Sept. 27, 1938. J. H. YOUNG 2,131,652

COMPOSITE FLOOR FOR BUILDINGS AND LIKE STRUCTURES

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Fig. 1.

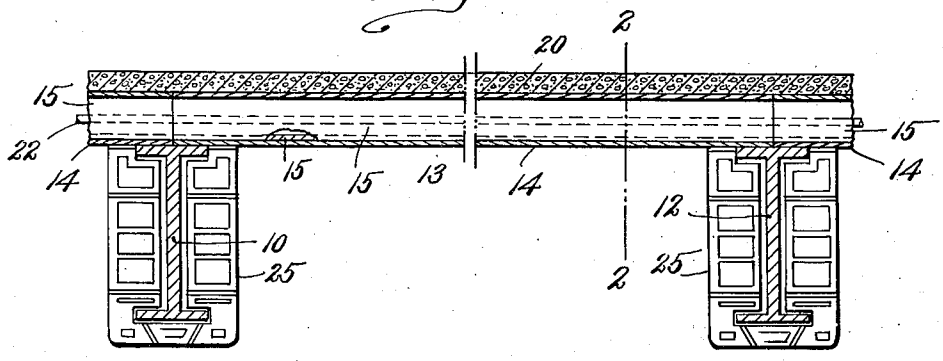
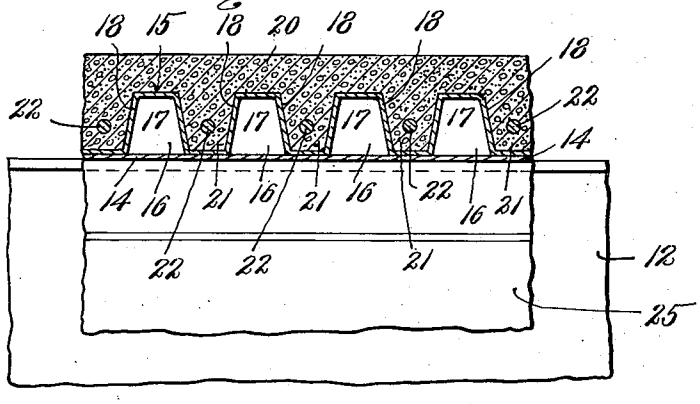


Fig. 2.



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COMPOSITE FLOOR FOR BUILDINGS AND LIKE STRUCTURES

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1 Claim. (Cl. 72—70)

This invention has for its object to provide a building or other structure with a composite floor of minimum thickness having a fully fire-resisting upper member of concrete or like fire-resisting material, and a metal lower member composed of metal sheets of such construction as to form a permanent part of the building and provide a permanent form upon which the concrete may be poured, and one of which provides for the proper depth and strength of the concrete member, and the other of which provides for a substantially flat ceiling and raceways or ducts between the ceiling and the concrete member, which ducts or raceways are readily accessible from above and below the composite floor.

To this end the metal lower member may be provided with a substantially flat lower metal sheet and a corrugated upper metal sheet, which sheets are supported upon beams, girders or other supporting members to form a permanent part of the building.

The upper corrugations of the corrugated metal sheet are designed to be filled with concrete and form ribs on the underside of a concrete slab, which latter may be made of any thickness required by the authorities. The upper corrugations are made of substantial depth and have laid in them metal rods or other metal reinforcement for the concrete ribs.

The lower substantially flat metal plate or sheet cooperates with the lower corrugations to close them and form ducts or raceways for electric wires, and also forms a ceiling plate or sheet which provides the room or space below the composite floor with a substantially flat metal ceiling which can be painted or otherwise finished.

The ducts or raceways may be entered from above through holes or openings extended down through the concrete member and through the top walls of the ducts or raceways, or they may be entered from below through the ceiling sheet.

The metal ceiling sheet and the corrugated upper sheet co-operate to form a permanent form of the desired strength to sustain the load of concrete poured upon them, and also co-operate to provide the composite floor of the building with ducts or raceways, which enable electric wires to be distributed in the floors of the building in a manner best adapted to the requirements of the users of the building.

These and other features of the invention will be hereinafter described and pointed out in the claim at the end of this specification.

In the accompanying drawing, Fig. 1 represents a sufficient portion of a building and a floor thereof, to enable the invention to be understood, and Fig. 2 is an enlarged section taken on the line 2—2 of Fig. 1.

Referring to the drawing, 10, 12 represent two beams, girders or like floor supporting members, which are such as now commonly used in the construction of buildings having a steel or other metal framework.

The supporting members 10, 12 which will be hereinafter referred to as beams, may be of any desired number for each floor of the building, depending upon the width and length of the latter.

In the present instance, two beams are shown, as it is believed that this number is sufficient to enable the invention to be clearly understood.

The beams 10, 12 are separated by a substantial space 13, which is covered by the improved floor, and to this end the beams 10, 12 support the opposite ends of a metal sheet 14, which constitutes the ceiling metal sheet of the improved floor.

The ceiling metal sheet 14 has superimposed upon it a corrugated metal sheet 15, which is of substantially the same length as the ceiling metal sheet 14 and has its opposite ends extended over and supported by the beams 10, 12. The corrugated metal sheet 15 is provided with corrugations, preferably of the shape herein shown, and alternate corrugations 16 on the underside are normally open, and are closed by the ceiling metal sheet 14 to form ducts or raceways 17, which alternate with corrugations 18 open at their upper ends.

The ceiling metal sheet 14 and the corrugated metal sheet 15 are designed to form a permanent part of the building and may be secured to the supporting beams 10, 12 in any suitable manner. The corrugated upper sheet 15 is designed to form a permanent form upon which is poured concrete or other fire-resisting material, to form a concrete floor preferably comprising a substantially flat slab 20 having ribs 21 projecting from its underside, which ribs are formed by the concrete which fills the open corrugations on the upper side of the corrugated sheet 15.

The concrete floor is reinforced by metal rods 22 or other metal reinforcing means which are laid in the open upper corrugations and suitably arranged therein before the concrete is poured on the corrugated metal sheet 15. Sufficient concrete is used to form a concrete floor capable of itself sustaining the loads placed upon it and which also is fully fire-resisting independently of the metal sheets.

It is preferred to make the concrete floor with a slab of a thickness at least two inches above the upper or top walls of the cells or ducts 17 to satisfy the requirements of the building codes now called for by the authorities in this country. In Fig. 1, the span or space between the beams 10, 12 is covered by a continuous ceiling metal sheet 14 and a corrugated metal form sheet 15, which have their opposite ends extended over and supported by the beams 10, 12, which also support the ends of the metal sheets 14, 15, which cover adjacent spans or spaces, with the ducts or raceways 17 in alignment, so as to form continuous ducts or raceways through which electric wires may be fished or run from above the concrete floor slab through holes made in the slab and in the top walls of the ducts or raceways, or the latter may be directly entered from below the concrete floor through holes made in the ceiling metal sheet 14.

From the above description, it will be seen that by means of the present invention the building may be provided at a minimum cost with floors of a minimum thickness which are not only fully fire-resisting and of the proper load-carrying capacities but are also provided with ducts or raceways through which electric wires may be led into the building from above or below the floors and enable the electric service of the building to be adapted to the requirements of the users of the building.

The metal beams 10, 12 are protected from fire by suitable fire-resisting material 25 which may be of any suitable or desired construction such as now commonly used.

What is claimed is:

In a fire proof building structure, in combination, two steel floor supporting members spaced apart and a unitary composite concrete and metal floor operatively supported upon said steel supporting members, said floor comprising a lower steel sheet forming a substantially flat ceiling member and supported directly upon the metallic supporting members, a corrugated upper steel sheet welded to the lower steel sheet to form therewith a load carrying member having a plurality of spaced apart and longitudinally extended cells forming hollow load supporting beams and also potential wire distributing raceways, a slab of concrete filling the open corrugations in said upper steel sheets and extended sufficiently above the top of said raceways as to afford required fire proofing therefor, and fire proofing means around the sides and bottom of the said metal floor supporting members whereby the metal floor supporting members are efficiently fire proofed by the concrete slab and said fire proofing means.

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