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W. L. EDGAR
CELLULAR STEEL FLOOR

2,910,152

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2 Sheets-Sheet 1

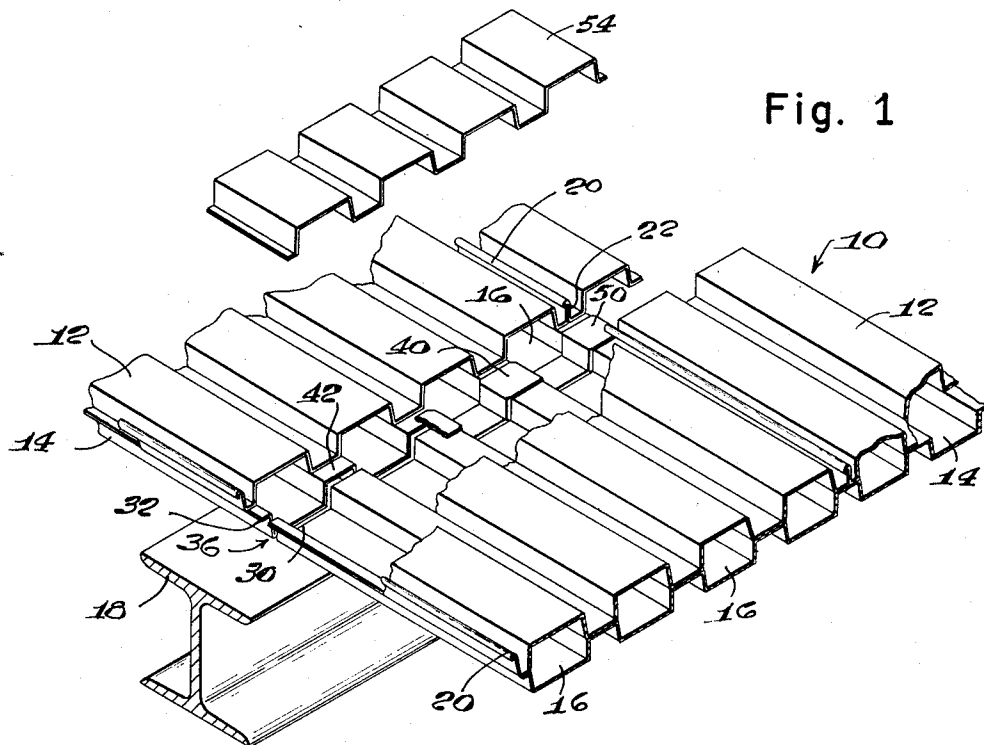
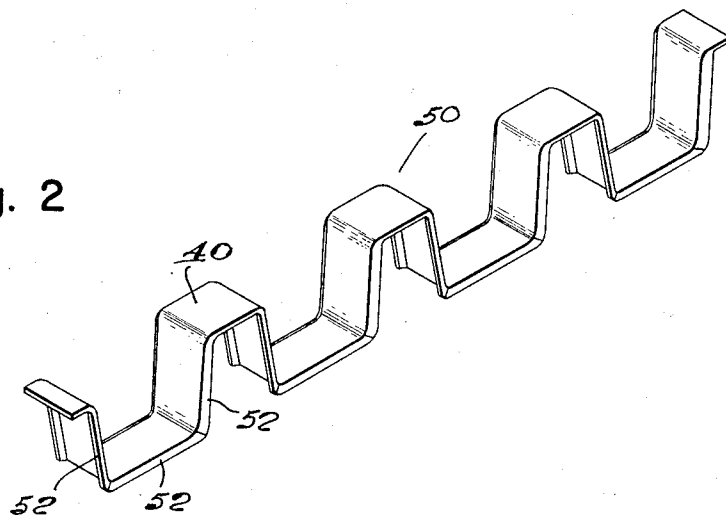


Fig. 1

Fig. 2



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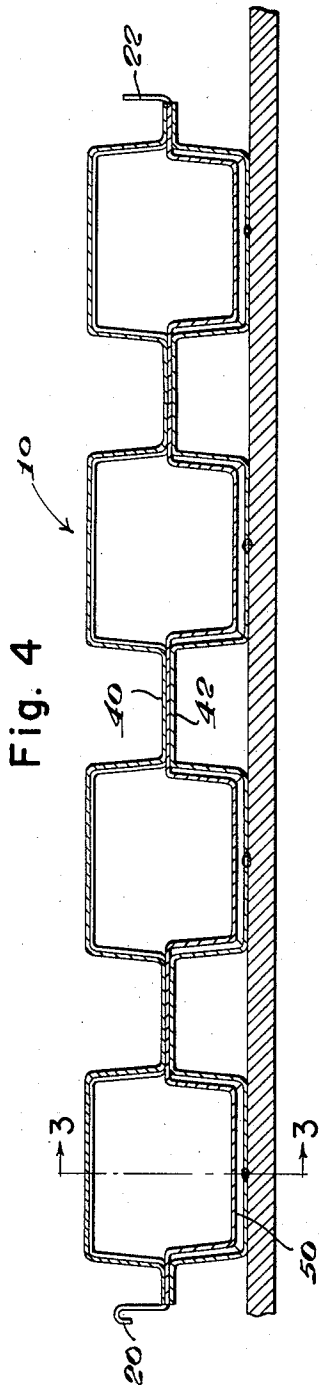
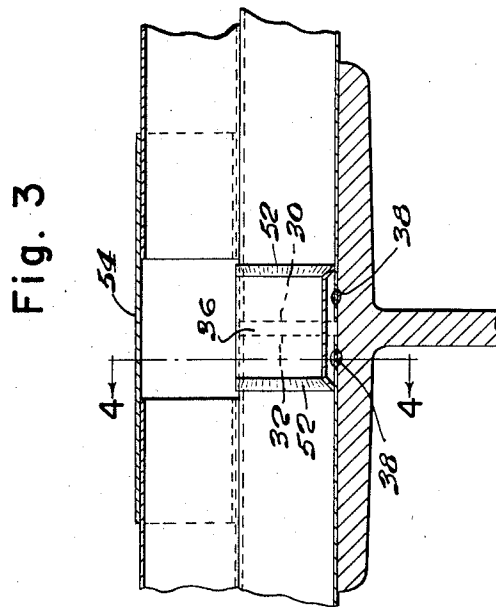
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1 Claim. (Cl. 189—34)

This invention relates to a building construction and more particularly to a cellular steel floor.

The invention has for an object to provide a novel and improved cellular steel floor embodying multicellular floor units having a plurality of spaced and longitudinally extended cells forming potential wire distributing cells and in which provision is made for connecting the units end to end in a novel, simple, economical and efficient manner.

A further and more specific object of the invention is to provide a novel and improved cellular steel floor of the character specified embodying novel end joints adapted to permit longitudinal adjustment of the units relative to each other and whereby to accommodate irregularities in the lengths of the units and to compensate for irregularities in the adjacent ends of the floor units being joined and for minor variations in field conditions during the erection of the flooring.

With these general objects in view and such others as may hereinafter appear, the invention consists in the floor construction hereinafter described and particularly defined in the claim at the end of this specification.

In the drawings illustrating the preferred embodiment of the invention:

Fig. 1 is a perspective view illustrating the present end joint with portions of the leading and trailing ends respectively of the two floor units being cut away;

Fig. 2 is a perspective view of the present end joint bushing;

Fig. 3 is a sectional view taken on the line 3—3 of Fig. 4; and

Fig. 4 is a sectional view taken on the line 4—4 of Fig. 3.

The invention contemplates a cellular steel floor embodying improved end joints between adjacent floor units. The cellular steel floor may and preferably will be of the type illustrated in the United States Patents Nos. 1,855,082 and 1,867,433. During the erection of such floors the units are laid end to end, preferably being supported upon steel structural members, such as girders, so that the joints between the ends of adjacent units come over the girders and so that the cells of one unit cooperate with and form extensions of the cells of a second unit to provide a plurality of continuous ducts or conduits extending across the building and through which wiring for electrical service of various sorts may be drawn.

In the erection of such prior cellular metal floors it has been the practice to lay successive flooring units end to end in substantially abutting relation. Such practice required that the component sheets be subjected to a resquaring operation in the manufacture thereof after the rolling operation forming the corrugations therein. The resquaring operation was effected by a transverse shear at each end of the corrugated sheet in order that the ends be perfectly square to provide a substantially tight seam between the abutting ends of the flooring units when erected. Such resquaring prac-

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tice resulted in a substantial waste of material in the form of scrap and also required the services of several workers in handling the sheets and in controlling the shearing operation.

In accordance with the present invention provision is made for joining the ends of the cellular metal units in nesting and overlapping relation in a manner such that no portions of the ends of the units are required to be in abutting engagement and whereby the units may be adjusted longitudinally relative to each other during the erection thereof to accommodate slight variations in the length of the units and to compensate for minor variations in field conditions. Thus, in practice the aforesaid resquaring operation may be eliminated resulting in substantial savings in material and labor in the production of the units and also eliminating the need for maintaining exact tolerances in the lengths of the units. The novel structure of the end joints of the present cellular metal floor is also such as to maintain substantially the full cross sectional area of metal at the joints so as to maintain the load bearing properties unimpaired at the ends of the units and also serves to stiffen the joints against accidental damage in transit or by handling during the erection of the floor. The present structure also insures positive alignment of the individual cells of the units and provides substantially smooth internal surfaces at the joints to facilitate their use as raceways for wire pulling.

Referring now to the drawings, 10 represents one type of cellular metal floor unit which comprises a multicellular unit formed by assembling and uniting together, preferably by welding, an upper corrugated sheet 12 and a lower corrugated sheet 14 to provide a unit having in effect a series of closely spaced parallel hollow beams or cells 16. In erecting the floor the individual building units extend between the structural steel supporting elements of the building with the ends of the units resting on and preferably welded to the same, and as herein shown, these structural elements comprise girders 18, a plurality of units being laid end to end forming continuous elongated cells particularly useful as potential wiring cells. Adjacent units may be laid side by side and connected in interlocking relation by the cooperation of marginal lip portions 20, 22 formed on opposite sides of the lower corrugated sheet 14, as shown in Fig. 1.

In accordance with the present invention the leading end 30 and the trailing end 32 of each floor unit are constructed so that the lower corrugated sheet 14 projects substantially beyond the upper corrugated sheet 12. In erecting the individual floor units the trailing end 32 of one unit is spaced slightly from the leading end of the next endwise adjacent unit to provide a clearance 36 between the ends of the lower corrugated sheets. In Fig. 3 the endwise adjacent sheets are illustrated in such position, and the bottom walls of the corrugations of the lower sheets 14 are welded as at 38 to the supporting structural member, herein shown as the girder 18. This clearance 36 between the ends of endwise adjacent units enables slight adjustments to be made in order to secure alignment of the cells and to compensate for irregularities in the lengths of the units, and at the same time compensates for any irregularities in the transverse edges of the units so that the resquaring operations above referred to may be eliminated. It will be observed that the lower corrugated sheets 14 of each unit are maintained at their full cross sectional area throughout their length, thus contributing to the load bearing abilities of the unit.

In order to facilitate the drawing of electrical wiring through the cells and across the joints, a bushing 50 illustrated in Fig. 2, preferably of thin gauge steel or other suitable material, is of a size and shape such as to

snugly fit within the adjacent projecting portions of the lower corrugated sheets of endwise adjacent units in the manner illustrated in Figs. 1, 3 and 4. The marginal portions 52 of the walls forming each corrugation of the bushing are shaped to provide beveled surfaces which engage the interior surface of the corrugations to form a smooth surface straddling the clearance 36 to thereby facilitate drawing of the electrical wiring across the joint without injury to the insulating coatings thereof. The flanges 40 which connect the corrugations of the bushing are free of such beveled surfaces and rest upon the flanges or webs 42 connecting adjacent corrugations of the lower corrugated sheet of each of the units, as clearly shown in Figs. 1 and 4. The upper corrugated sheets are provided with a corrugated cover member 54 which is shaped to snugly fit over the corrugations of the upper sheets 12 of the two endwise adjacent units, and when in operative position engages the flanges 40 to hold the same on top of the webs 42 as shown in Fig. 4.

From the description thus far it will be observed that the present construction of end joint is simple, strong and enables the relative alignment of the flooring units being joined and also eliminates the resquaring operations which have heretofore been necessary in order to compensate for irregularities in the edges of the ends of the flooring unit.

Having thus described the invention, what is claimed is:

In a building construction, a flooring structure comprising a plurality of multicellular sheet metal flooring units erected side by side and in end-to-end relation upon a supporting framework to form the flooring, each of the flooring units comprising upper and lower corrugated sheets secured together to form a plurality of spaced and longitudinally extended cells comprising potential wiring ducts, the transverse marginal edges defining the ends of the sheets being irregular in contour, the ends of the upper sheets being set back from the ends of the lower corrugated sheets, and the ends of adjacent units being

supported on the building framework in longitudinally aligned and non-abutting spaced endwise relation providing a variable clearance space between adjacent ends of the lower corrugated sheets to compensate for variable tolerances in the length of the units and in irregularities in the contour of the transverse edges of the ends of the lower corrugated sheets, adjacent ends of the lower walls of the latter being welded to the framework, and a thin corrugated bushing disposed within and conforming to the shape of adjacent ends of the lower corrugated sheets and bridging the clearance space between the ends of said adjacent units and covering said welds, said bushing being of a width approximately equal to the spacing between the set-back ends of the upper corrugated sheets and having beveled portions along the bottom and side walls of the corrugations, the upper walls of the corrugations of said corrugated bushing being flat and overlapping the upper walls of the corrugations of adjacent lower corrugated sheets, and a corrugated cover member bridging the space between the ends of said upper corrugated sheets, the lower walls of said corrugated cover member engaging the upper flat walls of the corrugations of said corrugated bushing in the assembled structure, said beveled portions of the bushing effecting deflection of the wiring drawn through the cells from engagement with said spaced irregular ends thereof.

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