March 7, 1933. W. D. JARVIS 1,900,346

ROOF AND FLOOR STRUCTURE

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Fig. 1.

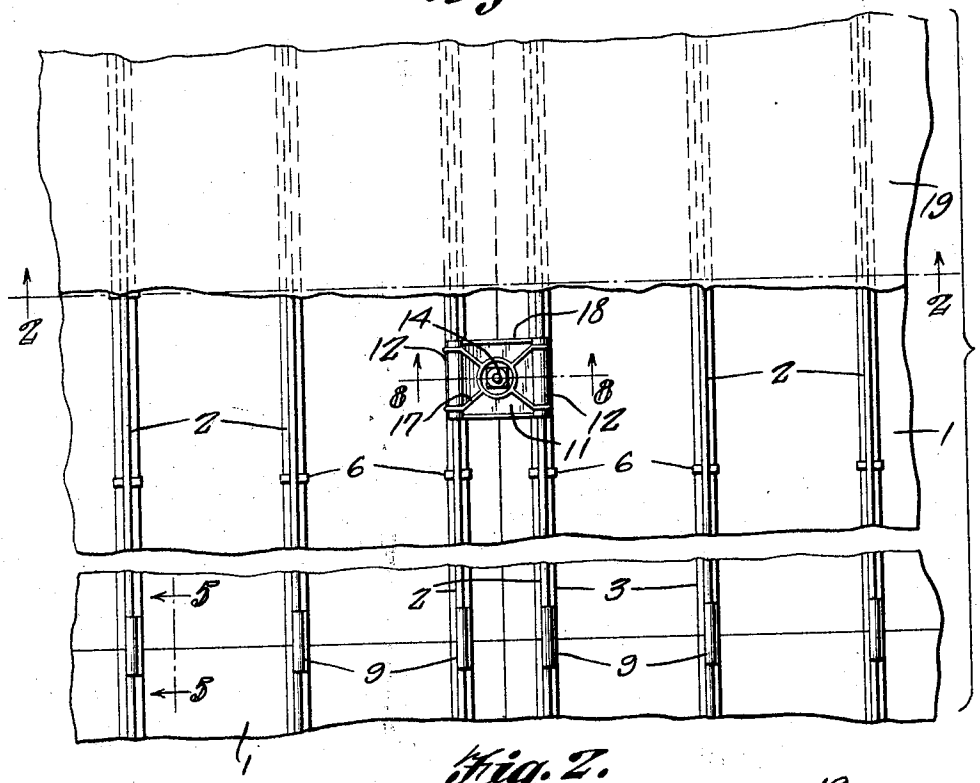


Fig. 2.

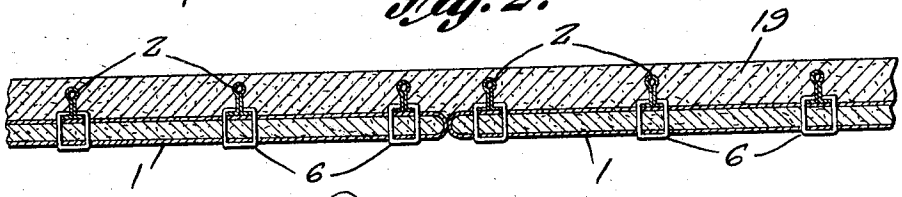


Fig. 3.

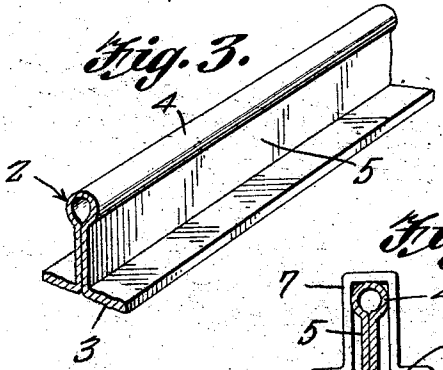


Fig. 4.

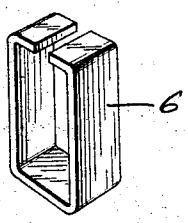
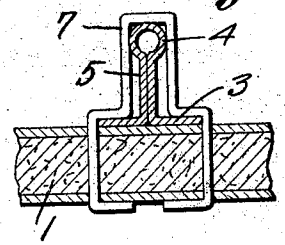


Fig. 11.



P. J. Hickey
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INVENTOR
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ROOF AND FLOOR STRUCTURE

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Fig. 5.

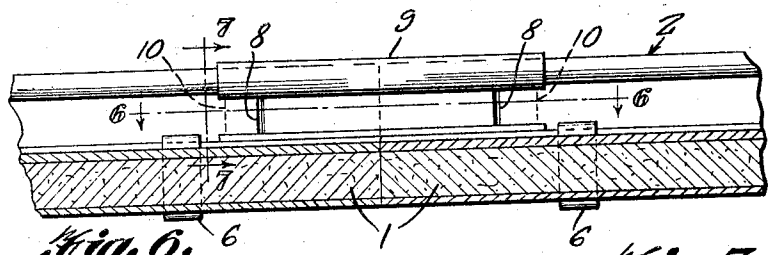


Fig. 6.

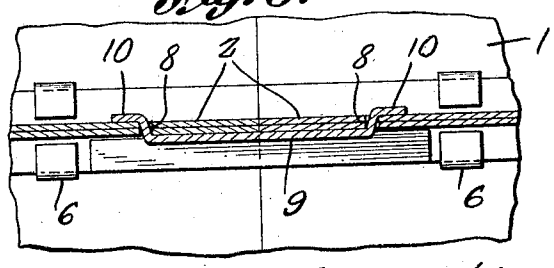


Fig. 7.

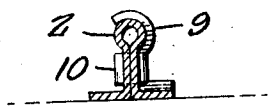


Fig. 8.

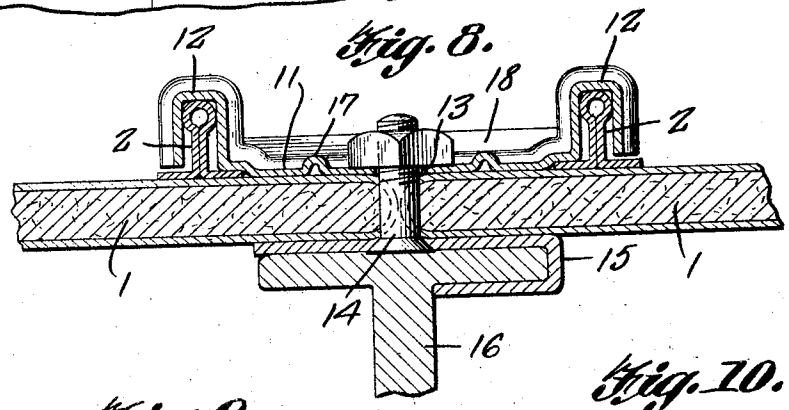


Fig. 9.

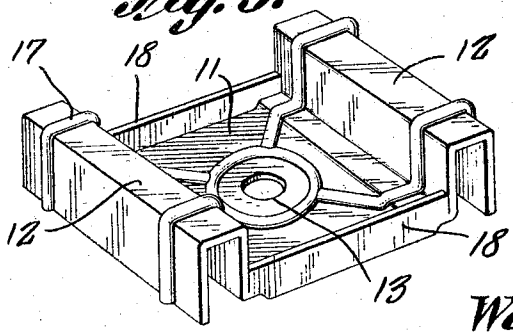
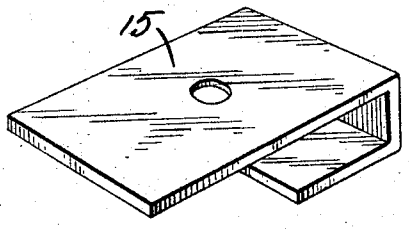


Fig. 10.



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WITNESS:

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ROOF AND FLOOR STRUCTURE

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Fig. 12.

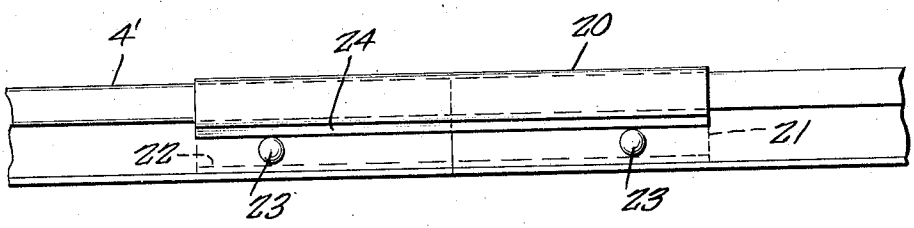


Fig. 13.

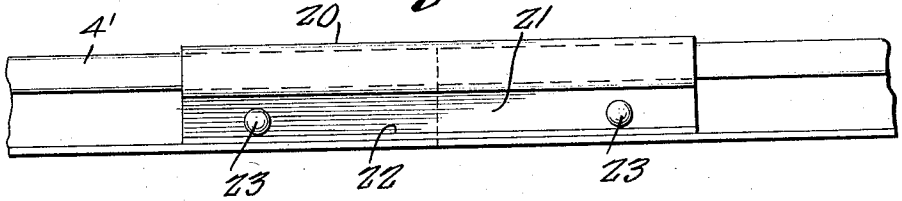


Fig. 14.

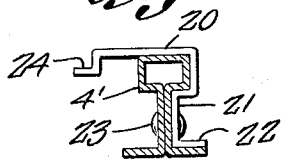


Fig. 15.

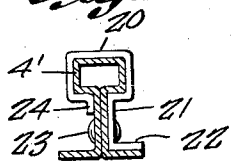


Fig. 16.

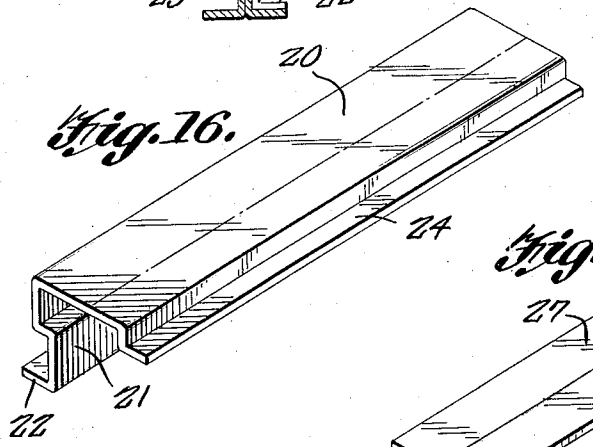
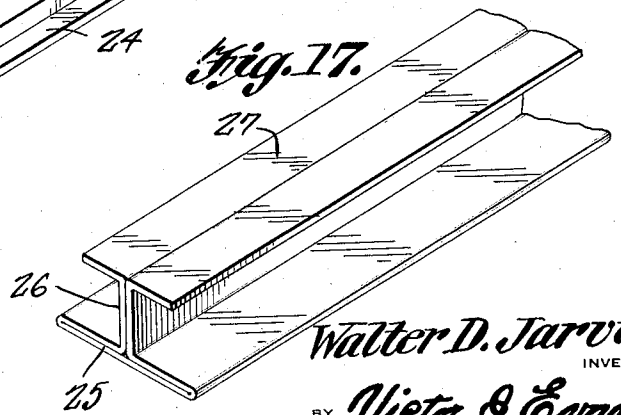


Fig. 17.



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WITNESS:

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ROOF AND FLOOR STRUCTURE

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Fig. 18.

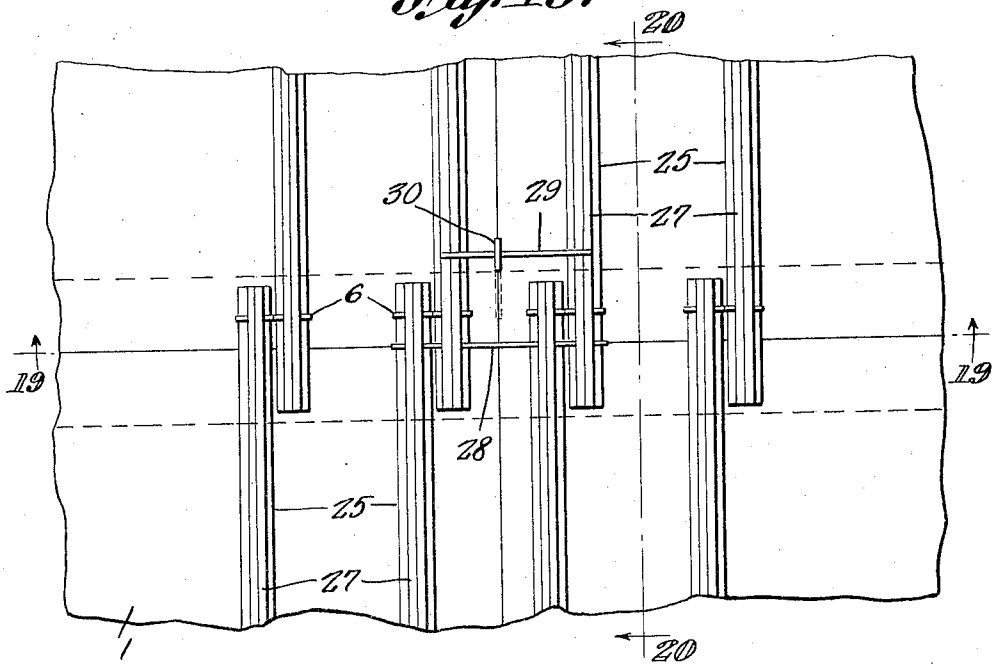


Fig. 19.

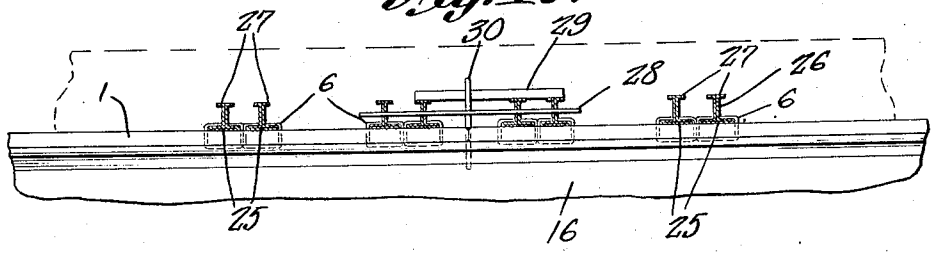
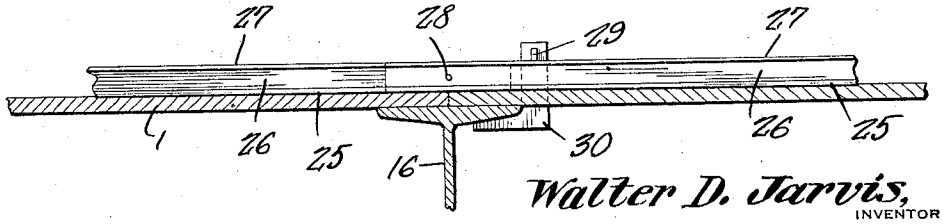


Fig. 20.



Walter D. Jarvis, INVENTOR

BY Victor J. Evans and Co. ATTORNEYS

WITNESS:

Patented Mar. 7, 1933 1,900,346

UNITED STATES PATENT OFFICE

WALTER D. JARVIS, OF PITTSBURGH, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO FRANK W. JARVIS, OF PITTSBURGH, PENNSYLVANIA

ROOF AND FLOOR STRUCTURE

Application filed July 1, 1931. Serial No. 548,204.

The object of the invention is to provide a roof or floor construction of such form that the necessity for false work to permit laying is rendered unnecessary; to provide a construction of the kind indicated in which the floor or roof reinforcing members are initially assembled on boards which eventually become the ceiling facing and the reinforcing members become incorporated in the moldable material after the latter has set; and to provide a construction which will reduce the number of steps, as well as the material required in building, so that a material saving in cost will result thereby.

With this object in view, the invention consists in a construction and combination of parts of which preferred embodiments are illustrated in the accompanying drawings, wherein:—

Figure 1 is a fragmentary plan view of the roof and floor with parts broken away and removed.

Figure 2 is a detailed sectional view thereof cut on the line 2—2 of Figure 1.

Figure 3 is a perspective view of a fragment of one of the rails used in the roof structure.

Figure 4 is a perspective view of one form of means for clinching the sections to the rails.

Figure 5 is an enlarged detailed sectional view cut on the line 5—5 of Figure 1.

Figure 6 is a detailed sectional view cut on the line 6—6 of Figure 5.

Figure 7 is a detailed sectional view cut on the line 7—7 of Figure 5.

Figure 8 is a detailed sectional view enlarged and cut on the line 8—8 of Figure 1.

Figure 9 is a perspective view of a bridging plate used in the roof and floor structure.

Figure 10 is a perspective view of a clip adapted to be used for connecting the roof with the supporting rails.

Figure 11 is a detailed sectional view showing another form of means for clinching the rail to the roof sections.

Figure 12 is a side elevational view of a modified form of the rails which may be used in the structure with a modified plate thereon.

Figure 13 is a side elevation viewing the side opposite to that shown in Figure 12.

Figure 14 is a transverse sectional view of the form shown in Figures 12 and 13 with the plate prior to its final position upon the rails.

Figure 15 is a similar view showing the plate in final position upon the rails.

Figure 16 is a perspective view of the plate as shown in Figures 12, 13 and 14.

Figure 17 is a perspective view of still another form of rail which may be used in the structure.

Figure 18 is a plan view of a modified arrangement of the rails of the structure.

Figure 19 is a sectional view thereof cut on the line 19—19 of Figure 18.

Figure 20 is a section cut on the line 20—20 of Figure 18.

As illustrated in the accompanying drawings the roof consists of sections 1 of fireproof material the adjacent sections having abutting edges whereby the sections lie in a common plane. In the roof structure rails 2 are laid upon the sections 1 in parallel relation and the said rails are preferably formed from sheet metal as indicated in Figure 3 of the drawing the said rails having outstanding base flanges 3 and substantially cylindrical head portions 4 connected with the flanges by web portions 5. As shown in Figures 2 and 4 of the drawings clinching devices which penetrate the sections 1 and have their ends clinched over the upper surfaces of the base flanges 3 of the rails. As shown in Figure 11 of the drawings the clinching devices consist of yokes 7 which pass over the heads of the rails 4 and the side portions of the said yokes penetrate the sections 1 and the free ends of the side are clinched against the under surfaces of the sections 1.

The rails 2 are also in sections and these sections align longitudinally with each other as best shown in Figure 6 of the drawings. The web portions of the adjacent rail sections are provided with openings 8 and plates 9 extend over the heads of the adjacent ends of the rail sections and the said plates 9 are provided with tongues 10 which

pass through the openings 8 and which are disposed against the sides of the webs of the adjacent section. Thus the rail sections are held in proper alignment with each other.

The roof and floor structure includes a bridging plate 11 which is disposed across the abutting edges of the adjacent roof sections as indicated in Figure 1 of the drawings. The plate 11 is provided at its opposite edges with flange portions 12 which are disposed over the rear sections upon the adjacent roof section and the plate 11 is provided at its center with an opening 13 which receives a bolt 14. The bolt is disposed between the adjacent roof sections 1 as most clearly shown in Figure 8 of the drawings. The bolt 14 passes through a clip member 15 which is provided with a return end portion adapted to engage under the upper flange of a roof beam 16. The plate 11 is provided with strengthening ribs 17 which are pressed therein and at its opposite edges the plate 11 is provided with upstanding flanges 18 the said flanges being disposed across the abutting edges of the adjacent roof sections 1. Plastic roof material 19 of gypsum or other fireproof material is filled in between the rails 2 and the upper surface of the material 19 is troweled down to the level of several inches above the upper edges of the rail sections. A roof so constructed is of strong and durable nature and is fireproof.

In the form of rail as shown in Figures 12 to 15 inclusive the same is made with a head portion 4′ which is rectangular in cross section. Otherwise this form is the same as that shown in Figures 1, 2 and 3.

The plate 20 is provided with a web portion 21 which fits against one side of the web portions of the rails, and the portion 21 is extended into a flange 22 which rests upon the base flanges of the rails 4′. Rivets 23 pass transversely through the portion 21 and the webs of the rails 4′. The intermediate portion of the plate is bent down over the heads of the rails 4′, by the use of a special tool (not shown) so that it assumes the position and shape as shown in Figure 15 and a flange 24 of the plate bears against the sides of the webs of the rails 4′. The edge of the flange 24 lies above the rivets 23. By such arrangement the plate may be applied to the rails, on the job and the structure will have additional strength as the plate fits snugly upon the rails just above the rivets. The rivets may be spot welded, soldered or otherwise suitably secured in position.

The form of rail shown in Figure 17 consists of a strip of sheet metal folded upon itself to form a broad base flange 25. The web portions 26 extend up from the medial length of the base flange and the head flanges 27 are disposed parallel with the base flange. Said rail section may be formed by a rolling operation and the rail possesses great strength.

In the arrangement as shown in Figures 18, 19 and 20 the structure includes the rails having overlapping end portions, the said rails having their base flanges 25 located above the sections 1 and a pin 28 passes through the web portions of adjacent rails in the vicinty of the ends thereof. Clips 6 are carried by the base flanges of the rail and pass through the sections 1. A bar 29 rests upon the heads 27 of adjacent rails and a clip 30 is mounted upon the bar 29 and passes between the sections 1 and the lower end of the clip 30 engages under the top flange of the beam 16, as best shown in Figure 20 of the drawings. This is a very strong structure and provides a positive anchorage of all corners of the forms. The load carrying members are also the reinforcing members.

In carrying out the invention, the rails, of whatever form they be, are made of a length sufficient to span adjacent beams set to support the ceiling or floor structure. These rails are assembled by being attached to the fireproof sections in parallel relation, preferably closely spaced. They thus serve to reinforce the sections and when the latter are laid on the supporting beams, the seams between adjacent sections running longitudinally of the beams are disposed over the top faces of the latter and the rails are arranged transversely of the beams. Thus the reinforced sections replace the false work customarily employed for receiving the molded floor or roof. The moldable material is then deposited on top of the sections and troweled or otherwise worked to a level above the level of the upper edges of the rails, so that when set, the rails become incorporated with the molded material to serve as a metallic reinforcement for the same, while the sections to which the rails were initially attached constitute the ceiling facing of the completed structure and may be faced with a white coating of plaster or with any other finishing means desired.

Having described the invention what is claimed is:—

1. In a structure as described sections of fireproof material having abutting edges, rails laid upon said sections in parallel relation, means for clinching the rails to the sections, a bridging plate disposed over the seam between the sections and provided at opposite edges with flanges disposed over the adjacent rails, said bridging plate having at its intervening edges upstanding flanges, and a plastic filler of fireproof material laid upon the sections between the rails and having an upper surface troweled to a level above the upper edges of the rails.

2. In a structure as described sections of fireproof material having abutting edges, rails laid upon said sections in parallel relation, means for clinching the rails to sections, a bridging plate disposed over the seam between the sections and provided at its opposite edges with flanges which engage over the upper edges of adjacent rails, a bolt passing through the center of said plate and a clip member mounted upon said bolt and lying under the sections and adapted to engage the flange of a supporting beam.

3. In a structure as described sections of fireproof material having abutting edges, rails laid upon said sections in parallel relation, means for clinching the rails to the sections, a bridging plate disposed across the seam between the sections and provided at its opposite edges with flange portions engaging over the upper edges of the rails, said bridging plate provided at its intervening edges with upstanding flanges disposed transversely of the seam, said plate having strengthening ribs and provided at its center with an opening, a bolt passing through said opening and disposed transversely between the sections, and a clip member mounted upon the lower end of the bolt and lying under the sections and provided with an end portion adapted to engage under the flange of a supporting beam.

4. A structure as described comprising rails having overlapping end portions, a cross pin passing through the overlapping ends of the rails, sections attached to the base flanges of the rails, a bar mounted upon the top flanges of the rails and a clip mounted on said bar and passing between the sections and attached to engage under the supporting beam of the structure.

5. A roof and floor structure comprising supporting beams, boards laid across said supporting beams in edge abutting relation, rails to which said boards are secured, said rails being arranged transversely to said supporting beams and being of lengths sufficient to span at least adjacent supporting beams, the boards being secured to the under faces of said rails, and a moldable filler disposed on top of said boards and troweled to a level to completely enclose all but the board engaging faces of the rails and dispose the neutral axis of the formed structure near the upper edges of the rails, whereby the boards and rails initially take the place of false work for holding the filler during working and the rails serve as permanent reinforcements for the filler after setting.

6. A roof and floor structure comprising supporting beams, boards laid across said supporting beams in edge abutting relation, rails to which said boards are secured, said rails being arranged transversely to said supporting beams and disposed on closely related parallel lines, the boards being secured to the under faces of said rails and the latter being of sufficient length to span at least adjacent supporting beams, and a moldable filler disposed on top of said boards and troweled to a level to completely enclose all but the board engaging faces of the rails and dispose the neutral axis of the completed structure near the upper edges of the rails, whereby the boards and rails initially take the place of false work for holding the filler during working and the rails serve as permanent reinforcements for the filler after setting.

7. A roof and floor structure comprising supporting beams, boards laid across said supporting beams in edge abutting relation, rails to which said boards are secured, said rails being arranged transversely to said supporting beams and being of lengths sufficient to span at least adjacent supporting beams, means laterally coupling adjacent rails at the contacting edges of certain boards, and a moldable filler disposed on top of said boards and troweled to a level to completely enclose all but the board engaging faces of the rails and dispose the neutral axis of the completed structure adjacent the upper edges of the rails, whereby the boards and rails initially take the place of false work for holding the filler during working and the rails serve as permanent reinforcements for the filler after setting.

8. A roof and floor structure comprising supporting beams, boards laid across said supporting beams in edge abutting relation, rails to which said boards are secured, said rails being arranged transversely to said supporting beams and being of lengths sufficient to span at least adjacent supporting beams, means coupling the ends of the rails at certain contacting edges of adjacent boards, means laterally coupling adjacent rails at the remaining contacting edges of adjacent boards, and a moldable filler disposed on top of said boards and troweled to a level to completely enclose all but the board engaging faces of the rails and dispose the neutral axis of the completed structure near the upper edges of the rails, whereby the boards and rails initially take the place of false work for holding the filler during working and the rails serve as permanent reinforcements for the filler after setting.

9. A roof and floor structure comprising supporting beams, boards laid across said supporting beams in edge abutting relation, rails to which said boards are secured, said rails being arranged transversely to said supporting beams and being of lengths sufficient to span at least adjacent supporting beams, means coupling the ends of the rails at certain contacting edges of adjacent

boards, means laterally coupling adjacent rails at the remaining contacting edges of adjacent boards, said lateral means having a supporting beam engaging anchor, and a moldable filler disposed on top of said boards and trowled to a level to completely enclose all but the board engaging faces of the rails and dispose the neutral axis of the completed structure adjacent the upper edges of the rails, whereby the boards and rails initially take the place of false work for holding the filler during working and the rails serve as permanent reinforcements for the filler after setting.

In testimony whereof I affix my signature.

WALTER D. JARVIS.