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C. TIETIG ET AL

2,308,943

BRIDGE AND FLOORING THEREFOR

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Fig. 1.

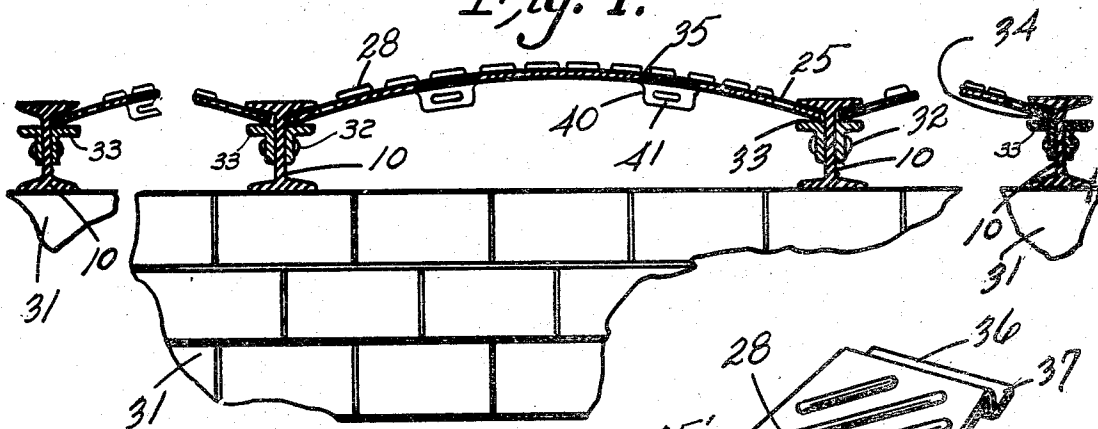
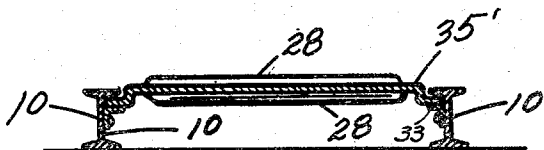


Fig. 3.

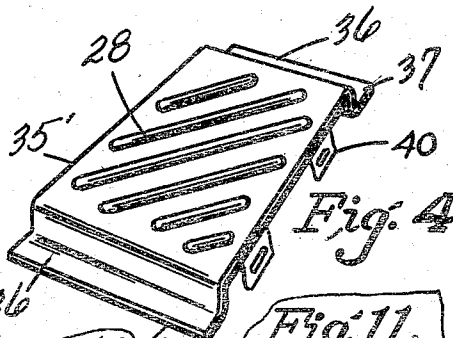


Fig. 4.

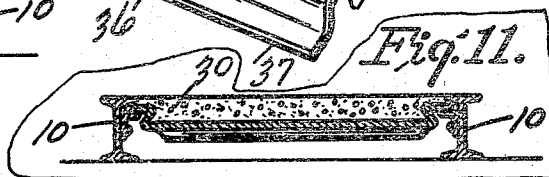


Fig. 11.

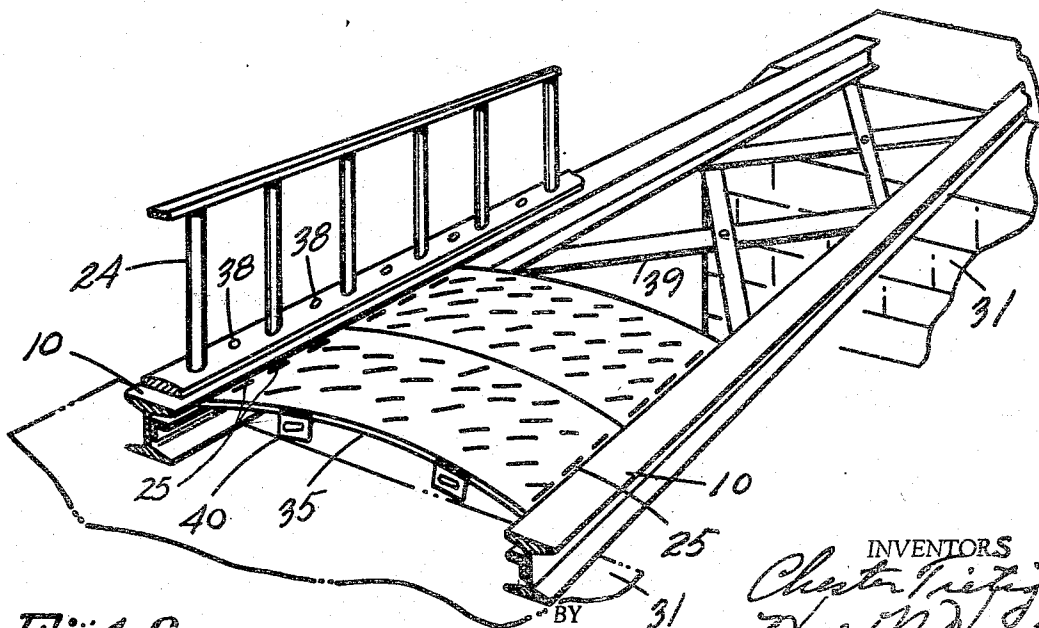


Fig. 2.

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BRIDGE AND FLOORING THEREFOR

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2 Claims. (Cl. 14—73)

This invention relates to a sectional bridge and sectional flooring for bridge and general use. The bridge is of the kind which spans comparatively short distances, that is to say, less than 500 feet, preferably less than 300 feet, although the invention is not limited to any dimensions. The flooring is especially adapted for use upon bridges, but may be used for general purposes.

Among the objects of the invention is the provision of a bridge or floor which is made up of a small number of standard parts, so that a bridge of substantially any length within the dimensions above given, or any reasonable breadth may be assembled even by unskilled labor, by attaching such parts to each other and to standard supporting beams. The flooring is of the same general nature and can be used to advantage to make highways, ship decks, factory floors, etc.

Figure 1 is a sectional view of a bridge or flooring adapted to use rolled steel plates and beams.

Figure 2 is a perspective view of a partially constructed bridge of the same character as that of Figure 1.

Figure 3 is a sectional view of a width extending plate showing our special mounting therefor.

Figure 4 is a perspective view of the same kind of plate as is shown in Figure 3, except that it is dismounted.

In the drawing, 10 is one of a plurality of I-beams upon which the roadway or flooring structure of the bridge rests. Generally only two I-beams are necessary for a small bridge as shown in Figure 2, although any number of I-beams may be employed to broaden the structure as indicated by Figure 1. Beams built up of channel sections or angle irons to resemble I-beams are deemed to be the equivalents of I-beams.

Referring to Figure 2, it will be seen that the bridge is composed of an infinite number of floor sections 35, longitudinally considered. Each plate closely abuts its neighbor and has an upwardly extending arcuate form. The arc is rather flat.

Each plate is clamped under the top web of each of the I-beams 10 by means of a special construction which is of the essence of the invention. In Figures 1 and 2, 31 are the bridge abutments, but 31 in Figure 1 may also be a wall, as of a factory, or it may also indicate the side plates of a ship. The form shown in Figure 1 is particularly adapted to cover extensive spaces. For this reason, the outer plates are shown discontinuous to indicate that any number of them may be joined by means of I-beams to make flooring.

Adjacent the vertical web of I-beams 10, they are attached by means of rivets or bolts 32, but preferably by means of bolts, one or more angle irons 33. These irons are attached in approximately the position shown, so that an acute angled crevice 34 is formed under the laterally extending web of the beam. This crevice 34 should be large enough to admit the edge of the plate 35 so that the edge of said plate abuts the vertical web of the beam 10. The crevice should be wide enough to make allowance for the curvature of the plate 35 as shown in Figure 1. In other words, it should be wider than the thickness of the plate 35 when the latter occupies only a single plane. The result is that strong flooring is made from the plate 35, since a downwardly pressing load puts the plate into compression against the vertical webs of the I-beams and thereby takes advantage of the great inherent strength of the arch-like form. It is to be noted that the tops of I-beams 10 are left free of rivets and perforations, consequently no roughness is created and strength is not impaired. The tops of the beams 10 are left smooth to form a part of the flooring or roadway as well as the plates.

While the load of the roadway is carried on the top flanges of the angle irons 33, there is a certain clamping action between the angle irons and the top lateral web of the I-beams so that vibration and loosening of the plates is kept to a minimum.

In Figs. 3 and 4, a modified form of plate 35' is shown. In this form, in which there is no conventional arch, but instead a flat arch, there is a shoulder 36 on each side of a flat surface. A flange 37 is therefore created which is adapted to fit into the crevice 34 as shown in Figure 3. The flattened form of plate 35' is preferably corrugated by grooves 28, some of which project upwardly and some downwardly, thus adding to the total strength of the plate to resist buckling.

As shown in Figure 2, a railing 24 may be attached by bolts 38 to the tops of I-beams 10. Steel reinforcing struts 39 may also be applied as shown in Figure 2 or in any conventional way, to keep the beams 10 from spreading away from each other under load. It is to be noted that the plates 35 as used in our construction are wider than they are long, it being intended that each plate shall be of the approximate width of the road and that the arch thereof shall approximate the ordinary crown of a roadway. The curved plates are also preferably scored with grooves 28 and if desired, they may

be held together to prevent spreading in the direction of the length of the roadway by means of tabs or lugs 40, a few of which are shown in Figures 1 and 2. The plates 35 are to be bolted together by causing said tabs or lugs to abut and the tabs are then to be secured together by means of bolts (not shown) which extend through slots 41.

It is recommended that when the structure is assembled, the angle irons 33 be first hung loosely by bolts from the vertical webs of the I-beams 10 and that the ends of the plates 35 be then inserted into the crevices 34, following which the bolts are tightened to clamp the plate edges between the horizontal angle iron flange and the horizontal web of the I-beam.

A row of weep holes 25 are preferably provided through the plates 35 immediately adjacent the edge of the horizontal webs of the I-beams when the structure is assembled.

We claim as our invention:

1. A metal flooring structure comprising a pair of longitudinally-extending beams arranged in substantially parallel spaced relation, said beams each having a vertical web and a pair of horizontally disposed flanges extending laterally from the web closely adjacent its top, said pair of flanges being arranged in substantially parallel closely-spaced relation so as to define a relatively narrow crevice extending longitudinally and adjacent the top of said beam and the pairs

of flanges being located on opposed faces of said beams, and a plurality of upwardly arched plates arranged in laterally-abutting relation with their ends projecting into the crevices of the opposed beams and engaging respectively the upper and lower surfaces of the flanges, said flanges providing substantially the sole support for said plates.

2. A metal flooring structure comprising a pair of longitudinally-extending beams arranged in substantially parallel spaced relation, said beams each having a vertical web and a horizontally disposed flange extending from the top of said web, the flanges of said beams being disposed toward each other, angle irons secured to said beams, each of said angle irons having a vertical flange flatly abutting the vertical web of a beam and rigidly fastened thereto and a horizontal flange located a spaced distance below the horizontal flange of the beam so as to form therewith a relatively narrow crevice extending longitudinally and adjacent the top of said beam, and a plurality of upwardly arched plates arranged in laterally-abutting relation with their ends projecting into the crevices of the opposed beams and engaging respectively the lower and upper surfaces of the horizontal flanges of the beams and angle irons.

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