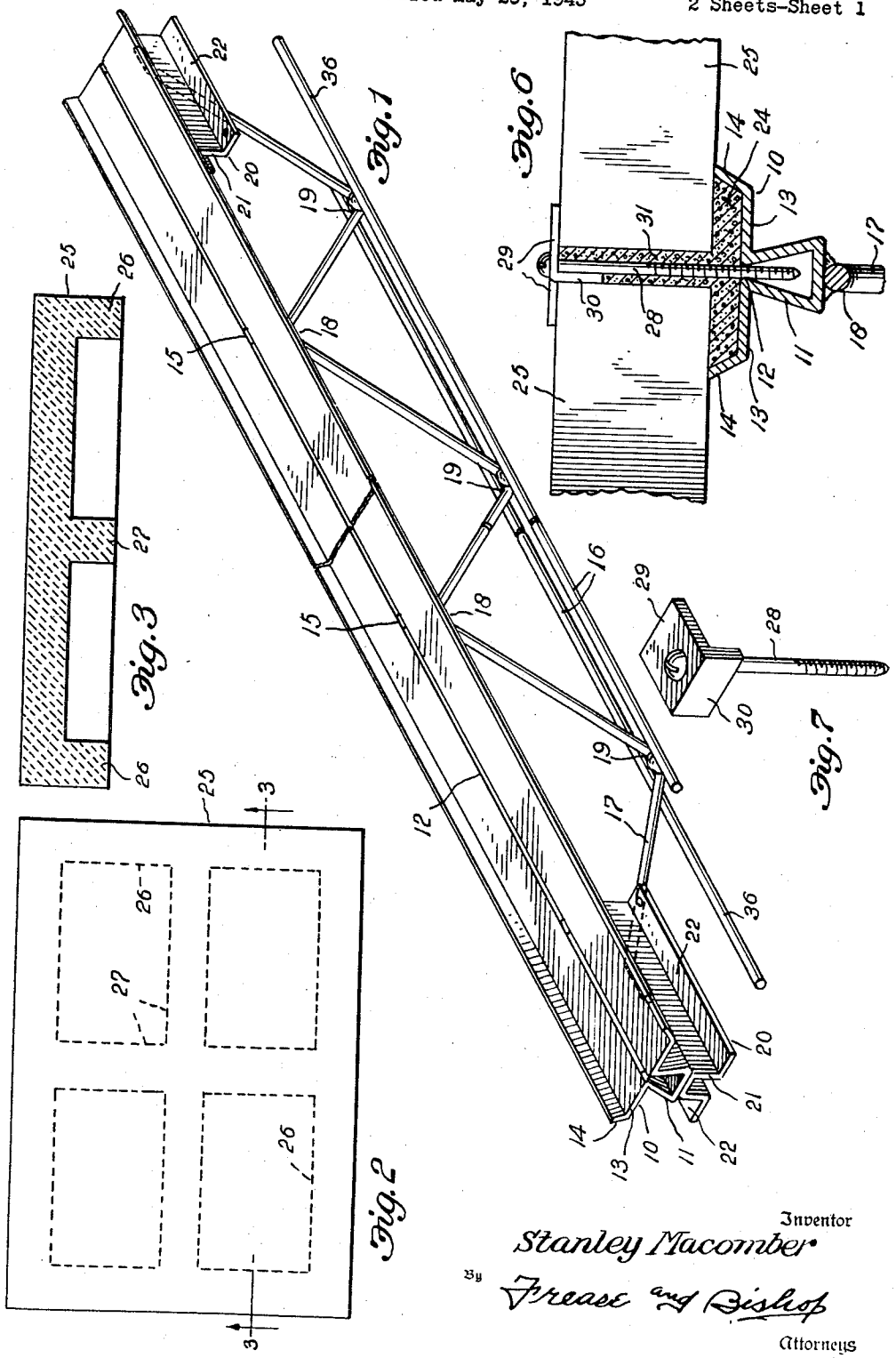
April 20, 1948. S. MACOMBER 2,440,053

FLOOR TILE AND JOIST CONSTRUCTION

Filed May 29, 1945 2 Sheets-Sheet 1



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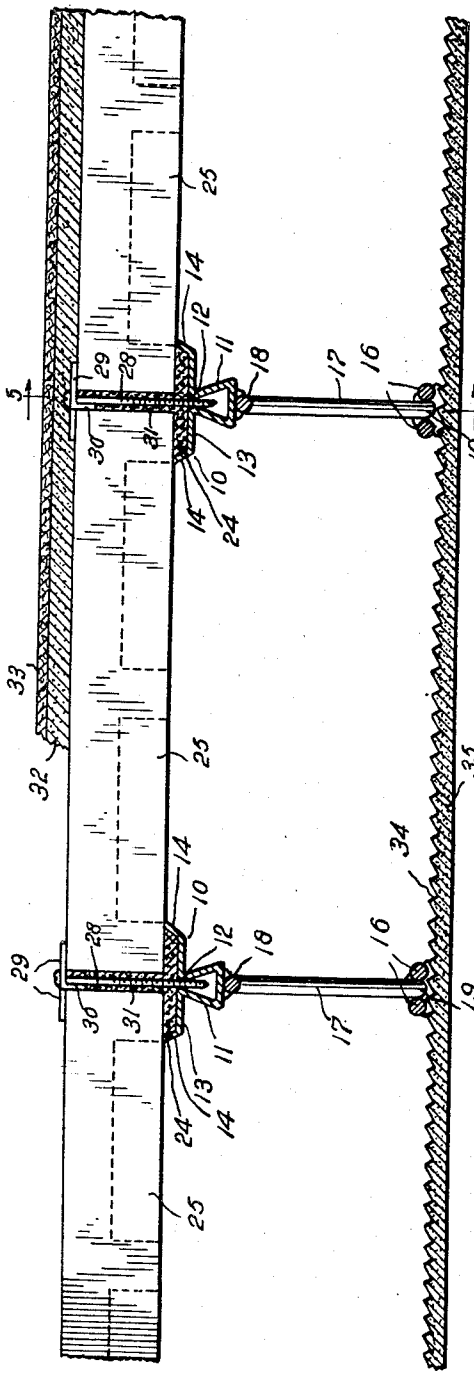


Fig. 4

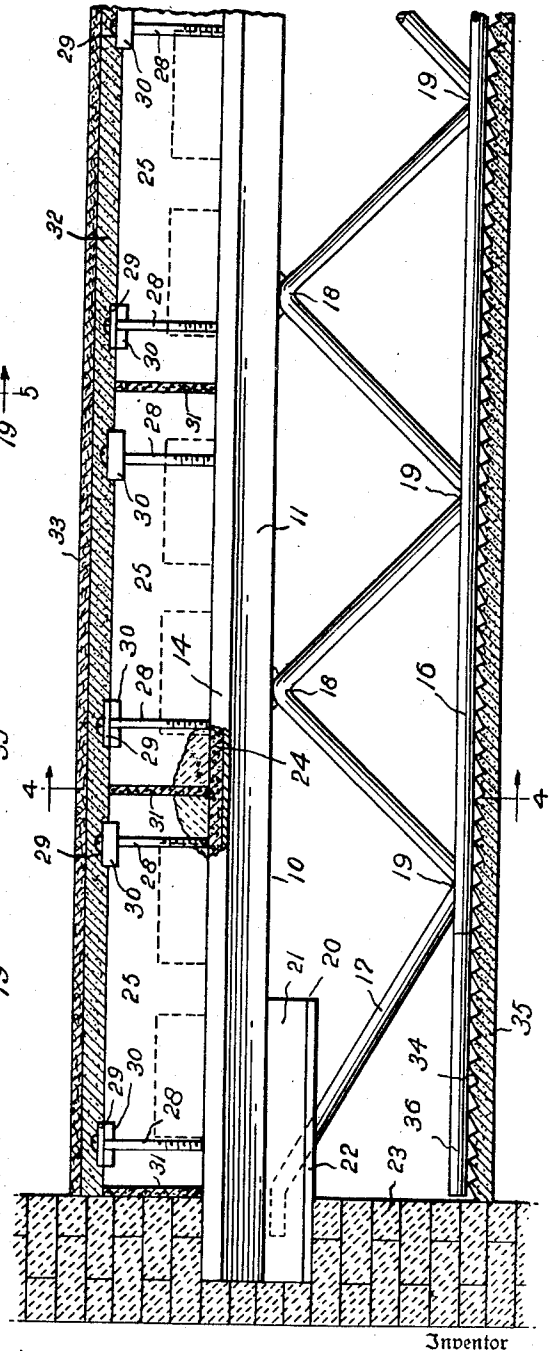


Fig. 5

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FLOOR TILE AND JOIST CONSTRUCTION

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Application May 29, 1945, Serial No. 596,436

7 Claims. (Cl. 72—67)

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The invention relates to a floor construction including a novel form of floor joist and a floor tile for supporting the floor area between joists.

The object of the invention is to provide a floor construction including a floor joist having a V-section top chord, and floor supporting tiles of a length to span the space between joists, the tiles being connected to the joists by means of screws or the like located between the opposed faces of adjacent tiles and inserted into the V-section top chord of the joist.

Another object is to provide a new floor joist having a V-section top chord with a trough formed thereon to hold mortar upon which the ends of the floor supporting tile are bedded.

A further object is to provide a novel clip or washer for the attaching screw.

A still further object is the provision of a floor construction of this character in which a coat of mastic or the like is placed upon the top of the floor supporting tiles to compensate for any unevenness therein and provide a cushion upon which may be placed linoleum, floor tiles or other finish.

Another object of the invention is to provide a floor construction of this character in which a terrazzo coat may be placed upon the floor supporting tiles to compensate for unevenness therein and provide a smooth floor finish.

Still another object is to provide a floor construction of this character in which all cracks or joints between the floor supporting tiles are filled with mortar to form a solid, fire-proof masonry floor slab.

It is another object of the invention to provide a floor construction of this character in which the floor supporting tiles are made to a length fitting the spacing of the joists, and formed of any suitable fire resisting material such as clay, pre-cast cement, gypsum, asbestos, pressed wood pulp and the like.

Another object is to provide a rigid, economical, fireproof steel joist floor construction which may be constructed by inexperienced workmen, the quality of the floor not being dependent upon the workmen's ability to proportion and mix ingredients.

Still another object is to provide a floor construction of the character referred to in which the ceiling for the floor below may be constructed by welding or otherwise attaching metal lath to the bottom chords of the floor joists for attaching plaster or other suitable ceiling material.

The above objects, together with others which

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will be apparent from the drawings and following description, or which may be later referred to, may be attained by constructing the improved floor in the manner hereinafter described and illustrated in the accompanying drawings, in which

Figure 1 is a perspective view of one of the improved steel floor joists with V-section top chord having a mortar trough thereon;

Fig. 2 a top plan view of one of the floor supporting tiles for spanning the space between joists;

Fig. 3 a longitudinal sectional view through the tile taken as on the line 3—3, Fig. 2;

Fig. 4 is a sectional view through a portion of a floor constructed in accordance with the invention, taken as on the line 4—4, Fig. 5;

Fig. 5 a section through the improved floor taken as on the line 5—5, Fig. 4;

Fig. 6 an enlarged detail section showing the manner of attaching adjacent floor supporting tiles to the top chord of a floor joist; and

Fig. 7 a detached perspective view and one of the attaching screws and clips or washers for attaching the floor supporting tiles to the top chord of the floor joist.

The improved steel floor joist which forms a part of the new floor construction, includes a top chord indicated generally at 10 in the form of a V-section, structural member which may be rolled or otherwise formed from a strip or sheet of steel of necessary or desired gauge and width.

The central portion of the steel strip is formed into an inverted V or triangle 11, slightly spaced at its apex to form a central longitudinal groove 12, the strip being then bent outwardly in each direction providing the oppositely disposed lateral flanges 13 located in the same plane and terminating in the upturned angular flanges 14, providing a longitudinal trough extending throughout the length of said top chord member.

The groove 12 in the top chord member may be welded at spaced intervals, as shown at 15, to stiffen and reinforce the member and hold it rigidly in the formed position and to maintain the desired width of the floor.

The lower chord of the improved steel joist may be composed of two parallel, straight bars or rods 16, and the web member of the joist may be formed of a bar or rod 17 which is reversely bent to form a successive series of oppositely directed V's, the upper angles 18 of which are connected to the V-section top chord as by welding or the like, and the lower angles 19 of which may lie between the pairs of rods or bars 16 form-

ing the lower chord of the joist, being welded or otherwise connected thereto.

A bearing plate 20 is welded or otherwise attached to the under side of each end of the top chord 10 and may be shaped as shown in Fig. 1 of the drawings, comprising the central, inverted channel portion 21 which is attached to the under side of the top chord, and the outturned horizontal flanges 22 which may rest upon a bearing wall as indicated at 23 in Fig. 5, or other support for the ends of the joist. The ends of the web rod 17 may be welded or otherwise connected to these bearing plates.

In constructing a floor the improved floor joists above described are supported at spaced intervals and the trough portion 13—14 at the top of each top chord is filled with mortar as indicated at 24 in Figs. 4, 5 and 6, which may be applied with a trowel.

Floor supporting tiles 25, which may be formed of burned clay, pre-cast concrete, gypsum, asbestos, pressed wood pulp or other fire resisting material, made to a length fitting the spacing of the joists, are then laid and bedded on this mortar as shown in the drawings.

Each of these tiles may be of the shape best shown in Figs. 2 and 3, having the depending rim flanges 26 and the cross shape ribs 27 extending longitudinally and transversely through the center of the tile to stiffen and strengthen the same.

Metal screws 28, of sufficient length, with suitable washers or clips 29, are inserted between the ends of adjacent tiles 25 and screwed into the slot 12 of the top chord of the joist so as to hold the tiles firmly against the mortar bed 24.

Each of the clips or washers 29 as shown in the drawings, may have a depending flange 30 for insertion into the upper end of the joint between adjacent tiles 25, and these clips may be alternately turned in opposite directions as shown in the drawings so as to engage over the tops of both tiles at each joint.

All cracks and joints between the tiles may then be filled with mortar as indicated at 31 to form a solid, fire-proof masonry floor slab.

The slab thus formed may then be covered with a coat of mastic or the like as indicated at 32 to compensate for all unevenness in the tile surface and to form a cushion. Linoleum, floor tile or other suitable finish may then be placed upon the mastic cushion as indicated at 33.

If desired, the floor can be finished with a terrazzo coat placed directly upon the top of the supporting tiles 25 which will compensate for all unevenness in the surface of the tiles and provide a suitable finish. In this case of course, the mastic coat is not used.

For the purpose of providing a ceiling for the floor below, metal lath as indicated at 34 may be spot welded or otherwise connected to the lower chord member 16 to which may be applied plaster as indicated at 35 or other acceptable ceiling material. In order to complete the ceiling line to the walls, an extension 36 may be formed at each end of the lower chord or the conventional ceiling extension accessory or attachment may be provided for this purpose.

From the above it will be evident that a rigid, economical, fire-proof steel floor construction is provided which may be installed by inexperienced workmen and which is simpler and easier to construct than the usual metal lath and concrete slab floor and which may be installed at a smaller cost than equally effective fire resisting floors under present practice.

I claim:

1. A floor construction comprising spaced steel floor joists, each joist having a top chord in the form of a trough with a longitudinal slot therein, a mortar bed in each trough, floor supporting tiles spanning the space between joists and having their end portions bedded upon said mortar beds, metal screws located between opposed ends of adjacent tiles and driven into said slots, and clips at the upper ends of the screws engaging the top surfaces of the tiles for firmly fastening the tiles to the joists.

2. A floor construction comprising spaced steel floor joists, each joist including a top chord comprising a structural member formed of a strip of metal having its longitudinal central portion bent into triangular form with a narrow slot at the apex thereof, the edge portions of the strip being oppositely bent on each side of the slot forming substantially flat flanges having their edges bent upward forming a trough, a mortar bed in each trough, floor supporting tiles spanning the space between joists and having their end portions bedded upon said mortar beds, metal screws located between opposed ends of adjacent tiles and driven into said slots, and clips at the upper ends of the screws engaging the top surfaces of the tiles for firmly fastening the tiles to the joists.

3. A floor construction comprising spaced steel floor joists, each joist including a top chord comprising a tubular portion having a narrow slot therein, a trough formed upon the top of said tubular portion, a mortar bed in each trough, floor supporting tiles spanning the space between joists and having their end portions bedded upon said mortar beds, metal screws located between opposed ends of adjacent tiles and driven into said slots, and clips at the upper ends of the screws engaging the top surfaces of the tiles for firmly fastening the tiles to the joists.

4. A floor construction comprising spaced steel floor joists, each joist including a top chord comprising a structural member formed of a strip of metal having its longitudinal central portion bent into tubular form with a narrow slot at the apex thereof, the edge portions of the strip being oppositely bent on each side of the slot forming substantially flat flanges having their edges bent up forming a trough, a mortar bed in each trough, floor supporting tiles spanning the space between joists and having their end portions bedded upon said mortar beds, metal screws located between opposed ends of adjacent tiles and driven into said slots, and clips at the upper ends of the screws engaging the top surfaces of the tiles for firmly fastening the tiles to the joists.

5. A floor construction comprising spaced steel floor joists, each joist having a top chord in the form of a trough with a longitudinal slot therein, a mortar bed in each trough, floor supporting tiles spanning the space between joists and having their end portions bedded upon said mortar beds, and metal fastening members located between opposed ends of adjacent tiles and frictionally engaged in said slots and engaging the top surfaces of the tiles for firmly fastening the tiles to the joists.

6. A floor construction comprising spaced steel floor joists, each joist including a top chord comprising a structural member formed of a strip of metal having its longitudinal central portion

bent into tubular form with a narrow slot at the apex thereof, the edge portions of the strip being oppositely bent on each side of the slot forming substantially flat flanges having their edges bent up forming a trough, a mortar bed in each trough, floor supporting tiles spanning the space between joists and having their end portions bedded upon said mortar beds, and metal fastening members located between opposed ends of adjacent tiles and frictionally engaged in said slots and engaging the top surfaces of the tiles for firmly fastening the tiles to the joists.

7. A floor construction comprising spaced steel floor joists, each joist including a top chord comprising a structural member formed of a strip of metal having its longitudinal central portion bent into triangular form with a narrow slot at the apex thereof, the edge portions of the strip being oppositely bent on each side of the slot forming substantially flat flanges having their edges bent upward forming a trough, a mortar bed in each trough, floor supporting tiles spanning the space between joists and having their end portions bedded upon said mortar beds, and metal fastening members located between opposed ends of adjacent tiles and frictionally engaged in said slots and engaging the top surfaces of the tiles for firmly fastening the tiles to joists.

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