Aug. 6, 1946. A. B. CULLEN 2,405,116

BUILDING CONSTRUCTION

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Fig. 1.

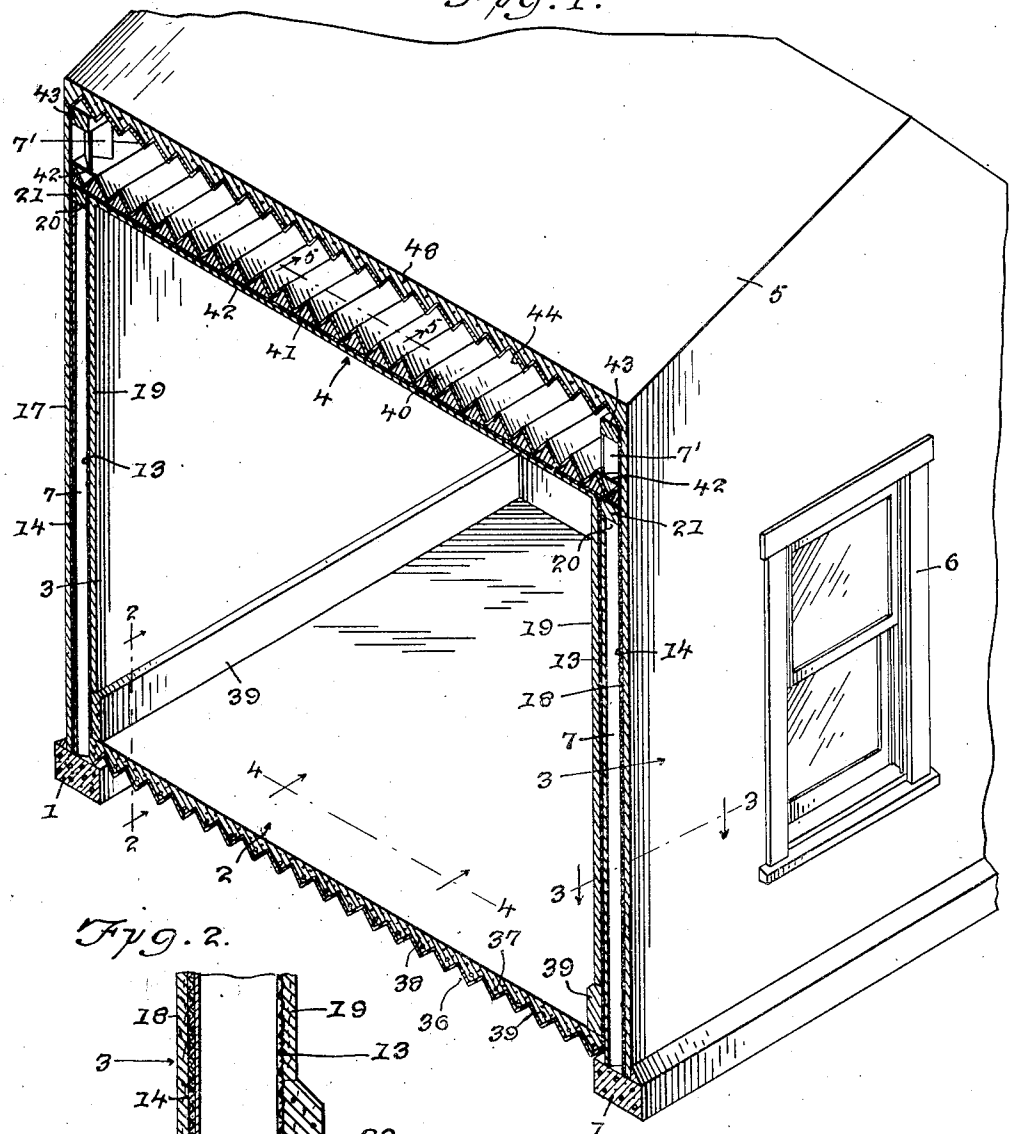
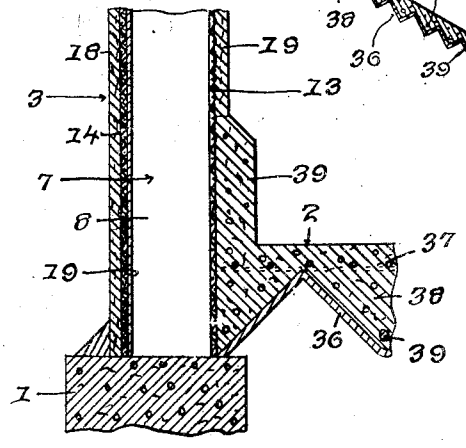


Fig. 2.



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BUILDING CONSTRUCTION

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Fig. 3.

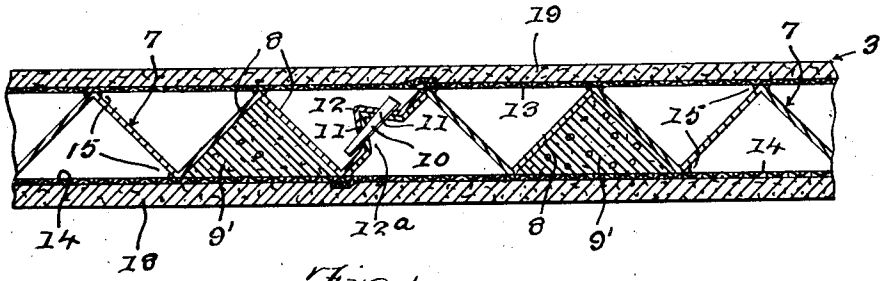


Fig. 4.

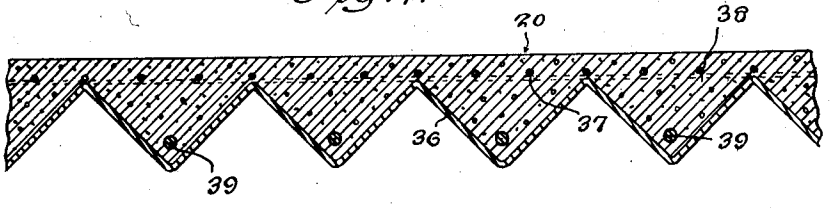


Fig. 5.

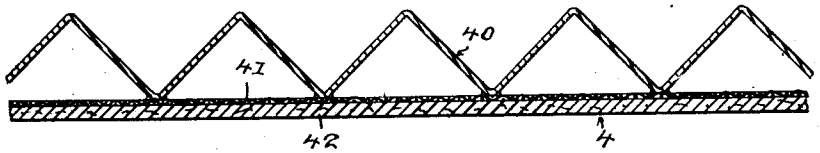


Fig. 6.

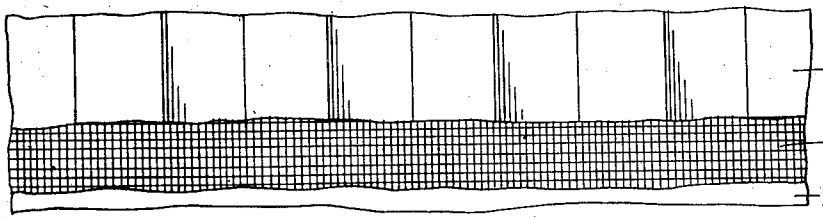
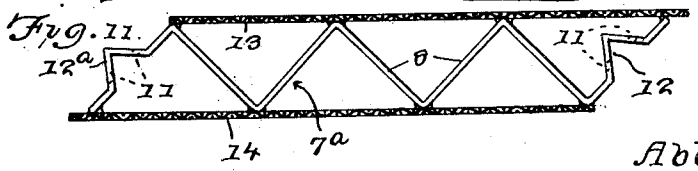


Fig. 11.



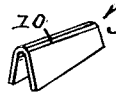


Fig. 12.

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BUILDING CONSTRUCTION

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Fig. 7.

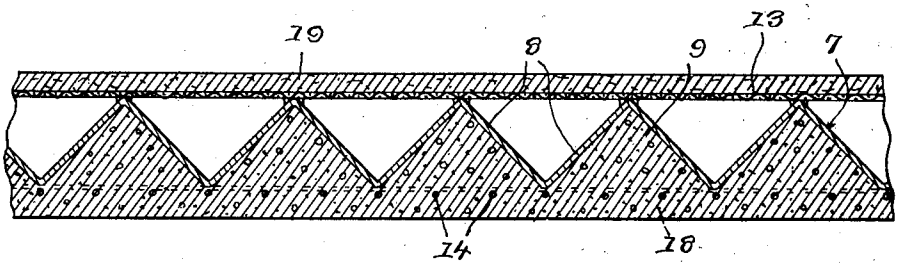


Fig. 8.

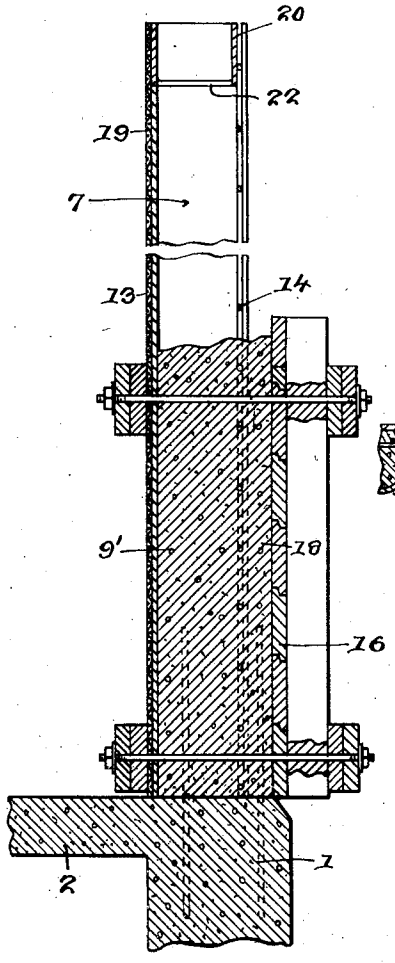
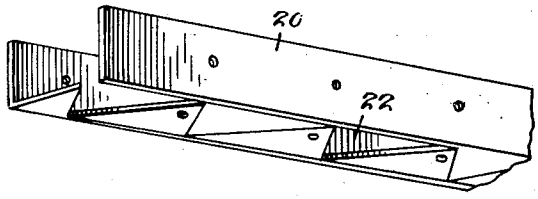


Fig. 9.



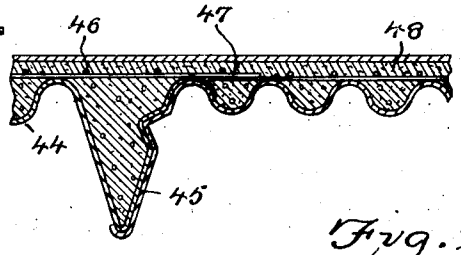


Fig. 10.

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UNITED STATES PATENT OFFICE

2,405,116

BUILDING CONSTRUCTION

Abbie B. Cullen, Oxford, Miss.

Application March 9, 1944, Serial No. 525,702

3 Claims. (Cl. 72—1)

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This invention relates to building construction and it is one object of the invention to provide a building of such construction that it may be very easily erected and when completed will be fireproof, vermin-proof, storm-proof, damp-proof, and rot-proof.

Another object of the invention is to provide a building wherein the walls, floor, ceiling and roof are of such formation that the finished building will be very strong and not liable to be distorted and wherein the walls and ceilings will not be liable to crack.

Another object of the invention is to provide an improved building construction wherein the walls and other portions of the building are formed of sheet metal and reinforced concrete, the sheet metal being crimped to strengthen the same and also hold the concrete against cracking movements.

Another object of the invention is to provide a building of such construction that it may be quickly erected at small cost since a minimum amount of skilled labor is necessary and the sheet metal may be precut and delivered at the building site ready to be erected.

Another object of the invention is to provide a building construction wherein sheet metal sections are disposed in side-by-side relation to each other and their adjoining side edge portions securely held together by pins or by welding and thus prevent the strips from having movement relative to each other.

The invention is illustrated in the accompanying drawings wherein:

Figure 1 is a perspective view of a building of the improved construction, a portion of the building being in vertical section.

Figure 2 is a fragmentary sectional view taken through the floor and the lower portion of a wall along line 2—2 of Figure 1.

Figure 3 is a sectional view upon an enlarged scale taken horizontally through the front wall of the building along line 3—3 of Figure 1.

Figure 4 is a sectional view taken through the floor along line 4—4 of Figure 1.

Figure 5 is a sectional view through the ceiling taken along line 5—5 of Figure 1.

Figure 6 is a fragmentary view of a wall with portions broken away.

Figure 7 is a sectional view similar to Figure 3 and showing a modified wall construction.

Figure 8 is a sectional view taken vertically through a wall and illustrating the manner in which a wall is erected.

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Figure 9 is a perspective view of a portion of a top filler for a wall.

Figure 10 is a sectional view of a modified form of roof.

Figure 11 is a view in edge elevation of one of the wall frame units, and

Figure 12 is a perspective view of one of the pins keys by which the units are connected in assembled relation.

The building shown in Figure 1 and constructed in accordance with this invention has a foundation 1, a floor 2, walls 3, a ceiling 4 and a roof 5. The interior of the building may be a single room, as shown, or it may be divided by partitions to form a number of rooms, it being also understood that the walls will be provided with suitably located doors and windows, one window being shown and indicated by numeral 6.

In the embodiment of the invention shown in Figures 2 and 3, the walls each comprise a frame 7, a coating 17 of concrete on the outer side of the frame, and a coating 19 of plastic on the inner side of the frame. The frame 7 is made up of prefabricated units 7^a which may be of any desired length, thickness and breadth and each of which comprises a corrugated metal sheet 8 and sheets 13 and 14 of wire netting. In each unit, the corrugated sheet 8 is located between the sheets of wire netting 13 and 14, and the latter are secured to the former by welding or in any other suitable manner. The frame units 7^a are provided at certain edges with V-shaped grooves 12 and at the other edges with correspondingly shaped ribs 12^a. The wire netting 13 extending beyond those edges of the units provided with the grooves 12 and the wire netting 14 extending beyond those edges equipped with the ribs 12^a. In the frame structure, the ribs 12^a fit in the grooves 12, and the extended ends of the netting of one overlaps the netting of the adjacent units, as shown in Figure 3. The units are secured in assembled relation by pins 10, as shown in Figure 3, the construction of the pins being shown in Figure 17.

Referring to Figure 8 it will be seen that during erection of the wall a mould 16 of a transferable or temporary construction is erected or set in place and may be so spaced from the outer face of the frame 7 so that a concrete facing 17 will be provided for the wall, as shown in Figure 7. Instead of forming the wall with a concrete facing 17 the concrete may merely fill the channels of the frame and a stucco finish 18 applied to the outer mesh 14. By only filling certain of the channels with concrete the wall will be formed

with supporting columns 9', as shown in Figure 3, instead of forming a solid concrete wall as shown in Figure 7. The outer mesh 14 is coarse mesh of the type used when applying a concrete finish or stucco and the inner mesh in finer or may be metal lathing of the type used for holding plaster 19 in place against a wall. After the wall has been built to the desired height a top filler 20 formed as a channeled structure or trough is set in place and filled with concrete 21, and referring to Figure 9 it will be seen that the bottom of the top filler is scored so that portions may be knocked out and form a suitable number of openings 22 so that concrete in the top filler may merge with the concrete 9 of the wall or with upper ends of the concrete columns 9'.

The floor 2 consists of a sheet metal base 36 formed from sheets of strong metal which are crimped to form corrugations and are welded or otherwise secured to each other. Marginal portions of the base rest upon inner side portions of the foundation 1 and upon upper edges of the corrugations is disposed wire fabric 37 of the type used for reinforcing concrete. The wire fabric is welded to corrugations of the base sheet and when concrete 38 is poured upon the base to form the concrete floor, the concrete fills the channels defined by the corrugations and forms a very strong structure. Reinforcing rods 39 which extend longitudinally in the channels assist in reinforcing the concrete. Along walls of the building the concrete is extended upwardly to form a baseboard 39 which may be of any height desired. The floor may be laid either before or after the walls are erected and if the floor is laid first the baseboard will be formed after the wall reaches a sufficient height for the mould to be shifted upwardly out of the way.

After the walls have been erected to the height of a room the ceiling 4 is formed. This ceiling has a frame 40 which is formed from corrugated sheet metal and of such dimensions that its marginal portions rest upon the walls in overlying relation to the top fillers 20. Wire mesh 41 is welded to the corrugated sheet metal and covered with plaster 42 which merges into the plaster 19 of the walls. Referring to Figure 1 it will be seen that over the top fillers of the front and rear walls the sheet metal frame 40 of the ceiling is bent forming inwardly extending flat portions 42 upon which rest frames 7' which are formed of corrugated sheet metal and constitute continuations of the frame 7. Concrete beams 43 rest upon upper ends of the frames 7' and constitute supports for marginal portions of the roof.

The roof also has a frame 44 formed from lengths of corrugated sheet metal which may have the corrugations V-shaped in cross section, as shown in Figure 1, or U-shaped as shown in Figure 10. Referring to Figure 10 it will be seen that portions of the sheet metal strips forming frame 44 may be extended downwardly to a greater extent than the corrugations and interlocked with each other to form sheathings for rafters 45 which will be spaced from each other a predetermined distance. Lengths of wire mesh 46 are welded to tops of the corrugations of the frame 44 and referring to Figure 10 it will be seen that the strips or sheets of mesh have portions overlapped as shown at 47. After the frame 44 has been set in place concrete 48 is poured to a depth sufficient to fill the frame and cover the mesh and the upper surface of the concrete troweled to form a smooth upper or outer surface for the roof.

It will thus be seen that the building when erected has a wall, a floor, a ceiling and a roof, all being formed of corrugated metal frames and poured concrete reinforced and held in place by coarse mesh or fine mesh. It will be obvious that in case the building is to have an upper room or rooms a combined floor and ceiling will be provided between the upper and lower rooms and the upper room having a ceiling of the construction shown in Figures 1 and 5.

The wall frame is made up of prefabricated units and the units are secured together in the manner shown in Figure 3. The sheet metal base and the ceiling frame are also made up of prefabricated units. These units may be secured together in the manner shown in Figure 3 or in any other suitable manner.

Having thus described the invention, what is claimed is:

1. In a building, a foundation, walls rising from the foundation and each having a frame of vertically corrugated sheet metal, metal mesh secured against corrugations of the frame at inner and outer sides thereof, concrete covering the outer mesh and filling certain outer channels formed by the corrugations to form vertical concrete columns and a concrete outer facing for the wall, top fillers for the walls of trough shape and having their bottoms formed with openings, and concrete filling the trough-shaped top fillers and merging with the concrete of the walls through the openings, and plaster applied to the inner mesh.

2. In a building, a foundation, walls rising from the foundation and each having a frame of vertically corrugated sheet metal, metal mesh secured against corrugations of the frame at inner and outer sides thereof, concrete filling outer channels defined by the corrugations and covering the outer mesh, trough-shaped top fillers for the walls resting upon the frames and having openings in their bottoms, concrete in the top fillers merging with the concrete in the channels through the openings in the top fillers, plaster applied to the inner mesh, a ceiling having a frame of corrugated sheet metal, metal mesh disposed under the frame of the ceiling and secured against corrugations thereof, the frame and the mesh of the ceiling having marginal portions resting upon the top fillers of the side walls, and plaster for the ceiling applied to the mesh thereof.

3. In a building, a foundation, walls rising from the foundation and each having a frame of vertically corrugated sheet metal, metal mesh secured against corrugations of the frame at inner and outer sides thereof, concrete filling outer channels defined by the corrugations and covering the outer mesh, trough-shaped top fillers for the walls resting upon the frames and having openings in their bottoms, concrete in the top fillers merging with the concrete in the channels through the openings in the top fillers, plaster applied to the inner mesh, a ceiling having marginal portions supported upon the top fillers and having a frame of corrugated concrete and metal mesh covered with plaster, corrugated framing for the walls resting upon marginal portions of the frame for the ceiling, beams resting upon the last mentioned framing, and a roof having a frame of corrugated sheet metal resting upon said beams, and concrete covering the frame of the roof and merging with the outer concrete facing of the walls.

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