

C. T. McFARLAND,
BUILDING CONSTRUCTION,
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Patented Jan. 22, 1918.

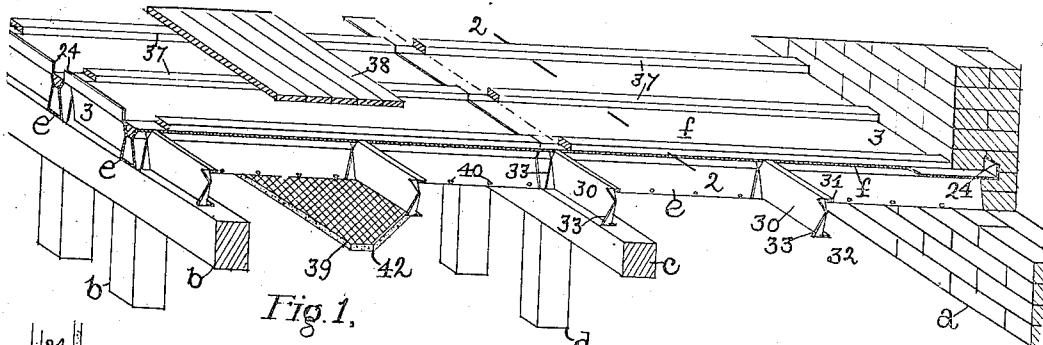


Fig. 1.

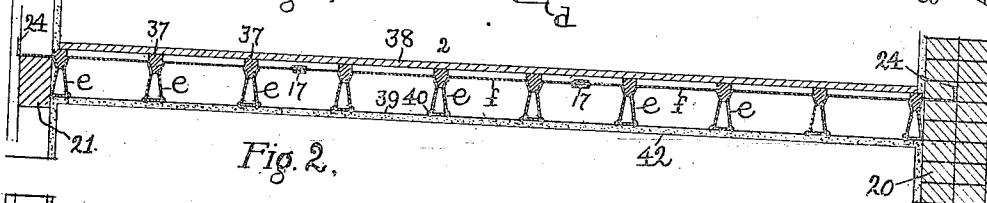


Fig. 2.

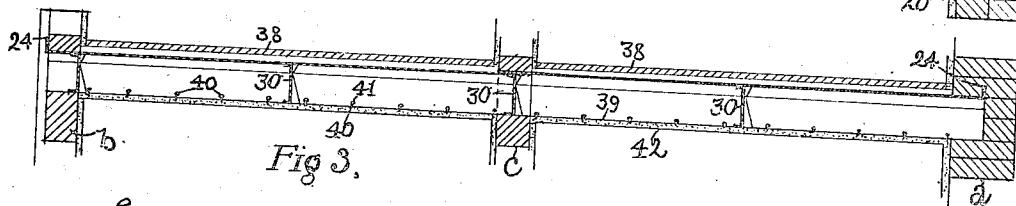


Fig 3.

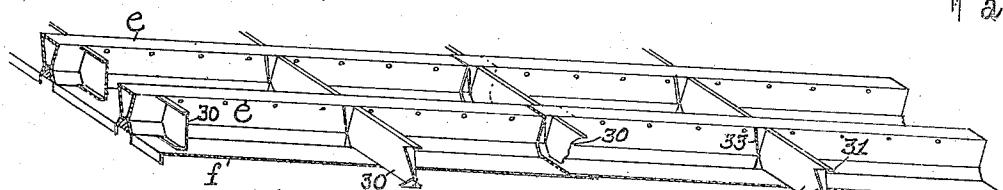


Fig. 4.

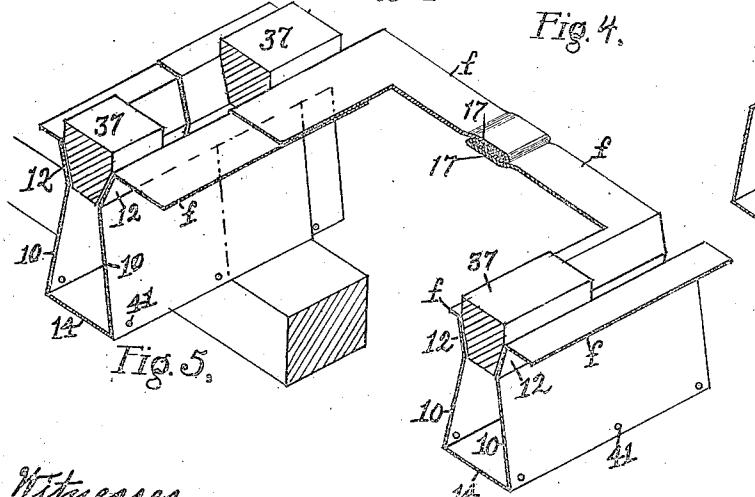


Fig. 6.

Witnesses.

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BUILDING CONSTRUCTION.

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To all whom it may concern:

Be it known that I, CLARENCE T. McFARLAND, a citizen of the United States, residing in Boston, county of Suffolk, and State 5 of Massachusetts, have invented an Improvement in Building Constructions, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings 10 representing like parts.

This invention relates to a composite building construction and more particularly to the floors and ceilings of the same.

The invention is adapted to be embodied 15 in buildings having brick and like outside walls, and is particularly adapted to be embodied in buildings having wooden frames.

The invention has for its object to provide a superior floor construction with 20 which a wooden, brick or like building may be provided with a light weight metal floor, which is continuous from wall to wall, and serves as a fire stop and also to render the building rat and vermin proof, as will be 25 described.

The improved floor construction also enables a material saving in the height and cost of the building to be effected without sacrificing head room between the different 30 floors, as will be described.

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

Figure 1 represents a sufficient portion of 35 a building embodying this invention to enable it to be understood.

Fig. 2, a section of the building shown in Fig. 1 taken on the line 2—2.

Fig. 3, a section on the line 3—3 Fig. 1.

Fig. 4, a perspective of the floor plates 40 shown in Fig. 2 inverted.

Fig. 5, an enlarged detail to be referred to, and

Fig. 6, a detail of a reinforcement to be 45 referred to.

In the present instance, I have shown the invention as embodied in a building having one side wall *a* of brick or like material, and the opposite side wall *b* of wood, with 50 an intermediate partition cap *c* supported upon post *d*.

In accordance with this invention, the

outside walls *a*, *b* and the partition cap *c*, support a sheet metal floor structure preferably of the construction herein shown, and 55 comprising a plurality of sheet metal beams *e*, and connecting plate members *f*. The sheet metal beams *e* may and preferably will be made of the cross section herein shown, see Fig. 5, and consisting of side 60 walls and a connecting wall. The side walls are composed, as herein shown, of converging members or sections 10, and diverging members or sections 12, which extend from the converging members 10, and from which 65 extend the floor members *f*, the converging members 10 being connected by the wall 14, which forms a substantially wide bearing for the beam. It is preferred to make the members 10 of the side walls materially 70 longer or larger than the members 12.

A plurality of the hollow sheet metal beams *e* may be rolled, pressed up or otherwise formed from a flat metal sheet, with floor members *f* connecting the side walls 75 of adjacent beams. In the present instance the floor is made up of two halves or members each comprising three metal sheets, one of which is provided with four metal beams and each of the other two with three 80 metal beams. A floor of sheet metal is thus formed, which comprises a plurality of sheet metal beams and one or more connecting plates *f*, and adjacent floor sheets may have their adjacent floor members *f* 85 secured together, which may be effected in any suitable manner but preferably by providing said floor members with bent flanges or lips 17, which are capable of being interlocked with unskilled labor on the job after 90 the manner shown in Figs. 2 and 5, so as to make a continuous floor sheet extended in one direction of the building, as for instance in the direction of the length thereof from one end wall 20 to the other end wall 95 21, see Fig. 2.

The floor sheets may be arranged as herein shown, so that the beams of the said sheets extend transversely of the building, as represented in Figs. 1 and 3, and in the 100 present instance two floor sheets are employed to cover the space between the walls *a*, *b*, and each floor sheet has one end of its beams resting on one of the side walls *a*, *b*,

and its other end on the partition cap *c*, and the beams of one of the floor sheets are contracted so as to dovetail into the beams of the other floor sheet supported by the partition cap, as clearly shown in Fig. 1. In this manner the building is provided with a practically continuous sheet metal floor extended from one side wall as *a* to the other side wall *b* of the building and from one end wall 20, to the other end wall 21 and is supported by said side and end walls. The floor members *f* of the floor sheets may be provided with upturned lips 24, which serve as anchoring devices to secure the floor sheets to the side and end walls of the building, see Figs. 1, 2 and 3.

The sheet metal floor may be reinforced by bridging members, which may be of wood but are preferably of sheet metal and made as herein shown, each consisting of a vertical web 30 having top and bottom flanges 31, 32 and end flanges 33, the ends of said sheet metal bridging members being shaped to conform to the shape of the sides 10, 12 of the beams, so that the bridging members can be slipped between and be supported by the adjacent sides of two beams, as represented in Figs. 1 and 4.

The flanges 33 of the bridging members afford a sufficiently broad bearing surface for the bridging members to be maintained in an upright position without otherwise fastening them to the sheet metal beams.

The sheet metal floor is shown in Fig. 1 in its normal position, and in Fig. 4 in an inverted position, to enable the construction to be clearly shown and understood.

The hollow sheet metal beams may and preferably will have extended into them, so as to rest upon the diverging members 12 of the side walls of said beams, filler strips or pieces 37 of wood, or other suitable material, which project above the beams and form supports for the floor boards 38, to which the latter may be nailed or otherwise secured.

The metal beams *e* may have secured to them wire lathing 39, which may be fastened by tie wires 40, which are passed through holes 41 in the side walls of the beams near the lower edges of the same.

A layer 42 of plaster may be applied to the wire lathing 39 in the usual manner. If desired the side walls 10, 12 of the sheet metal beams may be reinforced by sheet metal shoes 44, see Fig. 6, which are shaped to conform to the shape of the larger portion of the beam, so that the said shoes can be slipped into or over the beams as desired and fastened in any suitable manner as for instance by spot welding or riveting.

The wooden strips or nailers 37, may be nailed or otherwise secured in fixed relation to the beams, and they may be flush with or project above the beams. The sheet metal

beams may be of less depth than that required in wooden construction, span for span, thus saving in height of walls, without sacrificing head room between floors, and also effecting a material saving in the cost of the building. 70

By reference to the drawing, it will be seen that the sheet metal floor runs from wall to wall and over partition caps, thereby eliminating the necessity for the usual fire stopping, and making the building practically rat and vermin proof, and further serves to stop the travel of fire and smoke from one floor to another. 75

Where plumbing and heating pipes are run through the floors, suitable holes may be cut in the floor members *f*, and if the holes are sufficiently large to weaken the said members, the latter can be strengthened around the holes in any suitable manner. 80 The sheet metal floor construction is especially adapted for use in buildings having wooden floors, but it is also capable of being used in buildings having concrete floors, in which case, the nailer strips 37 are omitted, 85 and the hollow beams are filled with concrete or the like, and the floor members *f* serve as forms to support the concrete, thereby avoiding the use of temporary forms. When used in a building having a concrete floor, the floor members *f* may be slit or expanded to better engage the concrete. In practice, the sheet metal beams are made of sufficient depth to sustain a given load on a substantially long span, and are separated from one another by substantial spaces. For ordinary spans, which range from 8 to 20 feet, a beam of a depth of from 4 to 16 inches is preferred and a separation of from 10 to 16 inches on centers. 90 100 105

Claims:-

1. In a building construction, in combination, a sheet metal floor plate comprising a plurality of beams and intermediate plate members of greater width than said beams, the latter having converging side wall members forming the lower part of the beam and shorter diverging members forming the upper part of the beam and separated at their widest part a distance which is less than the width of the lower part of the beam at its greatest width, said intermediate plate members being wider than the depth and width of the beam. 110 115 120

2. In a building construction, in combination, a sheet metal floor comprising a plurality of sheet metal beams having adjacent side walls separated from each other and integral with intermediate plate members of a greater width than said beams, 120 nailer strips interposed between and supported by the side walls of said beams, and a flooring secured to said nailer strips. 125

3. In a building construction, in combination, a sheet metal floor plate comprising 130

a plurality of beams integral with intermediate plate members of greater width than the depth of said beams, the latter having converging side wall members and shorter diverging members, and a nailer strip supported by the diverging members.

5 In testimony whereof, I have signed my

name to this specification in the presence of two subscribing witnesses.

CLARENCE T. McFARLAND.

Witnesses:

JAS. H. CHURCHILL,
J. MURPHY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."