cracking of the integral structure will be substantially eliminated. In carrying out this important object I contemplate utilizing cinders of a size larger than those hitherto utilized for aggregate and associating therewith for bonding purposes a cinder mortar. In this way a substantially homogeneous integral structure may be built up which will contract and expand more or less as a unit with changing temperature, thereby minimizing disintegration by reason of cracking and subsequent seepage of moisture.

A further object of the invention is to provide a wall possessing great tensile strength. Such a wall is particularly adapted for use in conjunction with veneer work and for garden wall or fencing purposes.

Yet another object of the invention is to provide a decorative veneer wall of attractive and unusual appearance which may be inexpensively built and is of a durable nature.

A further improved feature of the invention resides in a novel method of pouring walls whereby the exterior faces of the aggregate utilized are left free and clear of the bonding element. In this way the decorative features of the aggregate are retained on the exterior faces of the wall structure while at the same time the wall is built in the most inexpensive and rapid fashion known in the trade.

Referring now to the drawing wherein like numerals represent similar parts throughout the several figures,

Fig. 1 illustrates in perspective one form of my improved wall,

Fig. 2 illustrates a somewhat modified form,

Fig. 3 is a section through a wall during the process of pouring the same, and

Fig. 4 is a section through one of the blocks.

Hitherto cinders have been utilized in building structures in various ways, primarily in the form of cinder blocks wherein aggregate of relatively small size is screened to maintain certain size limits. Such blocks include a relatively large proportion of cement in relation to the cinder aggregate utilized and are necessarily subject to sufficient expansion and contraction with temperature changes to produce cracking. Cinder blocks are a substantial improvement over concrete construction insofar as cracking is concerned.

In one form of wall I propose to utilize cinders of relatively large size, the size being comparable to that of the ordinary building brick, and bonding the same together, in the same manner as brick or stone walls are bonded, with cinder mortar.

In Figure 1 a wall wherein the cinder or clinker aggregate 10 has been laid individually, as bricks would be laid, is illustrated. The bonding material 12 is mortar having fine cinder aggregate for the purpose of providing a co-efficient of expansion in the mortar substantially equal to that of the large aggregate used. The wall in Figure 1 constitutes a veneer overlying a foundation wall 14 and, as illustrated at 15, the outer faces of the cinder aggregate form a rough exterior of rustic appearance, the decorative effect of which can only be appreciated by viewing the actual structure.

As is well known, cinders or clinkers are the non-combustible residue of solid fuel which has been completely burned and, depending upon the type of fuel utilized, the cinders are of varying colors and hues. The colors found in such clinker or cinder are fast and lasting and the peculiar physical characteristics of such aggregate render it possible for the architect or builder to produce a variety of effects—a spot of color, a mass of color, a rough cast wall, or an insert which cannot well be produced in any other way.

An important characteristic of a wall structure composed of the material heretofore described resides in the great heat and sound insulating qualities derived from the porous nature of the clinker, as well as in the great tensile strength inherent in the wall by reason of the firm bond between the cinder mortar and the porous surfaces of the clinkers. The interior of the individual clinkers or cinders is full of voids that are created by the burning of the fuel from which the clinker was formed. These voids are full of mixed gas and air and constitute a very effective insulator against heat and sound.

Another form in which the large cinder aggregate may be utilized is illustrated in Figure 2 wherein the aggregate has been molded into blocks 16, which blocks are subsequently laid either as a wall proper or as a veneer against a background 18. These blocks are preferably molded individually and one method of so molding them is to pour a certain amount of cinder mortar in the mold box, and subsequently fill the

box with the cinder aggregate prior to hardening of the mortar. It is important that the aggregate utilized be of a greater depth than that of the poured mortar so that the exterior surfaces of the cinder aggregate will project beyond the mortar to expose the decorative faces thereof. The lower left block in Figure 2 illustrates more clearly the internal structure of the block and it will be apparent that the large cinder aggregate is utilized not only for the exterior face of the block but constitutes the major body portion of the block body. The mortar utilized is only for the purpose of bonding the aggregate together and is not designed to form any substantial portion of the block proper.

The block illustrated in Figure 4 utilizes only a single layer **17** of clinker aggregate and is adapted primarily for veneer work where no load need be carried by the block.

By reason of the porosity of such aggregate walls may be poured therefrom with great success. An important feature of my improved pouring operation resides in the manner whereby the exterior faces of the clinker are shielded from the bonding material or mortar which is poured along with the aggregate to preserve the decorative effect thereof. In Figure 3 a wooden form comprising a base **20** and side walls **22** and **24** is utilized for the pouring operation. The inner faces of the side walls **22** and **24** are lined with some yieldable substance **26** such as straw prior to the pouring of the material. While straw constitutes one available substance for this purpose, it has been found that mud serves the purpose admirably and will crack when dried, falling off and leaving the exposed aggregate surfaces. A large size cinder aggregate **28** and mortar are poured successively. A layer of mortar follows each layer of aggregate, the preceding layer of mortar being forced down between the voids around the under layer of aggregate as each succeeding layer of aggregate is poured thereon. The outer faces of the aggregate will imbed themselves in the soft yieldable lining **26** of the form walls and this lining will constitute a protective coating preventing the mortar from flowing over the said exterior surfaces.

When the form is removed, after the mortar has set properly, the lining material for the most part will be drawn away with the walls thereof and any portion which sticks to the exterior faces of the cinder aggregate may be easily removed, leaving the decorative body of the aggregate projecting. Such a wall possesses all of the attractive and desirable characteristics of a wall wherein the aggregate is laid individually by hand. The irregularity of the surface contour of the clinkers or cinder aggregate assists materially in providing a strong tensile bond therebetween, such tensile bond being enhanced greatly by virtue also of the porosity of the aggregate. A durable interlocking assembly of substantially homogeneous material results from either the pouring operation, the block formation, or the individually laid clinker.

To secure further decorative effect a slight amount of coloring material may be utilized in the mortar without in any way adversely affecting the bond secured between the clinker aggregate, or a wash of color material may be applied to the exterior surface of the mortar following the bond lines around the outer surfaces of the clinker.

By reason of the porosity inherent in the clinker aggregate the use of air vents in veneer walls for insulation purposes may be substantially eliminated. Furthermore, walls built in the manner hitherto described remain intact over a long period of time without the possibility of individual clinkers falling out, as is almost invariably the case with walls built up from cobblestones or other aggregate having a smooth surface which will not permit as strong a bond as the porous aggregate herein utilized.

A very effective structure may be secured for veneer purposes by utilizing a fine graded clinker which produces somewhat the same effect as stucco or pebble-dash without risking the deterioration invariably caused by the contraction and expansion of such stucco work.

While various other forms of structure embodying the principles of my invention may readily be devised, I wish to be limited as to scope only by the appended claim.

I claim:

A decorative structural wall possessing heat and sound insulative qualities comprising irregular cinder aggregate of a size comparable to that of ordinary building brick bonded together throughout with cinder mortar and constituting substantially over fifty per cent of the total volume of the wall, said cinder aggregate containing a multiplicity of closed and gas filled voids providing heat and sound insulating qualities, said cinder mortar confined within the plane of the exterior surface of the wall so that the exterior surface of the cinder aggregate projects beyond the mortar to expose the decorative surfaces thereof, said irregular exposed protruding portions of the large cinders being uncovered and entirely free of cinder mortar and constituting substantially over fifty per cent of the outer exposed surface of the wall.

BERNARD J. POLLARD.