Dec. 8, 1925. 1,564,264

R. MURRAY

CONCRETE FLOOR AND CEILING CONSTRUCTION

Filed Nov. 17, 1924

Fig. 1

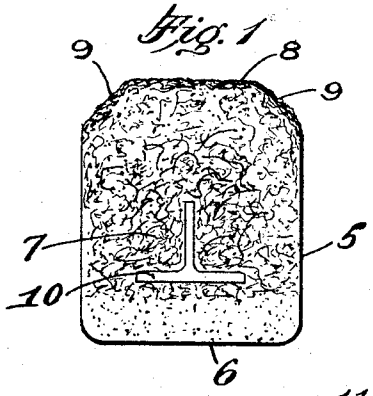
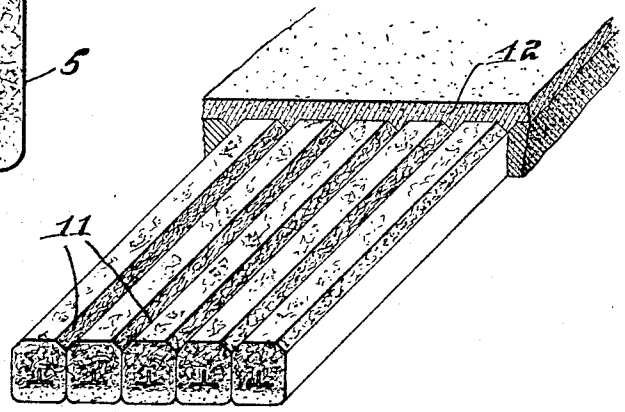


Fig. 2



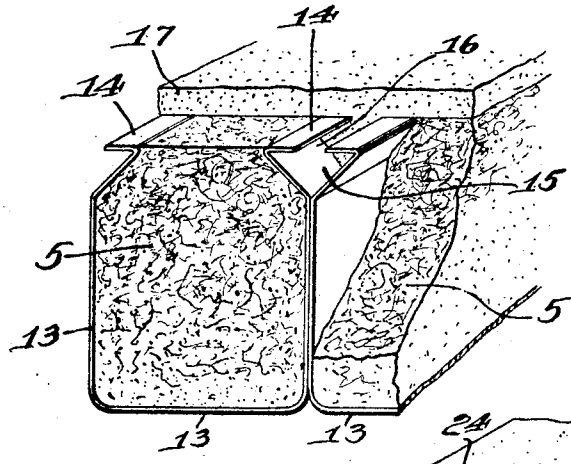
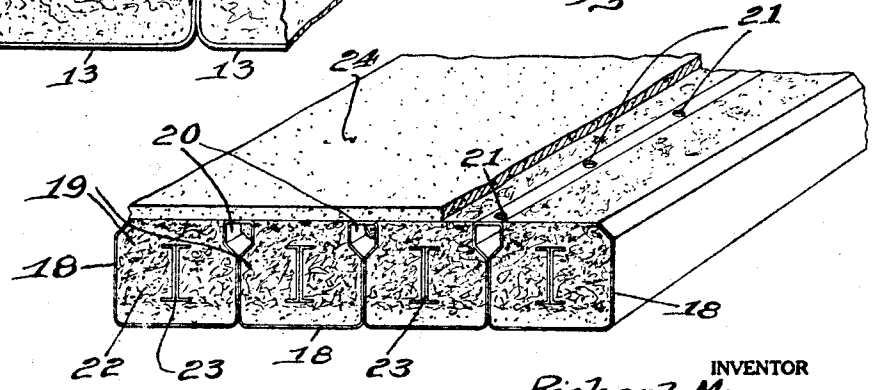


Fig. 3

Fig. 4



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UNITED STATES PATENT OFFICE.

RICHARD MURRAY, OF NEW YORK, N. Y.

CONCRETE FLOOR AND CEILING CONSTRUCTION.

Application filed November 17, 1924. Serial No. 750,275.

To all whom it may concern:

Be it known that I, RICHARD MURRAY, a citizen of the United States, and residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Concrete Floor and Ceiling Constructions, of which the following is a specification, such as will enable those skilled in the art to which it appertains to make and use the same.

This invention relates to the construction of the floors and ceilings of buildings of concrete, and particularly by the provision of reinforced concrete beams which may be placed side by side in the construction of a floor and ceiling and which may be made up into comparatively wide sections employing the equivalent of two or more beams, said sections being placed side by side; and the object of the invention is to provide an elongated body of concrete, in the form of a beam, said concrete body being composed of cement and sand or similar material to form a desirable concrete mixture and in the formation of said body, cotton waste or other fibrous strands as well as steel wool, may be separately or collectively imbedded in the mass to form a filler and binder therefor, and if desired, rags may be used, and waste paper reduced to a pulp or a substantial pulp may be employed; a further object being to provide a concrete body or beam of the class specified in which a suitable metallic reinforcing member or members may be employed to give greater strength and durability to the finished product; a still further object being to provide a body or beam of the class specified with a sheet metal facing to give greater strength to the finished product as well as to produce a smooth and finished ceiling surface which may be painted or otherwise decorated; and with these and other objects in view, the invention consists in the means hereinafter described for constructing the floor and ceiling structure of a building, eliminating the use of the present floor beams, girders and the like, and the means employed being simple in construction, efficient in use and constructed as hereinafter described and claimed.

The invention is fully disclosed in the following specification, of which the accompanying drawing forms 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 an end view of one form of beam made according to my invention.

Fig. 2 is a perspective view illustrating the method of assembling a number of the beams shown in Fig. 1 and the construction of the floor surface on said beams, part of the construction being shown in section.

Fig. 3 is a view similar to Fig. 2 on an enlarged scale and showing a modification; and,

Fig. 4 is a view similar to Fig. 2 but showing another modification.

In the present procedure of constructing the ceilings and floors of buildings, it is customary to provide floor beams or girders, to which the ceiling is attached by different kinds of lathe and upon which the floor surface is constructed, and my invention consists in eliminating this method of procedure which is expensive by reason of the numerous operations to be formed and the labor time required to accomplish the desired result.

In carrying my invention into effect as shown in Figs. 1 and 2 of the drawing, I form by the use of a suitable mold an elongated body of concrete 5 in the form of a beam which may be of predetermined width and height, in cross section and may be made in predetermined lengths to permit of its placement upon the upstanding walls of a building or the framework thereof, it being understood that the beams 5 will be used in substantially similar manner to the use of floor beams under the present well-known construction. The lower face 6 of the beam 5 is smooth and unobstructed and composed of a suitable concrete mixture which may be given a suitable color if desired, and a predetermined distance from the lower face 6, the body portion of the beam

has imbedded therein, strands of cotton waste or steel wool or rags or bodies of waste paper reduced to a pulp or a substantially pulp-like substance, or if desired any combination of similar fibrous or metallic strands may be employed and used as a filler or binder. It is preferred that the upper face portion 8 of the beam 5 be beveled at the side corner portions thereof as illustrated at 9 and also it is preferred that some of the filler and binder elements be exposed through said face for the purpose hereinafter set out. A reinforcing member, such for example as a T-bar 10 may also be mounted and imbedded within the concrete body or beam 5 to increase the strength and durability thereof.

In Fig. 2 of the drawing, I have shown a number of beams 5 mounted side by side in the construction of a floor and ceiling, and it will be seen that the faces 6 are directed downwardly while the faces 8 are directed upwardly and the beveled corners 9 of adjacent beams form substantially V-shaped recesses 11 in the top face of said beams and after the required number of beams have been mounted in position to produce or complete the floor structure as well as the ceiling of a predetermined building or a part of such building, a suitable floor covering may be placed upon the upper faces 8 of the beams 5 to complete the floor surface while the lower faces 6 may complete the ceiling of the floor below and may be painted or otherwise ornamented if desired or may be left plain and the color applied to the cement or concrete be maintained as a ceiling coloring. In Fig. 2 of the drawing, I have shown a concrete floor facing 12 applied to the top faces of the beams 5, and this concrete facing extends into the recesses 11 and adheres to the exposed fibrous or other filler and binder of the separate beams, thus producing a strong and durable as well as fire-proof floor and ceiling construction.

It will be apparent that the beams 5 may be made of any desirable and practical length and may be placed end to end as well as side by side, and said beams extending from one of the main frame beams or girders of the building to another, or from one side wall to a partition wall or other side wall of a building as will be apparent. It will also be understood that the beams 5 may be of any desired dimensions in cross section, it being preferred that said beams being in the neighborhood of a foot in transverse width and of the required height to produce a strong and durable construction for the specific purpose for which it is intended, and the reinforcement 10 employed when desired and of such strength as to meet the demands.

In Fig. 3 of the drawing, I have shown a modification in which the beam 5 is not provided with the reinforcement 10 and mounted on the bottom and side faces of the beam is a sheet metal facing 13, the upper end portions of which terminate in laterally directed flanges 14 which form between adjacent beams, recesses 15 opening outwardly through the top thereof as shown at 16. With this construction, it will be understood that the concrete and other filler and binder is formed within the casing or facing 13, the latter serving as a mold for this purpose, and it will also be understood that other reinforcing and binding means may be employed within the concrete mass if greater strength or durability is required, and with this construction the facing produces the finished facing of the ceiling of the floor construction and may, if desired, be painted or otherwise ornamented.

In laying the concrete floor 17 upon the beams 5 shown in Fig. 3 of the drawing, the concrete passes into the recesses 15 between the adjacent beams through the opening 16 and forms an anchor for the floor facing or covering 17. It will be understood however, that any desirable type of floor facing may be employed.

In Fig. 4 of the drawing, I have shown another modification in which I provide a form 18 preferably composed of sheet metal and fashioned to form a plurality of similar elongated compartments 19 which are substantially rectangular in form in cross section. The side walls of the separate compartments are integral and are adjacent except at the upper end portions thereof, at which points the sheet is fashioned to form longitudinal chambers 20 and the top walls of said chambers are apertured as indicated at 21 for the purpose hereinafter set out.

It will be understood that the sheet 18 may be cut and fashioned to form two or more compartments 19 and in practice the concrete and binder material or body is placed in said compartments as in the constructions shown in Figs. 1 and 3 or in the construction of reinforced concrete beam members 22 which lie adjacent each other within the chambers 19 and which constitute a unitary construction, any number of which units may be employed in the construction of the floors and ceilings of a building. In Fig. 4 of the drawing, reinforcing members in the form of I-beams 23 are shown imbedded in the concrete bodies or beams 22 instead of the reinforcing members 10 as shown in Figs. 1 and 2, but these members may or may not be employed, depending upon the type of building and floor construction desirable therefor. With this construction, the metal sheet 18 forms facings and reinforcements for the beams 22 and also serves to link or couple the sep-

arate beams together as above set out, and in completing the floor structure, a suitable flooring may be mounted upon and secured to the upper faces of the beams 22 or the unitary constructions formed thereby as shown in Fig. 4 and in said figure I have shown a concrete floor surface 24 mounted upon the beams 22 and in the application of said floor surface 24, the concrete passes downwardly into the chambers 20 through the apertures 21 and serves as a secure anchor for the concrete floor body 24 and the exposed fibrous or other binding and filling material will also aid in the adhesion or anchoring of said floor surface. The bottom faces or ceiling forming portions of the units or the separate beams thereof may be painted or otherwise fashioned to produce a desirable ceiling finish.

With the construction shown in Fig. 4 of the drawing, the separate units may be constructed at a suitable factory and shipped to the place where the same are to be used in the construction of the floors and ceiling of a building, or if desired the sheet metal frame fashioned to form the compartments 19 and chambers 20 therein may be set in place in the construction of a building and the concrete binding, filling and reinforcing material placed therein, and the finished floor surface applied in one operation, and this is also true of the construction shown in Fig. 3 of the drawing.

With my improved means for constructing the floors and ceilings of buildings, I produce a strong and durable construction at a nominal cost as compared with the present method of procedure, and also produce a fireproof structure, and while I have shown certain methods of carrying my invention into effect and have referred to the use of specific reinforcing binding and filling material it will be understood that I am not necessarily limited to the specific construction herein set out, and various changes therein and modifications thereof, 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 beam of the class described composed of an elongated body of concrete and a binder of fibrous material imbedded in and constituting part of said body, steel wool imbedded in said body as a binder and filling, a reinforcing beam imbedded in said concrete body, and a metal facing for the major portion of said body.

2. A beam of the class described comprising an elongated body of concrete substantially rectangular in form in cross section, a binder of fibrous material molded within said beam and exposed through predetermined surfaces thereof whereby a body of concrete placed on said beam may adhere thereto, and a metallic beam imbedded in and extending longitudinally through said body.

3. A beam of the class described composed of an elongated body of concrete having a binder imbedded therein throughout its entirety, a sheet metal body enclosing three side faces of said concrete body and fitting snugly thereon to form a metallic facing and reinforcement for said body, and the ends of said sheet metal body being flanged outwardly and horizontally to form recesses at the opposite sides of and extending longitudinally of said beam.

4. A floor and ceiling construction fashioned from a plurality of beam members mounted side by side and in juxtaposition, said members being composed of concrete bodies having a binder and filler imbedded therein and exposed through the top faces of said members, and a floor facing mounted upon the top of said beams and adhered thereto by the exposed binder and filler of said beams.

5. A floor and ceiling construction fashioned from a plurality of beam members mounted side by side and in juxtaposition, said members being composed of concrete bodies having a sheet metal casing covering the bottom and side walls of said members and exposing the top wall thereof, the ends of said casing terminating in laterally projecting flanges which form between the adjacent faces of said beam members when mounted in position, recesses, and a floor facing adapted to be placed on the top face of said beams and secured thereto by parts extending into said recesses.

6. A floor and ceiling construction fashioned from a plurality of beam members mounted side by side and in juxtaposition, said members being composed of concrete bodies having a sheet metal casing covering the bottom and side walls of said members and exposing the top wall thereof, the ends of said casing terminating in laterally projecting flanges which form between the adjacent faces of said beam members when mounted in position, recesses, a floor facing adapted to be placed on the top face of said beams and secured thereto by parts extending into said recesses, and said concrete bodies having imbedded therein interengaging strands of binding material.

7. A floor and ceiling construction fashioned from a plurality of beam members mounted side by side and in juxtaposition, said members being composed of concrete bodies having a sheet metal casing covering the bottom and side walls of said members and exposing the top wall thereof, the ends of said casing terminating in laterally pro-

jecting flanges which form between the adjacent faces of said beam members when mounted in position, recesses, a floor facing adapted to be placed on the top face of said beams and secured thereto by parts extending into said recesses, said concrete bodies having imbedded therein interengaging strands of binding material, and a metallic beam imbedded in said concrete bodies centrally thereof and extending longitudinally therethrough.

In testimony that I claim the foregoing as my invention I have signed my name this 12th day of November, 1924.

RICHARD MURRAY.