

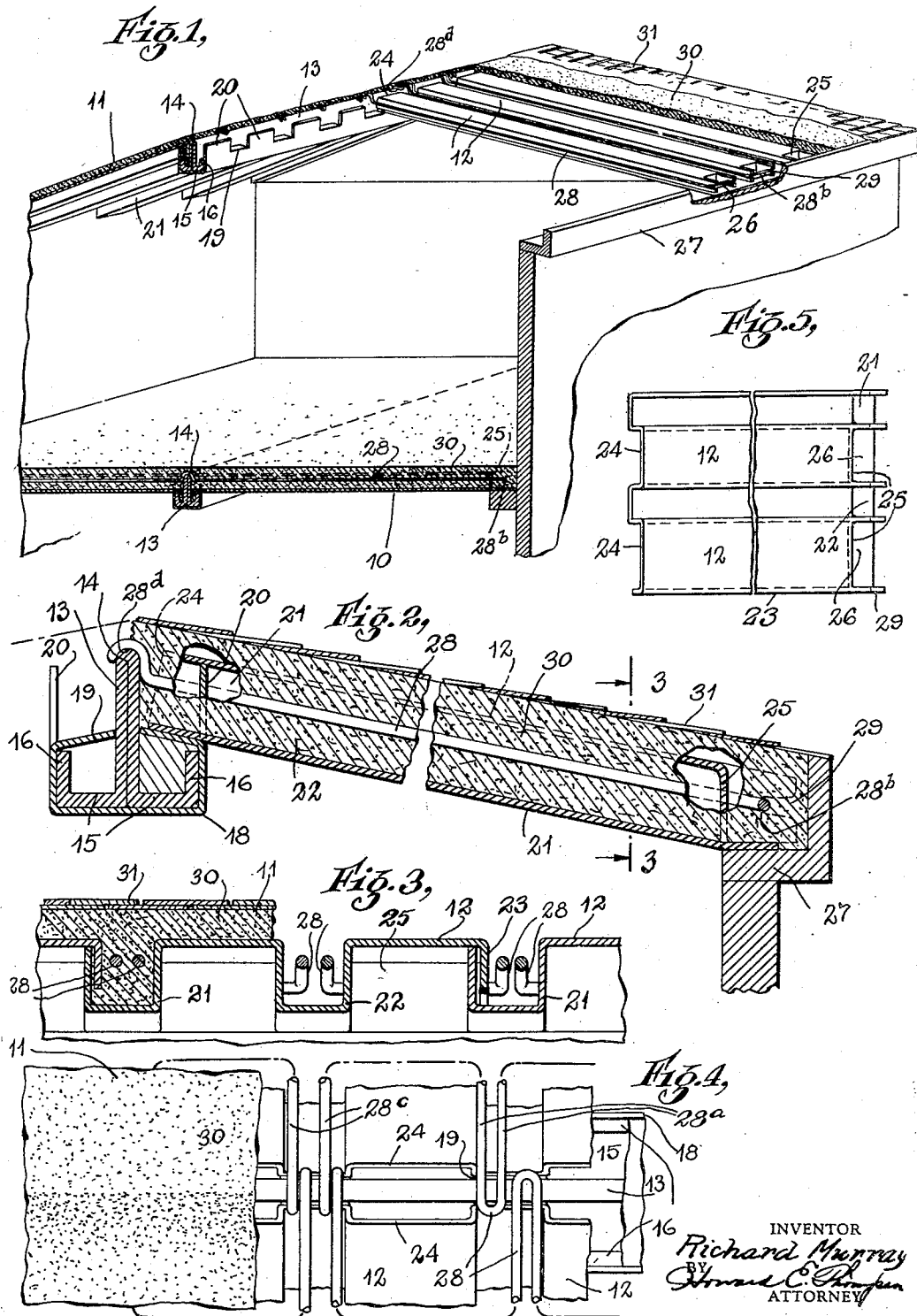
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CEILING, FLOOR, AND ROOF CONSTRUCTION

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UNITED STATES PATENT OFFICE

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CEILING, FLOOR, AND ROOF CONSTRUCTION

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This invention relates to the construction of the ceilings, floors and roofs of buildings; and the object of the invention is to provide a construction of this class consisting of a plurality of sheet metal sections adapted to extend from wall to wall or from a beam arranged centrally of a room to opposite walls thereof, the side edges of said sections interlocking, and said sections forming the surface of the ceiling and being preferably ribbed to form a beamed ceiling effect; a further object being to provide reinforcing members employed in conjunction with said sections to reinforce the body of concrete arranged within and above the same, said body of concrete forming the floor surface or the support for the roof structure of a building or the tiles or other facings employed in conjunction therewith; a further object being to provide a central beam in connection with which said sections and reinforcing members operate, said central beam being fashioned to receive said sections and reinforcing members as well as the body of concrete employed; and with these and other objects in view, the invention consists in a structure of the class and for the purpose specified which is simple in construction, efficient in use, and which is constructed as hereinafter described and claimed.

The invention is fully disclosed in the following specification, of which the accompanying drawings form a part, in which the separate parts of my improvement are designated by suitable reference characters in each of the views, and in which:—

Fig. 1 is a perspective view showing part of the upper floor and roof structure of a building and illustrating the manner of constructing said floor and roof.

Fig. 2 is an enlarged and broken section of a part of the structure shown in Fig. 1.

Fig. 3 is a partial section on the line 3—3 of Fig. 2.

Fig. 4 is a plan view of a part of the structure shown in Fig. 1 on an enlarged scale; and,

Fig. 5 is a plan view of one of a number of sections which I employ with part of the construction broken away.

For the purpose of illustrating one method of carrying my invention into effect, I have shown at 10 in Fig. 1 of the drawings, the upper floor of a building which also forms the ceiling for the floor below. At 11 I have shown a roof structure which may also constitute the ceiling of the upper floor. In practice, I employ a plurality of sheet metal sections 12 which may be of a length sufficient to extend from one wall to the opposite wall of a room or from one wall to a central beam 13 in the manner shown in the accompanying drawings.

The beam 13 is fashioned from a comparatively heavy gage of metal such as employed in the construction of steel beams or girders and consists of a vertical wall 14, oppositely extending lower walls 15 which terminate in upwardly extending flanges 16, note Fig. 2 of the drawings. Employed in conjunction with the beam 13 is a facing member 18 of comparatively thin metal which is arranged upon the lower face of the walls 15 and extends upwardly at the outer faces of the flanges 16 and above said flanges, the same being cut at intervals and fashioned to form inwardly directed tongues 19 between which are upwardly directed tongues 20. The tongues 19 rest upon the upper edges of the flanges 16 and serve to hold the facing 18 in position.

The sheet metal sections 12 are fashioned to provide at one end a longitudinal rib 21 which is U-shaped in cross sectional form, the channel of said rib being directed upwardly forming a beamed effect at the lower surface of said section, and a similar rib 22 is arranged substantially centrally of the section, whereas the other side of said section is provided with a downwardly turned flange 23 which is adapted to enter the channel of the rib 21 of an adjacent section 12 in the manner clearly seen in Fig. 3 of the drawings.

The ribs 21 and 22 at one end of the sections 12 are adapted to seat in the recesses formed by the inwardly and downwardly turned tongues 19 and to rest upon said tongues as clearly seen in Fig. 2 of the drawings. The top wall of the sections 12 adja-

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cent said end and between the ribs 21 and 22 and the rib 22 and flange 23 is cut out as seen at 24 to leave a space or opening between said ends of the sections and the vertical wall 14 of the beam 13 to permit the pouring of concrete downwardly into the channels of said beam inwardly of the flanges 16 as will be apparent.

The other or lower end of the sections 12, in the construction shown, is fashioned intermediate the side walls of the ribs 21, 22, and the flange 23, to form downwardly extending wall portions 25 and outwardly extending flanges 26 which rest upon the wall beams or other supports 27. The wall portions 25 serve to hold the concrete in proper position at said ends of the sections and also to finish the ceiling structure with the wall structure of the building, as will be apparent. The said lower end of the ribs 21 and 22 are bent slightly so as to seat properly upon the support 27.

In this connection, it will be understood that the upwardly directed tongues 20 extend into the recesses formed at the other end of the sections 12 between the top wall of said sections and the walls of the ribs 21 and 22 and take the place of the wall portions 25 as will be apparent.

It will be understood that the ribs 21 and 22 of the sections 12 when a complete floor and ceiling structure has been formed, form the facing of the ceiling and what may be termed a beamed effect in conjunction with the central beam when the same is employed. However, when this beam is not employed, both ends of the sections 12 will be formed similar to the end provided with the wall members 25 thereon.

Employed in conjunction with the sections 12 are reinforcing members 28 consisting of comparatively heavy rods folded centrally to form adjacent parallel rod members 28a adapted to be arranged in one of the channels formed by the ribs 21—22 and to extend longitudinally of said ribs from one end of the section to the other and are then bent laterally in opposite directions to form parts 28b adapted to be arranged adjacent the wall portions 25 and in notches 29 formed in the side walls of the ribs 21 and 22 at said end of said sections and then extend backwardly through the channels of the next adjacent ribs as seen at 28c note Fig. 4.

The ends 28c and the central portion formed by the parallel rods 28a are fashioned at their ends to form hook members 28d adapted to rest upon the upper edge of the vertical wall 14 of the beam 13, note Fig. 2 of the drawings and this serves to support said rods in proper position and also maintains the reinforcement in firm engagement with the supporting beam 13

which may constitute the ridge beam of a building.

The members 28 also serve to reinforce the body of concrete designated at 30 which is poured onto the coupled sections 12 and the beam 13 as well as upon the outer wall beams or supports 27 in forming the finish of the floor or roof structure, the concrete being poured to a level above the upper faces of the sections 12 and the beam 13 as will be apparent.

In forming a roof structure which is preferably inclined as diagrammatically illustrated, slates, tiles or the like 31 may be set into or partially imbedded in the concrete prior to the setting of the same, and in the operation of forming the roof structure, to provide a finish thereto other than the concrete finish if the same is desired.

When the concrete has been poured and the entire ceiling, floor or roof structure completed, it will be understood that this concrete is arranged within the ribs 21—22 and forms thereof concrete beams of which the sections 12 constitute merely a facing which may be painted or otherwise ornamented or decorated to give the desired ceiling effect, the distance between the ribs being governed solely and primarily by the desired effect to be produced, and this is also true of the particular cross sectional form or contour thereof. It will also be understood that the sections 12 may be arranged in any desired relation at opposite sides of the central beam 13 and any suitable arrangement of the reinforcing members 18 may be employed and in fact other reinforcement than that shown may be employed if desired.

In assembling the various sections and reinforcing members, it is preferred that the members 28 be coupled with each section prior to placing the same in position, or the outer ends of the sections may be raised after their assemblage in order to place the parts 28b in the recesses 29 as will be apparent. On the other hand, sufficient clearance may be allowed between the ends of said sections and the adjacent building wall or support to allow for the passage of the parts 28b of the members 28 into position as is indicated in dotted lines of Fig. 2 of the drawings.

With my improved ceiling, floor and roof construction, it will be understood that the cost of constructing ceilings, floors and roofs of buildings may be materially reduced in the saving of labor heretofore required in placing the usual floor beams and the like in position, and further in eliminating all plastering and similar operations which is a common practice; and in addition to the saving of manual labor, a saving in material is also effected and the resulting structure is rendered fireproof.

It will also be apparent that my invention is not necessarily limited to the use of sections 12 of any limited length or width, it being understood that any number of the ribs 21—22 may be employed, but it is preferred to construct these sections of such dimensions as to facilitate the handling thereof both from the standpoint of shipment and haulage as well as from the standpoint of placing the same in position in the construction of a building, and various other changes in and modifications of the construction herein shown and described may be made within the scope of the appended claims without departing from the spirit of my invention or sacrificing its advantages.

Having fully described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. A ceiling construction for buildings comprising a plurality of ceiling forming sections arranged side by side and interlocked, said sections being of rib cross sectional form, a body of reinforced concrete adapted to be placed on said sections in forming the upper floor or roof surface to said ceiling, means at the ends of said sections for retaining the body of concrete outwardly of said ends and intermediate the ribbed portions of said sections, and the reinforcement of said concrete involving rod members arranged in a plurality of the ribs of said sections and extending from one rib to an adjacent rib.

2. A concrete ceiling structure of the class described fashioned from a plurality of ribbed bodies of sheet material, the ribs being arranged longitudinally of and spaced transversely of said bodies, the side edges of the separate bodies interlocking to form a continuous sleeve structure, the ribs of which form beams on the lower face of the ceiling structure, means at the ends of said bodies for finishing a ceiling structure intermediate said ribs, concrete arranged upon said bodies and within the ribs thereof and disposed at the ends of said bodies, and reinforcing rods arranged in said ribs and extending through the end portions thereof into adjacent ribs to aid in interlocking said bodies one with the other and to reinforce the concrete.

3. In a ceiling construction of the class described, a ceiling forming member comprising a sheet of predetermined material fashioned to form longitudinally arranged and transversely spaced ribs projecting from the lower face of said sheet, the channels of said ribs opening upwardly and outwardly through the ends of said sheet, means fashioned from the material of said sheet at one end thereof for forming end wall members arranged intermediate said ribs, one side of said sheet terminating in an up-

wardly extending wall of one of said ribs and the other side of said sheet terminating in a downwardly extending wall member adapted to enter the channel of the rib of the first named side of an adjacent sheet in the construction of a ceiling, and the vertical walls of said ribs having notches at one end of said sheet for receiving and supporting reinforcing members.

In testimony that I claim the foregoing as my invention I have signed my name this 11th day of October, 1928.

RICHARD MURRAY.

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