Aug. 23, 1938. C. A. HADLAND 2,127,914

COMPOSITION BUILDING BLOCK

Filed Dec. 24, 1936

Fig. 1

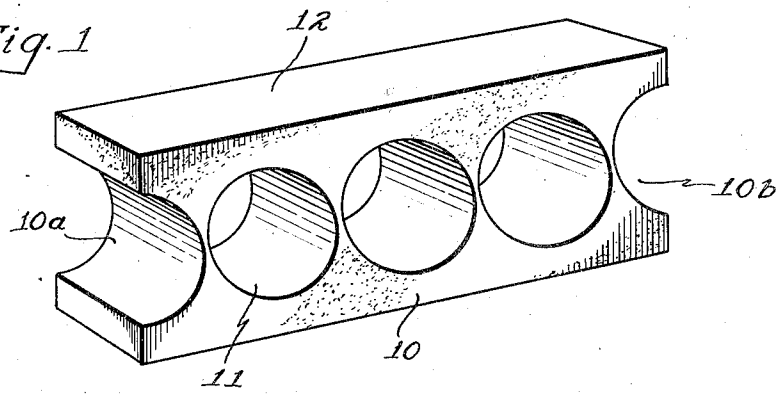


Fig. 4

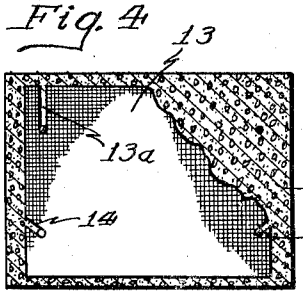
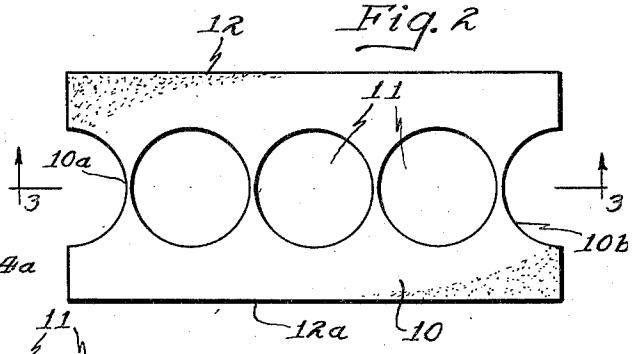


Fig. 2



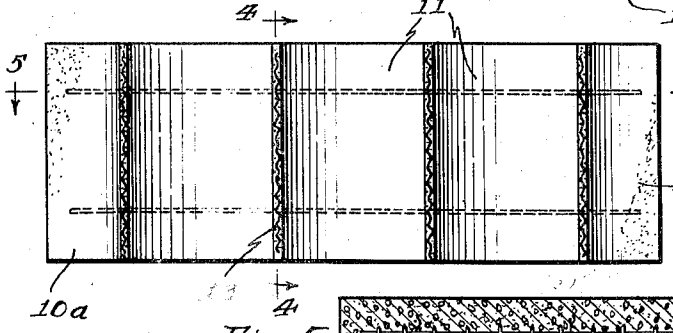


Fig. 3

Fig. 5.

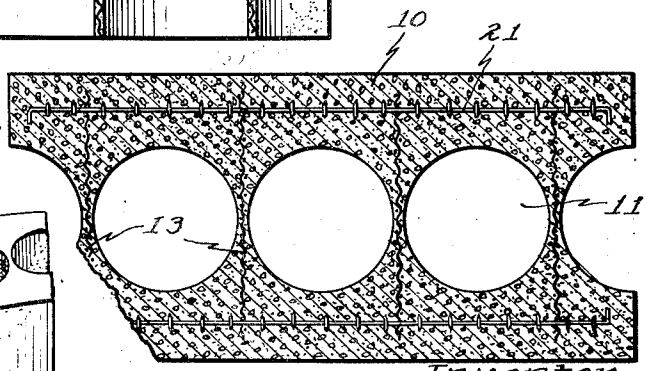
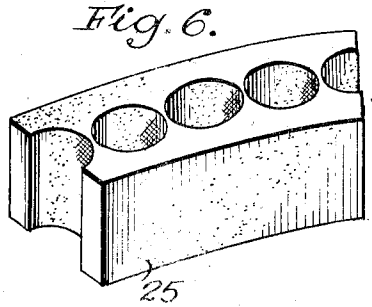


Fig. 6.



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COMPOSITION BUILDING BLOCK

Carl A. Hadland, Leon, Wis.

Application December 24, 1936, Serial No. 117,453

8 Claims. (Cl. 72—42)

My invention is directed to a composition building block adapted to be mounted, cast and formed from a cementitious or plastic mixture of cement, sand and other suitable materials now known as being suitable for use individually in connection of the building trades, and more particularly is directed to a special and novel moulded vertically apertured composition block having as a part thereof and having embedded therein a plurality of transverse reinforcing metal plates, cores or members and a plurality of longitudinally extending reinforcing bars or metal strands also embedded therein along or a short distance from the opposite side surfaces of the block.

An important object of my invention is the provision of a moulded composition building vertically apertured block of relatively light but strong construction, having a plurality of transversely extending metal reinforcing plates therein, certain of said embedded plates transversing the block between the adjacent vertical holes or passages through the block and also having a plurality of longitudinally extending metal bars or irregularly shaped wire strands embedded therein a short distance from the outer surfaces of the block, said bars or strands intersecting and passing through said transverse reinforcing members.

A further object of my invention is the provision of a vertically apertured building block having a plurality of transverse as well as longitudinal reinforcing metal members embedded therein, said members being in intersecting relation, and said longitudinal reinforcing members extending substantially from end to end of the block and lying in peripherally opening recesses formed in said transverse reinforcing members.

A further object of my invention is the provision of a cast composition building block, and of the method of forming the same, which block has three or more longitudinally aligned vertical apertures therethrough and arcuate end recesses therein, and having a plurality of transversely extending reinforcing metal fabric members in substantially vertical planes and each of said members being embedded and lying between each pair of adjacent apertures and between the end apertures and the arcuate end recesses and having a plurality of embedded reinforcing metal wire strands intersecting said metal fabric members on opposite sides of said vertical apertures.

A further object of my invention is the provision of an inexpensive and economical method of casting and forming said blocks and of the quick, practical and inexpensive setting up or mounting of the cores and the reinforcing transverse and longitudinal members so that the same will retain the desired position in the pouring and casting operation, and of the further object of providing a novel, inexpensive mould or form for casting said block in the desired shape.

A further object of my invention is the provision of a concrete or composition building block adapted for use in silos or other walls wherein it is important that an insulated and heat and cold resistant wall be provided, and wherein said block has a plurality of superposed blocks having vertical passageways or channels to permit an insulating material to be placed therein, and which at the same time has both transverse and longitudinal embedded reinforcing members.

A further object of my invention is the provision of a composition building block of triangular vertical section embedded for placement adjacent to the roofs and having embedded therein transverse metal fabric plates and longitudinal reinforcing strands and also having embedded a portion of a suitable anchored bolt.

Other and further objects of my invention will be apparent or recited in the following specification and claims.

This invention (in the preferred form only) is illustrated and described in the following specification.

As shown on the drawing:

Fig. 1 is a perspective view of the finished composition block of the first preferred form of my invention.

Fig. 2 is a top plan view of said block showing the vertical apertures or passageways therethrough.

Fig. 3 is a cross sectional view of the block taken on line 3—3 of Fig. 2.

Fig. 4 is a cross sectional view of the block taken on line 4—4 of Fig. 3.

Fig. 5 is a horizontal cross sectional view of the preferred form of building block.

Fig. 6 is a perspective view of the block with curved longitudinal sides.

Referring to the principal and first preferred form of block illustrated in Figs. 1 to 5 inclusive, numeral 10 indicates the block as a whole, substantially rectangular in this preferred form in general outline, except, however, arcuate semi-circular recessed ends 10*a* and 10*b*, as clearly shown in Figs. 1 and 2, a plurality of circular holes or apertures or passageways 11, preferably three in number, are formed in the block 10 and are in longitudinal aligned position. Said cylindrical holes or apertures have an important function of reducing the weight and cost of the block as well as providing an air space within the block and within the wall constructed forming superposed blocks. The block 10 has opposite inner and outer vertical substantially flat surfaces 12 and 12*a* which may be made of any one or more of a number of known shapes and finishes, as for example a stucco-like corrugated surface or in simulation of other known building

units used in building walls, all according to the desired effect and design desired.

Extending transversely across the block are a plurality of reinforcing metal fabric members or plates indicated by reference numeral **13**, and which may be of either wire mesh or wire fabric construction or of foraminated rectangular plates. Each of the reinforcing fabric members or plates **13** has a pair of vertically extending upwardly opening peripheral recesses **13***a* which are a short distance from the opposite side edges of the numeral 13. As illustrated in Fig. 4, it also has on the opposite side edges respectively a pair of diagonally extending recesses **14** and **14***a* respectively, in the positions as clearly shown therein.

It is to be noted that the respective reinforcing members or plates **13** are disposed and embedded in vertical position in the block **10** and lie between the respective circular apertures **11** and between said apertures and concave end recesses **10***a* and **10***b* and form the principal connecting and reinforcing means for the opposite halfs of the block.

Hollow substantially semi-cylindrical metal end cores are placed in position at the opposite ends of the moulding box and with the flat side thereof against the ends of the box in the forming of the block.

In preparing the mould, whether it be a single unit or a multiple gang of adjacent units, a flat bottom plate is first placed upon a suitable flat surface and thence bottom plates not shown are placed in spaced apart relation to locate where the vertical holes in the block are desired and thereafter suitable side panels are placed in vertical position and assembled and attached together.

As it may be desirable in some instances to make blocks having suitably bevelled corners, suitable moulding strips may be properly secured by nails or the like to the inner surface of the side panels, said mould strips being in a position to fill the corners of the assembled form. It is obvious that the use of such strips will result in the formation of corresponding uniform bevelled edges or corners on the completed block.

The cylindrical cores used may be varied in size or even shape, and a core may be used of a size which will contact the respective transverse plates **13** on diametrically opposite sides, with the result that the two longitudinal sections of the block are connected together solely by transverse plates **13**, this preventing frost from creeping from the outside to the inside portion of the block.

After the form has been assembled in the manner desired and the cores positioned, the transverse reinforcing fabric members or plates **13** are inserted in vertical position between the respective cores and thence a plurality, preferably four, of metal bars or wire sections, are quickly and easily inserted into the respective slots **13***a* and **14**, namely in the corresponding and aligned slots of all said transverse fabric plates **13**. The preferred form of wire strands or sections which I employ are ordinary barbed wire having the usual barbs in spaced apart relation thereon and the ends of each of said metal wire strands or sections are preferably, though not necessarily bent angularly to terminate a short distance from the respective ends of the building block, substantially in the manner illustrated in Figs. 5 and 6. It will be noted that the position and depth of the slots **13***a* and **14** is such as to position said wire strands, sections or bars **21** well within the block and substantially mid-way between the outer surface thereof and the circular holes which pass through it. It will be further apparent that the inclined position of slots **14** and **14***a* have a very definite and material advantage in permitting convenient and inexpensive mounting of the lower pair of longitudinal wire strands **21** and that the same will be held in the proper position during the pouring and casting operation.

The mixed concrete or other suitable cementitious composition is made of the proper and desirable consistency and poured into the form, whether it be a singular form unit or a gang thereof and the poured material may, if desired, be tamped to eliminate undesirable air cavities in the finished block. In the finished form the top surface is of course leveled off with a trowel in a conventional manner and the poured block is allowed to set until sufficiently rigid to permit the removal of the cores and the plates and parts of the form itself. In this it is important that the hollow cylindrical and semi-cylindrical cores should be removed before the poured material has set for too long a time and as soon as it is capable of maintaining its shape, as otherwise the said cores would be difficult to remove at a later time.

With the block formed in the described manner, the transverse reinforcing plates or fabric members **13** provide a very rigid connection which absorbs and overcomes vertical as well as horizontal stresses to which the block is subjected, and that the intersecting longitudinally extending strands or bars **21** function to band together and hold in position the respective sections of the block, including the corner sections, which sections are partly but not totally separated by the transverse vertical plates or members **13**. While the apertures through the respective members or plates **13** permit a bonding and forming of the block as an integral unit, the said longitudinal barbed wire strands materially strengthen the block and make it suitable for use where substantially heavy vertical, horizontal and angular stresses are to be overcome.

An important feature of my invention is that the shape, area and proportions of the block may be varied to fulfill the particular use for which it is desired and that the same may be made relatively large and still be of a size and construction permitting convenient handling.

One of the modified forms of the moulded building block is illustrated in Fig. 6. In this form the block is arcuate with non-parallel ends and curved side surfaces. This form of block is required particularly for the building of silos or other curved wall sections wherein a substantially strong wall is necessary and wherein a cold impervious insulated wall is desirable. The block of this arcuate curved shape is made by the same method as hereinbefore described with reference to the block of rectangular, horizontal cross-section, except that the side plates or panels of the mould are curved and are assembled with similar end plates. In preparing the "skeleton" or reinforcing members in making this form of block, the metal reinforcing wire sections or bars **21** are substantially curved so as to maintain the same an equal distance from the curved vertical surfaces of the form and the finished block.

It will be noted that the respective forms of reinforced building block which I have illustrated and described all include the basic features of my invention and that the difference between them is merely in shape, size and curvature, and that other variations and modifications of shape, size,

proportion and curvature might be made embodying the basic features of my invention.

Various changes may be made in the embodiment of the invention herein specifically described without departing from or sacrificing any of the advantages of the invention or any features thereof, and nothing herein shall be construed as limitations upon the invention, its concept or structural embodiment as to the whole or any part thereof except as defined in the appended claims.

I claim as my invention:

1. A composition building block having a plurality of vertically disposed substantially annular vertical passageways therethrough and having semi-circular recesses at the opposite ends thereof; a plurality of spaced apart vertically disposed transversely extending re-inforcing plates, each of said plates having a recess opening on the opposite side edges and a pair of spaced apart recesses opening at the upper edge thereof, the corresponding recesses of the different plates being in substantial alignment, one of said plates extending across said block between each pair of adjacent apertures and between the end apertures and the adjacent end recesses respectively; and a plurality of metal bars embedded in said block longitudinally therein, each of said metal bars being mounted and passing through the corresponding recesses of said plates.

2. A composition building block having a plurality of vertically disposed substantially annular vertical passageways therethrough and having semi-circular recesses at the opposite ends thereof; a plurality of spaced apart vertically disposed transversely extending re-inforcing plates, one of said plates extending across said block between each pair of adjacent apertures and between the end apertures and the adjacent end circular recesses respectively each of said plates having correspondingly located recesses therein; a plurality of re-inforcing irregularly shaped metal sections mounted in and passing through said recesses and embedded in said block in intersecting relation with said transverse re-inforcing plates each of said metal sections having a plurality of projecting elements thereon embedded in said block.

3. A concrete composition building block having semi-circular end recesses therein and a plurality of aligned vertical relatively large apertures therein dividing said block into integral sections; a plurality of metal screen transverse spaced apart reinforcing members embedded in said block, said reinforcing members being between adjacent apertures and between the end apertures and the respective end recesses of said block, said reinforcing screen members having peripherally opening recesses on their opposite side edges respectively; and a plurality of longitudinally extending irregularly shaped reinforcing metal strands embedded in each section of said block longitudinally thereof, said strands passing through said peripheral recesses of said transverse screen members.

4. A composition building block having a plurality of vertically disposed substantially annular vertical passageways therethrough and having semi-circular recesses at the opposite ends thereof; a plurality of spaced apart vertically disposed transversely extending reinforcing metal fabric panels, one of said fabric panels extending across said block between each pair of adjacent apertures and between the end apertures and the adjacent end circular recesses respectively; and a plurality of reinforcing twisted wire strands embedded in said block in intersecting relation with and passing through said transverse reinforcing fabric panels, the ends of said wire strands being bent angularly and a plurality of projecting anchoring elements on said wire strands embedded in the composition material of said block.

5. A composition building block having a plurality of vertically disposed substantially annular vertical passageways therethrough and having semi-circular recesses at the opposite ends thereof; a plurality of spaced apart vertically disposed transversely extending reinforcing metal fabric panels, one of said fabric panels extending across said block between each pair of adjacent apertures and between the end apertures and the adjacent end circular recesses respectively; the peripheral edges of said fabric panels terminating substantially flush with the exterior surfaces of the block; and a plurality of reinforcing twisted wire strands embedded in said block in intersecting relation with and passing through said transverse reinforcing fabric panels, the ends of said wire strands being bent angularly.

6. A composition building block of substantially rectangular vertical section having a plurality of aligned vertical apertures therethrough and vertical end recesses; a plurality of transversely extending metal reinforcing fabric elements embedded in said block, certain of said reinforcing fabric elements being disposed between the respective adjacent vertical apertures in said block; said metal reinforcing elements having a pair of upwardly opening recesses in its upper edge and a pair of recesses in its opposite side edges respectively, the peripheral recesses of the respective fabric elements being in substantially longitudinal alignment; and a plurality of reinforcing metal wires embedded in said block and extending longitudinally with respect thereto, said wires passing through said aligned peripheral recesses of said transverse reinforcing elements and having their ends bent angularly.

7. A concrete building block having four vertical side surfaces and a top and bottom surface, the end surfaces being in non-parallel planes and the side surfaces being arcuate, and having a plurality of substantially circular vertical passageways; a plurality of metal reinforcing fabric members embedded in said block in non-parallel relation, said reinforcing members having a plurality of peripheral substantially aligned recesses; and a plurality of longitudinally extending reinforcing barbed wire strands embedded in said block and passing through said recesses and intersecting said transverse reinforcing members.

8. A composition block of substantially rectangular cross section having semi-cylindrical recesses in its ends forming bifurcated ends; a metal reinforcing element embedded in said block substantially adjacent one of said semi-circular vertical recesses and connecting said sections together; and a metal reinforcing element embedded across the opposite end of said block and connecting said sections together and traversing the bifurcated end.

CARL A. HADLAND.