Jan. 2, 1940. A. C. FISCHER 2,185,335

STRUCTURAL MEMBER

Filed April 5, 1937

Fig. 1.

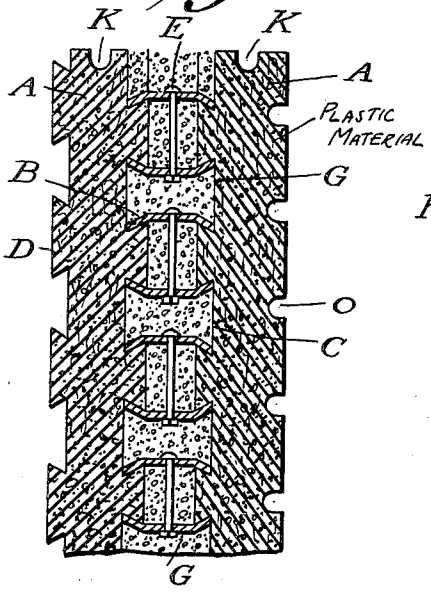


Fig. 1a.

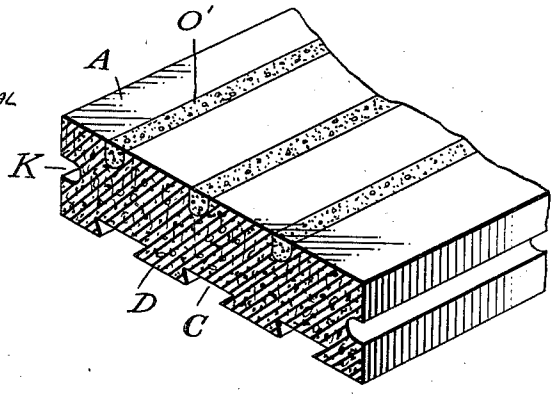


Fig. 1b.

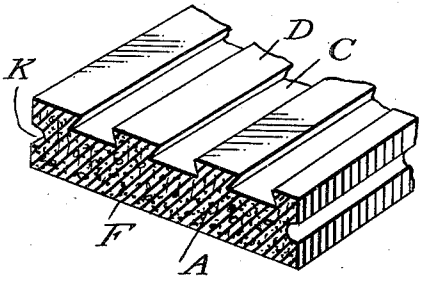


Fig. 2.

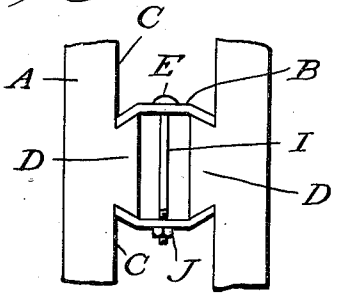


Fig. 3.

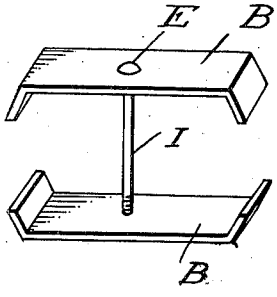


Fig. 4.

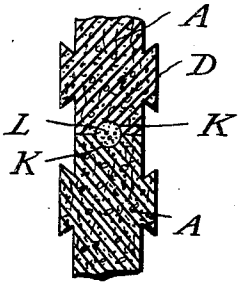
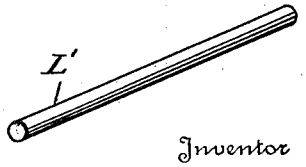


Fig. 4a.



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UNITED STATES PATENT OFFICE

2,185,335

STRUCTURAL MEMBER

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Application April 5, 1937, Serial No. 135,139

13 Claims. (Cl. 72—44)

This invention relates to structural members and more particularly to a wall construction having as a constituent part thereof plastic, elastic or mastic slabs or plates.

It is the object of the present invention to provide a self-sustaining and reenforced wall construction composed of plastic strips which may be formed under heat and which harden upon setting. The preformed material may fall into that class of compositions usually employed in the production of what is known as asphalt plank. The invention is concerned with the reenforcing of structural plates and walls formed therefrom in order to obviate the objections to the use of this material in such applications by virtue of its plastic character and its liability to permanent deformations when subjected to stress. The invention contemplates the handling of strips, plates or slabs formed of bituminous material, fiber and mineral matter, which may be extruded or pressed to form.

It is the object of the present invention to utilize a structural member formed of a plastic material which is subject to cold flow and distortion either singly or in pairs to obtain a structure which is sufficiently strong and rigid and which possesses the advantages inherent in the use of plastic materials of this nature. In the realization of my invention, grooves or recesses in the form of keyways are formed on one or more surfaces of the structural plate and these are filled with a hardenable cementitious mixture in order to reenforce the same. These grooves preferably extend in a direction transverse to that of the stress imposed upon the structural member, which in effect serves to subdivide the mass of plastic medium subject to distortion by the load stresses, thereby rendering it strong and self-sustaining. The grooves may take such form as to attain particular results in addition to realizing reenforcing benefits. Thus, in a wall construction embodying a facing exposed to the exterior, these grooves may be simply semi-circular in cross-section and may be filled with cementitious material of any desired color in order to obtain ornamental effects. The grooves may be run in various directions and may be grouped according to specific design in order to enhance the ornamental appearance of the wall structure. On the other hand the grooves facing the interior of the building may be shaped in the form of keyways, forming keys which may be utilized as anchoring elements for the attachment of the structural unit to metallic reenforcing members or to a plastic mass such as concrete or plaster.

My invention furthermore contemplates a structural plate formed of a plastic material subject to cold flow having a plane surface which may be attached by nailing to a supporting foundation surface and which may be provided with its reenforcing elements formed of hard cementitious material upon another surface of the member or interiorly thereof between opposed surfaces of the member and extending through the interior of the plate.

It is a further object of the invention to provide a structural assembly embodying a plurality of juxtaposed plates formed of plastic material fitted with cooperating keyways at the adjoining surfaces which are adapted to receive a hard cementitious filling serving to reenforce the assembly as well as to maintain the component parts thereof in alignment.

It is a further object of the invention to provide a wall construction embodying a pair of structural slabs in accordance with the present invention which are reenforced as described above and which, in addition, are retained in place and reenforced by a rigid mass of cementitious material interlocked with the structural slabs and reenforcing them. As an additional refinement to this construction, metallic bridging plate members may be used to span the keys on the opposing faces of the spaced structural slabs, and the spaces between these bridging plates and the slabs may be filled with the cementitious material.

Other objects and purposes will appear from a more detailed description of the invention following hereinafter taken in conjunction with the accompanying drawing wherein:

Figure 1 is a transverse sectional view of a wall construction embodying my present invention,

Figure 1*a* is a perspective view of one of the slabs shown in Figure 1,

Figure 1*b* is a perspective view of a modified form of slab from that shown in Figure 1,

Figure 2 is an enlarged view of the bridging plate assembly extending between the spaced structural plates shown in Figure 1,

Figure 3 is a perspective view of the bridging plate prior to its application in the wall construction,

Figure 4 is a longitudinal sectional view of two superposed structural plates having formed therebetween a keyway adapted to receive an aligning member, and

Figure 4*a* is a perspective view of the aligning member which may be preformed or which may

be formed after the placement of the structural plates.

In Figure 1 is shown a wall construction made up of slabs of plastic material A joined by a layer of hard cementitious material G between them. In this embodiment of the invention the slab on the right is exposed to the exterior and is provided with horizontally extending grooves O filled with a cementitious material or mixture O' as shown in Figure 1*a*. Keys D are formed on both faces of the slab on the left and on the left face of the slab on the right giving rise to keyways which serve as repositories for reenforcing channels of cementitious material for their respective slabs. The keys D may be anchored in place solely by the body of hardened cementitious material, or supplemental fastening means may be provided by bridging plates B extending between the oppositely disposed keys and which may be further tied in by means of bolts I provided with heads E on one end and nuts J on the other. The keys D on the left side of the left slab may be anchored in place by being imbedded in a mass of concrete or plaster. The bridging plates B are tied in place and are useful in holding the wall slabs in position while the filling medium is poured between the slabs. The filling may be either aerated concrete or may be a regular cement mixture, cement gravel or any other type of plastic insulating compound which can be poured into the space between the two wall members for holding them together.

Grooves K may be provided in the end walls of the slabs and may be filled with a mixture of Portland cement and asbestos fiber which serves as a strengthening means as well as a sealing means between the strips. When dry this cementitious material prevents distortion and buckling of the wall by holding the juxtaposed strips in alignment. A preformed filling such as shown at L' in Figure 4*a* may be used for the same purpose.

Figure 1*a* is a perspective view of the slab on the right side of Figure 1. As stated above, the reenforcing ribs O' may assume any coloring or design to enhance the ornamental appearance of the external surface of the wall. These reenforcing ribs are preferably disposed in a direction transverse to the direction of the principal stresses to which the wall member is subjected.

In Figure 1*b*, is shown a modified construction of a slab having keys D spaced by keyways C which serve as channels for receiving a reenforcing medium and which in addition may exercise an anchoring function. The opposite surface of the slab is formed as a plane F for attachment to a plane surface such as a wall board by nailing, or to the studding of a building construction, or to any other unit which requires a plane facing material.

In Figure 2 is shown an enlarged view of the mode of bridging two spaced slabs A by means of the metallic bridging members B which are tied together and reenforced by means of bolt I having a head E and held together on the opposite end by a nut J.

Figure 3 shows these members B with their uniting elements in perspective view.

In Figure 4 is shown two superposed slab sections in which the grooves K register to form a space L filled with a cementitious material serving to reinforce the wall structure and to maintain the superposed members in alignment. As stated above, this space L may be filled with a preformed rod L' serving the same purpose, as shown in Figure 4*a*.

In the construction of a wall in accordance with the present invention it may be necessary to block the ends of the slabs in order to confine the filling material until it has hardened. Where corners are formed, special corner pieces may be employed or the strips may be so interlocked at the corner as to form a prepared joint. Likewise in preparing the foundation for this structure it may be advantageous to place anchors in the foundation which will extend between the strips and aid in holding them in permanently anchored position.

While I have described my invention as embodied in concrete form as operating in a specific manner for purposes of illustration, it should be understood that I do not limit my invention thereto, since various modifications will suggest themselves to those skilled in the art without departing from the spirit of my invention, the scope of which is set forth in the annexed claims.

What I claim is:

1. A structural member formed of a plastic material subject to cold flow having a plurality of keys in the opposite faces thereof filled with a cementitious substance harder than said plastic material operating to prevent distortion of said member.

2. A structural plate member formed of a plastic material subject to cold flow and distortion having a plurality of grooves formed in the opposite faces thereof filled with a mixture of a cementitious substance and a fibrous substance, said mixture being harder than said plastic material and in its hardened state serving as a reenforcement for said plate member for preventing the distortion thereof.

3. A structural plate member formed of a plastic material subject to cold flow and distortion, a plurality of grooves in the opposite faces of said plate member extending in a direction transverse to that of the distorting stress imposed upon said plate member, and a filling of hardened cementitious material in said grooves for reenforcing said plate member against distortion.

4. A structural slab formed of a plastic material subject to cold flow having grooves formed upon one surface thereof filled with a hard cementitious material functioning simultaneously as a reinforcement for said slab and as an ornamentation for said surface and having keys formed upon the opposite surface of said slab adapted to be filled with cementitious material and serving as a reenforcement of said slab and as an anchoring means for said slab to a base structure.

5. A composite wall structure formed of two spaced structural slabs of a plastic material subject to cold flow and distortion, each of said slabs having locking keys formed on the surfaces of said slabs facing each other, and a mass of cementitious material which in its hardened state is harder than said plastic material interposed between said slabs and interlocking said keys to form a reenforcement for the individual slabs and the complete wall to prevent the distortion thereof.

6. A composite wall structure formed of two spaced structural slabs of a plastic material subject to cold flow and distortion, each of said slabs having locking keys formed on the surfaces of said slabs facing each other, a mass of cementitious material which in its hardened state is

harder than said plastic material interposed between said slabs and interlocking said keys to form a reenforcement for the individual slabs and the complete wall to prevent the distortion thereof, a plurality of grooves in the external face of one of said slabs extending in a direction transverse to that of the stresses acting upon said wall structure, and a filling of hardened cementitious material in said grooves for additionally reinforcing said wall structure.

7. A composite wall structure formed of two spaced structural slabs of a plastic material subject to cold flow and distortion, each of said slabs having locking keys formed on the surfaces of said slabs facing each other, a mass of cementitious material which in its hardened state is harder than said plastic material interposed between said slabs and interlocking said keys to form a reenforcement for the individual slabs and the complete wall to prevent the distortion thereof, a plurality of grooves in the external face of one of said slabs extending in a direction transverse to that of the stresses acting upon said wall structure, a filling of hardened cementitious material in said grooves for additionally reenforcing said wall structure, and a plurality of keys formed in the external surface of the other one of said slabs for attaining an interlocking engagement therebetween and the plastic mass of a foundation structure.

8. In a composite wall structure formed of a plurality of superposed pairs of spaced structural slabs of plastic material subject to cold flow and distortion, each of said slabs having locking keys formed on the surfaces of said slabs facing each other, a mass of cementitious material interposed between said slabs and interlocking said keys to form a reenforcement for the individual slabs and the complete wall to prevent the distortion thereof, and cooperating grooves in the end walls of at least one set of the superposed and juxtaposed slabs filled with a hardened cementitious substance for maintaining the superposed sections in alignment and for preventing the buckling of the wall structure.

9. A composite wall structure formed of two spaced structural slabs of plastic material subject to cold flow and distortion, each of said slabs having locking keys formed on the surfaces of said slabs facing each other, pairs of metallic bridging plates extending between the keys on said slabs, and a filling of hardened cementitious material which in its hardened state is harder than said plastic material interposed between said slabs and said plates adapted to reenforce the individual slabs and the composite wall against lateral distortion.

10. A composite wall structure formed of two spaced structural slabs of plastic material subject to cold flow and distortion, each of said slabs having locking keys formed on the surfaces of said slabs facing each other, pairs of metallic bridging plates extending between the keys on said slabs, locking bolts for maintaining said bridging plates in position and in interlocking engagement with the keys, grooves formed upon the external face of at least one of said slabs, and a filling of hardened cementitious material which in its hardened state is harder than said plastic material in said grooves for reenforcing said wall structure adapted to reenforce the individual slabs and the composite wall against lateral distortion.

11. A composite wall structure formed of two spaced structural slabs of plastic material subject to cold flow and distortion, each of said slabs having locking keys formed on the surfaces of said slabs facing each other, pairs of metallic bridging plates extending between the keys on said slabs, locking bolts for maintaining said bridging plates in position and in interlocking engagement with the keys, and a filling of hardened cementitious material interposed between said slabs and said bridging plates adapted to reenforce the individual slabs and the composite wall against lateral distortion.

12. A substantially vertically disposed structural wall member formed of a plastic material subject to cold flow having a plurality of grooves in an external surface thereof filled with a cementitious substance harder than said plastic material for preventing lateral distortion of the wall member.

13. A substantially vertically disposed structural wall member formed of a plastic material subject to cold flow having a plurality of substantially horizontally disposed grooves in the opposite external surfaces thereof filled with a cementitious substance harder than said plastic material for preserving the integrity of the wall and for preventing lateral distortion thereof.

ALBERT C. FISCHER.