March 14, 1967 R. H. ASHWORTH 3,308,594

SLOTTED PANEL ASSEMBLY

Filed June 10, 1963

FIG. 1.

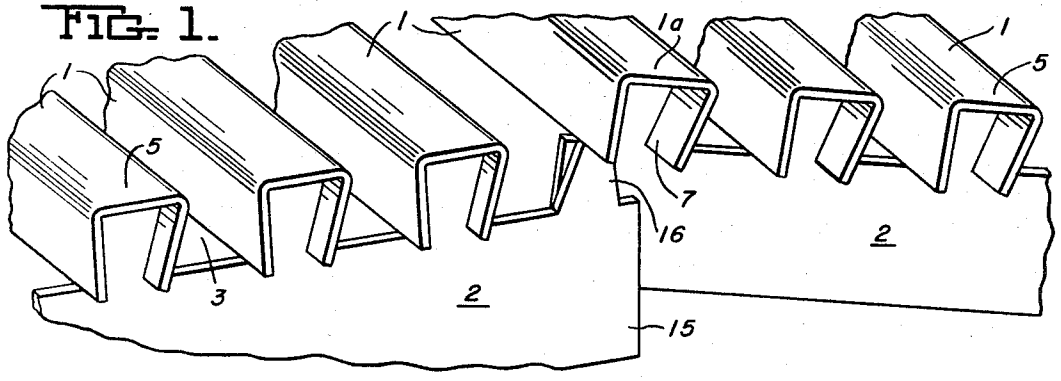


FIG. 2.

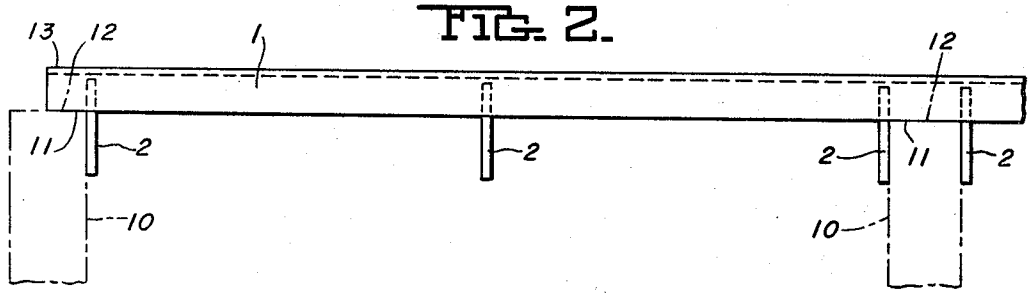


FIG. 3.

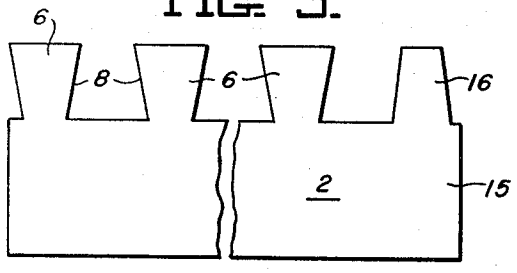
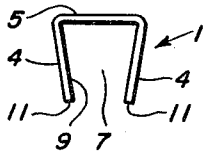


FIG. 4.



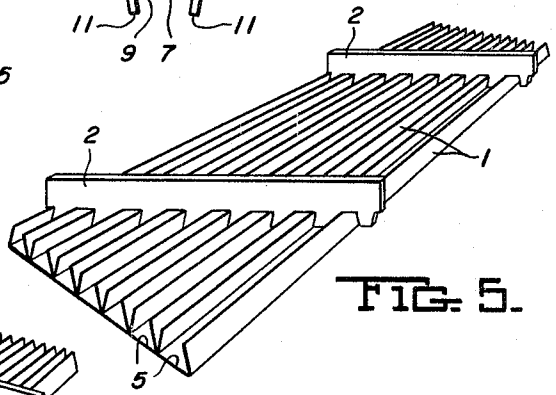
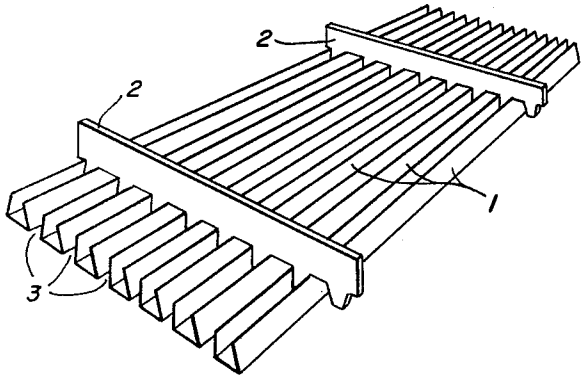


FIG. 5.

FIG. 6.



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SLOTTED PANEL ASSEMBLY

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2 Claims. (Cl. 52—507)

This invention relates to a slotted metal panel and to a method of assembling it.

One of the principal objects of the invention is to provide a panel that may be constructed inexpensively from a small number of parts formed from sheet steel. A further object of the invention is to provide a panel which may be manually assembled at the site where it is to be used without special tools, fastening devices or welding operations.

For the above and related purposes, the slotted panel of this invention is constructed conveniently and simply from two structural elements, namely, sheet metal channels and stiffner tie-plates for holding the channels in spaced parallel relation. The tie-plates, more specifically, are stamped from sheet steel with dovetails spaced along one edge thereof. The channels are also formed from sheet steel by rolling or bending and have converging flanges for engagement over the tie-plate dovetails in a manner to be described to form a connection for holding the channels against movement relative to the tie-plates.

Other objects and advantages of the invention will become apparent from the drawings and following description of a preferred embodiment of the invention. In the drawings:

FIGURE 1 is a fragmentary perspective view which shows the construction of the slotted panel of this invention and the manner in which two adjacent panels are joined together;

FIGURE 2 is a side elevational view that shows the manner in which the panels are supported on the joists of a building to form a floor structure therefor:

FIGURE 3 is a side elevational view showing the construction of one of the stiffener tie-plates used in the construction of the panel of this invention;

FIGURE 4 is an end view of one of the channels used in the construction of the panel shown in FIGURE 1; and

FIGURES 5 and 6 are diagrammatic perspective views illustrating steps in the assembly of the panel of this invention.

As shown in the drawings, the panel of this invention is constructed from channels **1** and transverse stiffeners or tie-plates **2** that are fabricated from sheet steel, the channels **1** being assembled in laterally spaced parallel positions with slots **3** therebetween and the tie-plates **2** operating to secure the channels **1** against movement out of these positions. The channels **1** are fabricated from a strip of sheet steel by a cold forming operation, either by rolling or on a brake machine, to the required shape in which their flanges **4** converge outwardly with respect to their webs **5**. The tie-plates **2** are formed by stamping a strip of sheet metal to provide dovetails **6** at spaced intervals along one edge thereof. The dovetails **6** and the spaces **7** between the flanges **4** of each channel **1** have substantially the same size and shape. More specifically, the dovetails **6** have lateral edges **8** that diverge toward their outer ends and have a slope that is opposite that of the converging channel flanges **4** so that they will engage with a snug fit the inner surfaces **9** of the channel flanges **4** when the channels **1** and tie-plates **2** are assembled to form a panel.

FIGURES 5 and 6 illustrate the manner in which the channels **1** and tie-plates **2** are assembled to form the panel of this invention. This is accomplished by first placing the channels **1** in inverted side-by-side positions with their webs **5** in a common plane on a supporting surface as

shown in FIGURE 5. Each tie-plate is then placed in a transverse position over the channels **1** in which it extends at an angle of approximately 45° with respect to their longitudinal centerlines and from which it is lowered to insert the dovetails **6** thereon in the spaces **7** between the channel flanges **4**. After this has been done the tie-plates **2** are rotated by a twisting movement to the positions shown in FIGURE 6 in which they extend transversely and normal to the channels **1**. This twisting movement of the tie-plates **2** moves the edges **8** of the dovetails **6** into snug holding engagement with the inner surfaces **9** of the channel flanges **4** and further spreads the channels **1** apart relative to each other to form the slots **3** between their webs **5**, which are thus arranged and held in a common plane. In effect the dovetails **6** form anchoring lugs that rotate into anchoring engagement with the channel flanges **4** when the tie-plates **2** are rotated to their channel holding positions shown in FIGURE 6. These operations complete the assembly of the panel of this invention which may then be used in the structure or building for which it is intended.

FIGURE 2 shows the manner in which the panels of this invention are supported on the joists **10** of a building to form a floor therein. From this showing it will be apparent that the lower edges **11** of the channel flanges **4** have supporting engagement on the upper surfaces **12** of the joists **10**. Each end of the panels, such as the end **13**, is either supported on a joist at one side of the building or on one of its intermediate joists. The panels are preferably constructed in lengths of 18 to 20 feet, so that they will span several joists in a building. The dovetails **6** have a vertical dimension which is shorter than that of the channel spaces **7** so that they do not engage the channel webs **5** and, as a consequence, the tie-plates **2** do not carry any part of the weight of the channels **1** or the load supported thereon. However, the tie-plates **2** act as stiffeners for the channels **1** in that they prevent buckling of the channel flanges **4** under heavy loads and thus increase the carrying capacity of the panels. In this respect, the location of tie-plates **2** adjacent the joists **10** and thus at the points where the floor load is transferred to the building, as well as at intermediate points between the joists **10** as shown in FIGURE 2, is desirable from the standpoint of stiffening the channel flanges **4** against buckling. The tie-plates adjacent the joists **10** may be nailed or otherwise secured thereto.

In order to facilitate their handling manually and so that their weight will be such that they can be handled by two men, the panels are preferably assembled in widths of 18 to 24 inches which of course requires panels placed side by side in structures of greater width such as floors. To hold such panels against lateral movement relative to each other, one end **15** of each tie-plate **2** preferably extends beyond the edge of the panel and is formed with an upwardly projecting lug **16** for hooking engagement in the space **7** between the flanges **4** of the end channel **1***a* of an adjacent panel as shown in FIGURE 1 of the drawings.

Slotted panels assembled from channels **1** and tie-plates **2** as described above are especially suited because of their self-cleaning action for use as flooring in hog or other cattle-raising pens, but have general utility as flooring in other buildings and for other purposes. They may be used, for example, as wall panels, sewer-drop gratings, catwalks, landing mats and the like.

While one embodiment of my invention has been shown and described it will be apparent that other adaptations and modifications may be made without departing from the scope of the following claims.

I claim:

1. A slotted floor panel comprising a plurality of channels having converging side flanges along the webs thereof,

said channels being arranged in laterally spaced parallel positions with said webs lying in a common horizontal plane and with said flanges extending downwardly therefrom, said channel webs forming a floor surface and respectively having downwardly opening slots along opposite edges thereof, and at least two tie-plates respectively having dovetails at spaced intervals along one edge thereof, said tie-plates occupying positions spaced longitudinally of said panel and extending transversely of said channels with said dovetails fitted in the spaces between the said converging side flanges and holding said channels against movement out of said parallel positions, each of said dovetails having side edges that diverge upwardly from said tie-plate and having holding engagement with the internal surfaces of the channel flanges defining the said spaces in which said dovetails are received, said panel being supported solely by contact with at least a pair of spaced supporting surfaces directly engaging the free edges of said flanges.

2. A slotted floor comprising the combination with a plurality of parallel joists, of a plurality of slotted floor panels extending transversely of and supported on said joists in side-by-side relation, each of said panels comprising a plurality of laterally spaced and parallel channels respectively having downwardly extending and converging side flanges along the webs thereof, said webs lying in a common horizontal plane forming a floor surface and respectively having downwardly opening slots on opposite edges thereof and extending along the length thereof, said flanges extending downwardly from said webs and having supporting engagement at their lower edges on said joists, and at least two tie-plates respectively having dovetails at spaced intervals along one edge thereof, said tie-plates occupying positions spaced longitudinally of said panel and extending transversely of said channels with said dovetails fitted in the spaces between the said converging side flanges and holding said channels against movement out of said parallel positions, each of said dovetails having side edges that diverge upwardly from said tie-plate and having holding engagement with the internal surfaces of the channel flanges defining the said spaces in which said dovetails are received.

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