Sept. 22, 1942. B. E. BALDUF 2,296,416

BUILDING CONSTRUCTION

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Fig.2

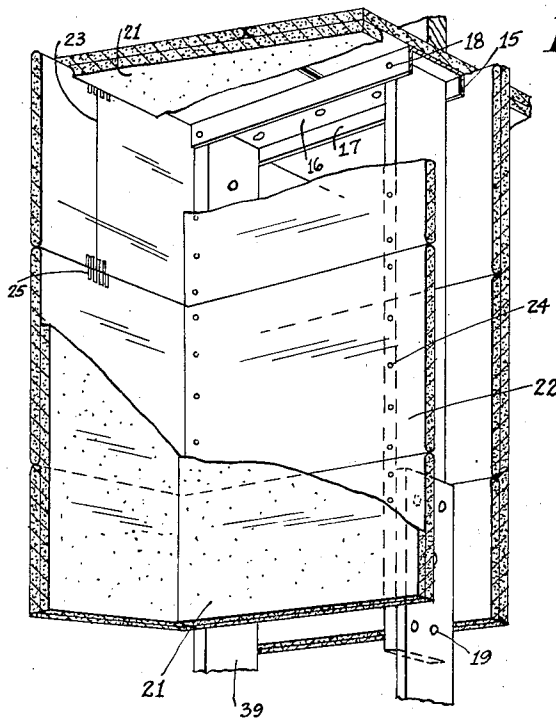


Fig.1

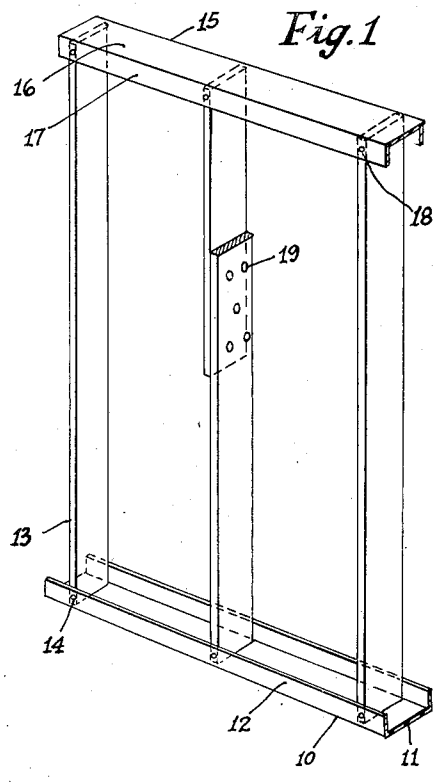
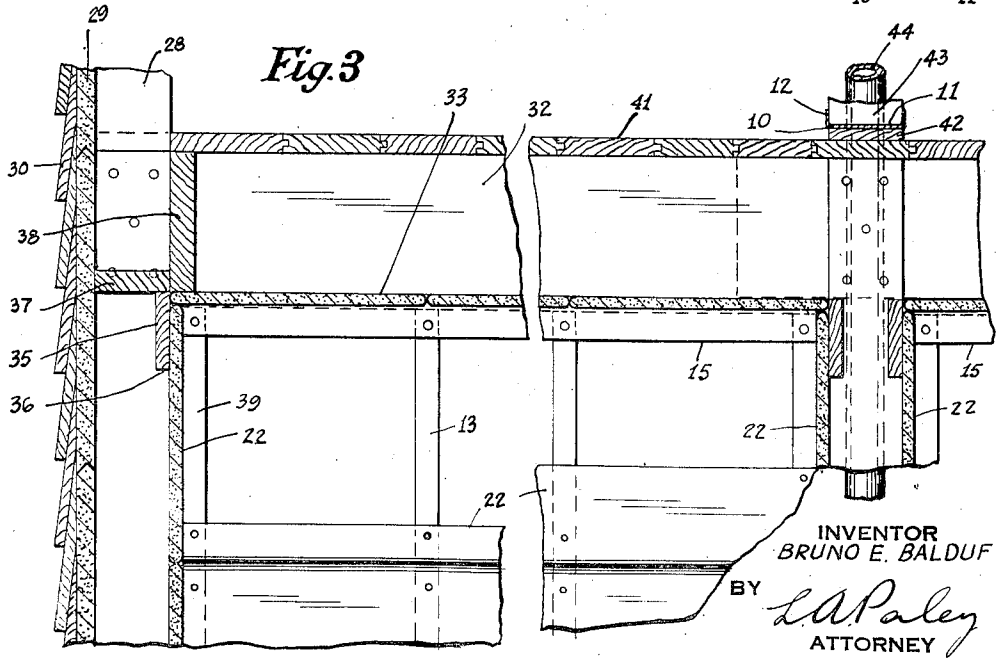


Fig.3



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Fig. 4

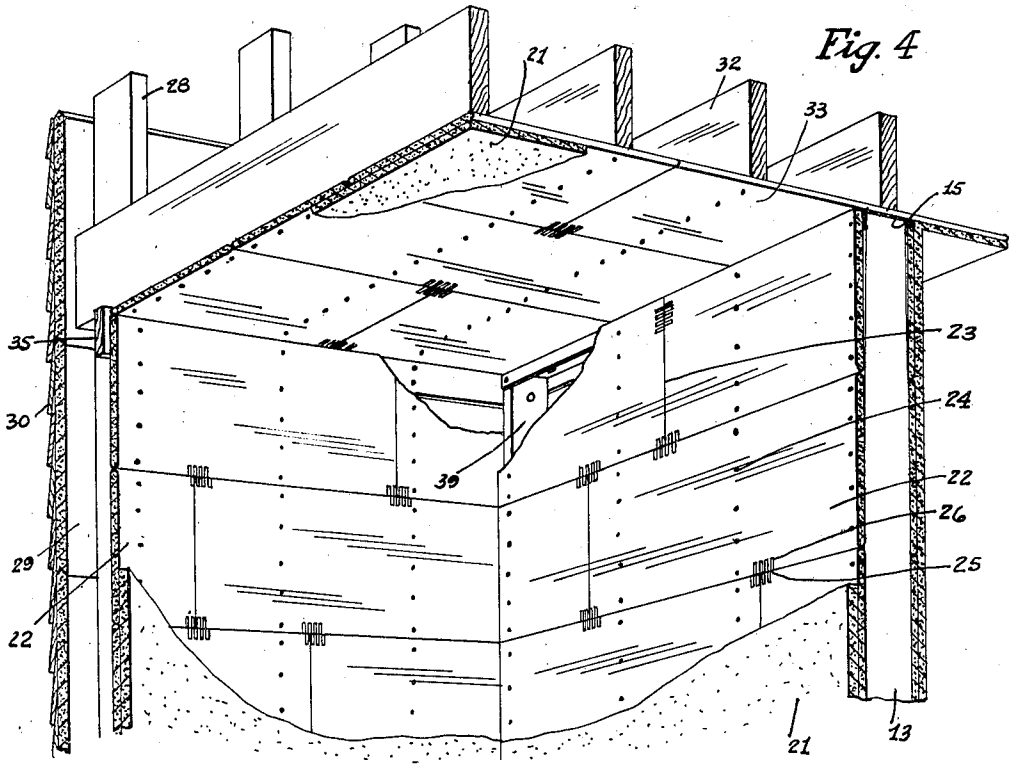


Fig. 5

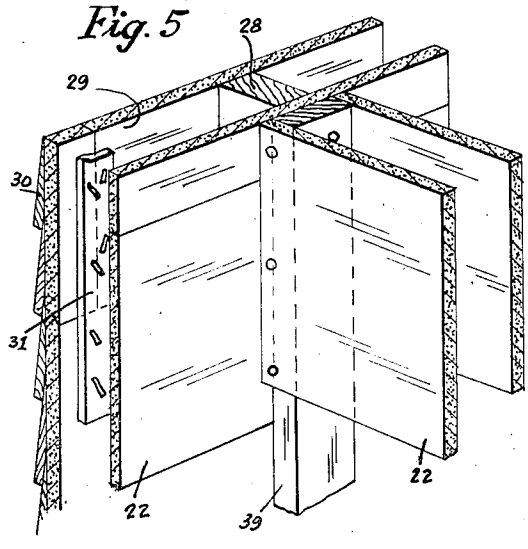
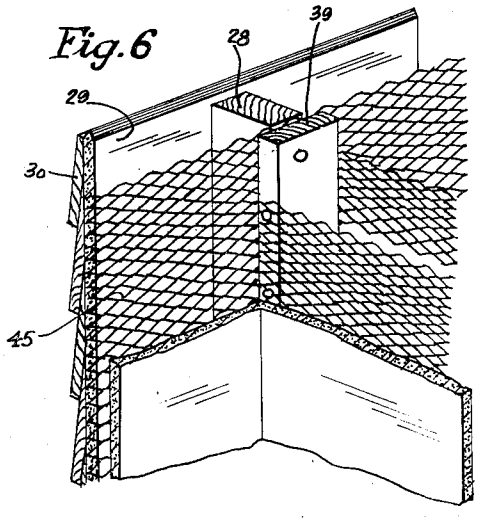


Fig. 6



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UNITED STATES PATENT OFFICE

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BUILDING CONSTRUCTION

Bruno E. Balduf, Chicago, Ill., assignor to United States Gypsum Company, Chicago, Ill., a corporation of Illinois

Application January 5, 1940, Serial No. 312,495

3 Claims. (Cl. 20—4)

This invention relates to building constructions, and has reference more particularly to framing for buildings which is composed partly of wood and partly of metal.

In the construction of wood frame buildings, it is customary to use spaced 2 x 4's for the wall frames, these 2 x 4's being supported at top and bottom by plates and sills respectively, also composed of 2 x 4's. Building composition boards of gypsum or fiber base are then nailed to the studs, and a finishing layer of plaster is then applied to the boards. As time passes, the wood studs twist and warp due to changing humidity conditions, and as they are transversely very strong, the building boards are distorted and the plaster cracks adjacent the abutting edges of the boards. Furthermore, the plates and sills burn rapidly in case of a fire and do not act as a fire stop but permit the flames to travel up the hollow walls from story to story of the building. Due to the thickness of the studs, it is common to have the ends of the boards abut at the studs, each board being secured thereto by nails. The boards must be the exact length to fit the studs resulting in considerable cutting and waste of boards.

An object of the invention, therefore, is to provide a frame for buildings comprising weaker wooden studs of less thickness than those commonly used so that the plaster is not cracked due to warping and twisting of the relatively weak studs.

Another object of the invention is to employ channel-shaped metal plates and sills for these weaker studs which will act as a fire stop in case of fire.

A further object of the invention is to produce a building construction of relatively thin studs with the abutting ends of boards positioned between the studs, thus producing little cutting and waste of boards; also to improve building constructions in other respects hereinafter specified and claimed.

Reference is to be had to the accompanying drawings forming a part of this specification, in which

Fig. 1 is a perspective view of the improved wall or partition frame for the building construction,

Fig. 2 is a sectional perspective view of the partitions,

Fig. 3 is a sectional elevation through a building showing the manner of framing,

Fig. 4 is a perspective sectional elevation of a room showing the manner of attachment of plaster boards,

Fig. 5 is a sectional perspective elevation of a corner of a room showing modified structural features, and

Fig. 6 is a sectional perspective elevation of a modified form of construction using metal lath as a plaster base.

Referring to the drawings by numerals, bottom metallic channels 10 are secured to the floor by nailing through channel webs 11, or by other suitable means. Upstanding legs 12 on the channels 10 receive the lower ends of studs 13 therebetween. Nails 14 are driven through the thin metal flanges 12 into the studs 13 to hold said studs in position. A similar upper channel 15 is provided with a web 16 which is nailed to the ceiling. Downstanding legs 17 on the channel 15 receive the upper ends of studs 13 and nails 18 are driven through the flanges 17 into said studs 13 to maintain said studs in spaced, parallel relation. For non-load bearing partitions, I prefer to use 1'' x 4'' wooden studs instead of the 2'' x 4'' wooden studs commonly used, as they do not have sufficient lateral strength to distort and crack the finishing coat of plaster when the studs twist and warp under the action of changing conditions of temperature and humidity. The 1'' x 4'' studs are also less expensive than the 2'' x 4'' studs. Furthermore short lengths of the 1'' x 4'' studs may be readily lapped and joined together by nails 19 so that loss due to scrap lumber is practically eliminated.

In order to provide a base for a finishing coat of plaster 21, I provide plaster boards 22 which are preferably composed of a gypsum core with paper cover sheets, but said boards may be composed of other materials such as vegetable fiber, etc. Due to the thinness of the studs 13, it is impossible to have the ends of adjoining boards 22 abut over the stud as there is insufficient wood in the stud for nailing purposes. I therefore cause end board joints 23 to come at a point between the studs so that the boards are secured to the studs by a single row of nails 24. The abutting ends of the boards 22 are secured together by clips 25 which have opposed struck-out fingers 26 forming opposed channels for the reception of the board edges. The board ends are thus held securely in the plane of the wall to receive the coating of plaster 21. In view of the fact that the thin studs 13 have insufficient lateral strength to distort the boards 22 as said studs warp and twist due to changing temperature and humidity conditions, the plaster coat-

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ing 21 exhibits a marked resistance to cracking over long periods of service. The lateral weakness of the studs 13 also permit a slight flexibility or vibration of a partition under the impact of sound waves, thus offering marked resistance to the passage of sound through the improved partition.

The outer load bearing walls of the building (Fig. 5) are preferably composed of 2'' x 4'' studs 28 to the outside of which are nailed tongue and groove gypsum sheathing boards 29 covered by wood siding 30 or other suitable weather resistant facing. Strips of wood 31 are nailed to the inside face of the sheathing over the abutting ends of boards 29 so as to keep out wind, and to maintain said board ends in the plane of the wall. Horizontal joists 32 are nailed to the studs 28 and plaster boards or wallboards 33 are nailed to the bottom of the joists 32 to receive the coating of plaster 21 or a decorative finish of paint or wall paper as desired. The vertical walls may also be lined with wallboards 34 which are finished with paint or wall paper. I prefer to attach the boards 33 to the joists 32 before installing the dividing partitions supported by the thin studs 13. The webs 16 of upper channels 15 are thus nailed directly to the bottom face of ceiling boards 33. This manner of erecting dividing partitions last offers some saving in labor and cost of erection of a building. The ends of the joists 32 are supported on a strip of wood 35 known as a "ribbon," said strip being received in notches 36 formed in the studs 28. Fire stop 37 is secured adjacent the top of ribbon 36 and fire stop 38 adjacent the end of joists 32. Angle clips attach together the adjoining edges of boards 22 and 33 at the corner of the ceiling. The edges of the partition boards 22 are nailed to a stud 39 which in turn is nailed flatwise against the boards 22 of the outer wall to one of the studs 28. A floor 41 is supported on top of the joists 32. For a partition, a strip of wood 42 is secured to the top of the rough floor 41 and a channel runner 10 is secured to the top of a spacer strip 42 to receive studs 43. The strip 42 is the thickness of the finish floor so that all studs in a building are the same length. If the channel runner 10 is placed on top of the finished floor, the strips 42 are omitted. Pipes or conduits 44 may be passed upwardly through the partitions and floor 41 as desired. Metal lath 45 may be substituted for the boards 22 and 33 as a plaster base if desired. It should be understood that 2'' x 4'' studs may be used instead of 1'' x 4'' studs if desired where cracking of the plaster is not definitely to be avoided.

I would state in conclusion that while the illustrated examples constitute practical embodiments of my invention, I do not wish to limit myself precisely to these details, since manifestly the same may be considerably varied without departing from the spirit of the invention as defined in the appended claims.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. In a partition structure, opposed floor and ceiling metallic channels having outstanding flanges, flexible wooden studs in spaced parallel relation engaged at top and bottom between said channels, nails passing through said flanges into said studs, and facing means attached to said studs, said wooden studs being sufficiently flexible to prevent material distortion of said facing means by the normal warping tendency of said studs.

2. In a plastered wall construction characterized by freedom from plaster cracks, opposed floor and ceiling metallic channels having outstanding flanges, thin wooden studs secured at top and bottom between said flanges, plaster supporting sheets secured to said studs with their end joints therebetween, and clips securing said end joints together, a coating of plaster on said sheets, said studs being sufficiently thin and flexible to prevent cracking of said plaster by the normal warping tendency of said studs.

3. In a non-load-bearing partition structure the combination with ceiling and floor metal channel runners and thin flexible wood studs having their ends seated in said runners and secured to the flanges thereof, of wallboards nailed to said studs with their ends abutting between said studs, clips securing the edges of said wallboard together between said studs, and a plaster coating on said wallboards, said studs being sufficiently thin and flexible so that their torsional warping strength in response to temperature and humidity variations is insufficient to materially distort the wall covering.

BRUNO E. BALDUF.