

Aug. 6, 1940.

C. M. NEELD

2,210,252

BRIDGE FLOORING

Filed July 23, 1938

3 Sheets-Sheet 1

Fig. 1.

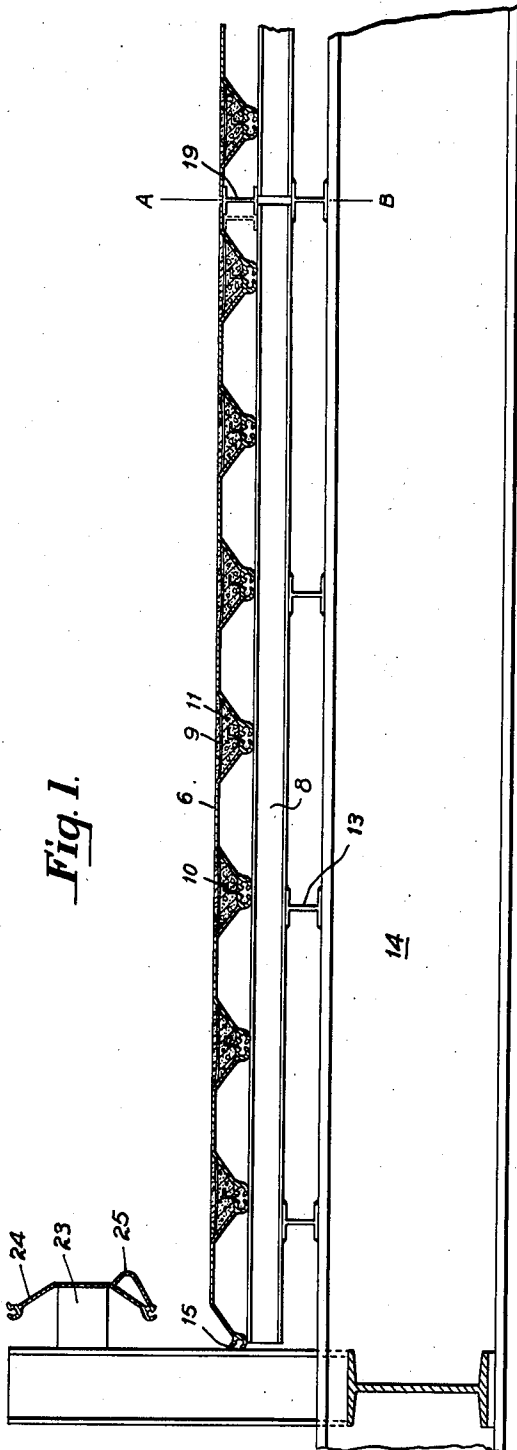
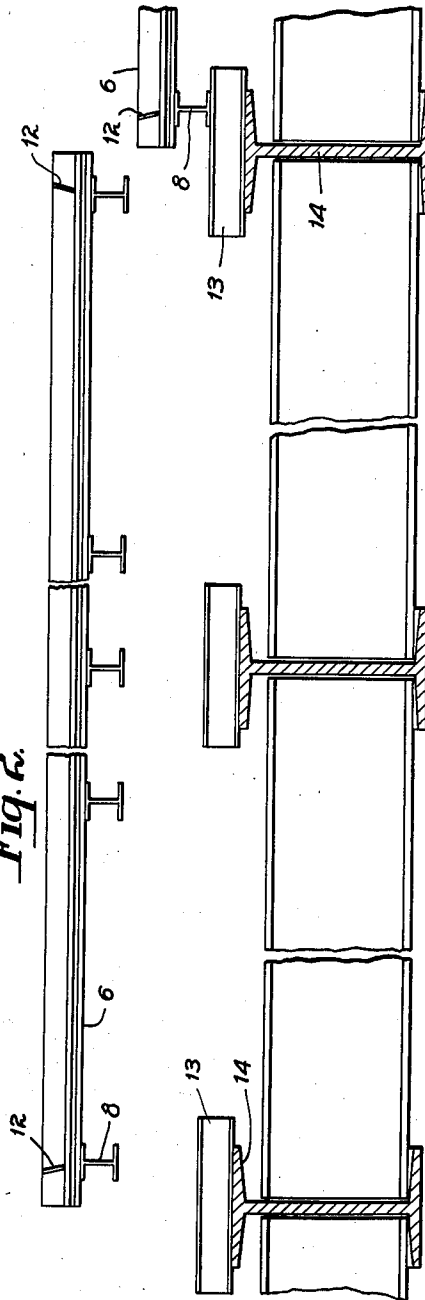


Fig. 2.



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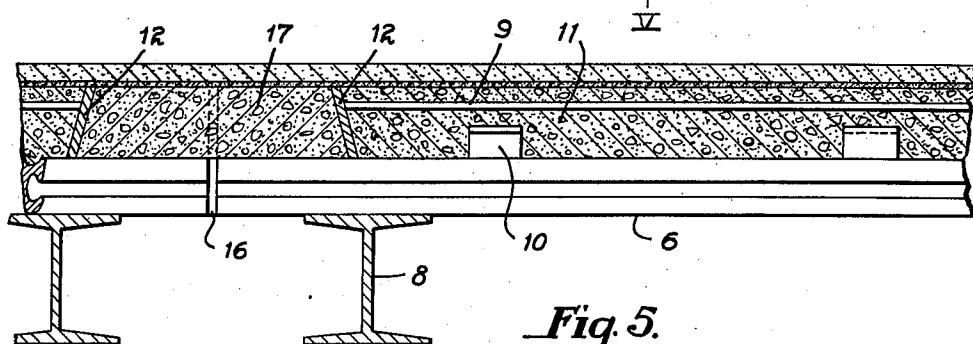
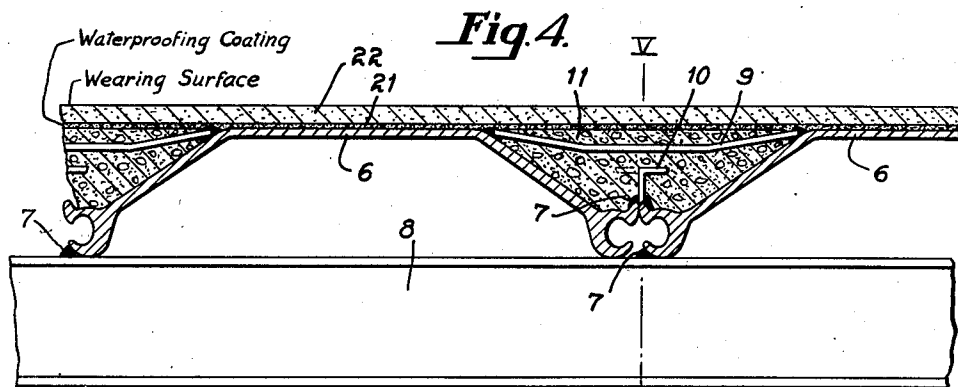
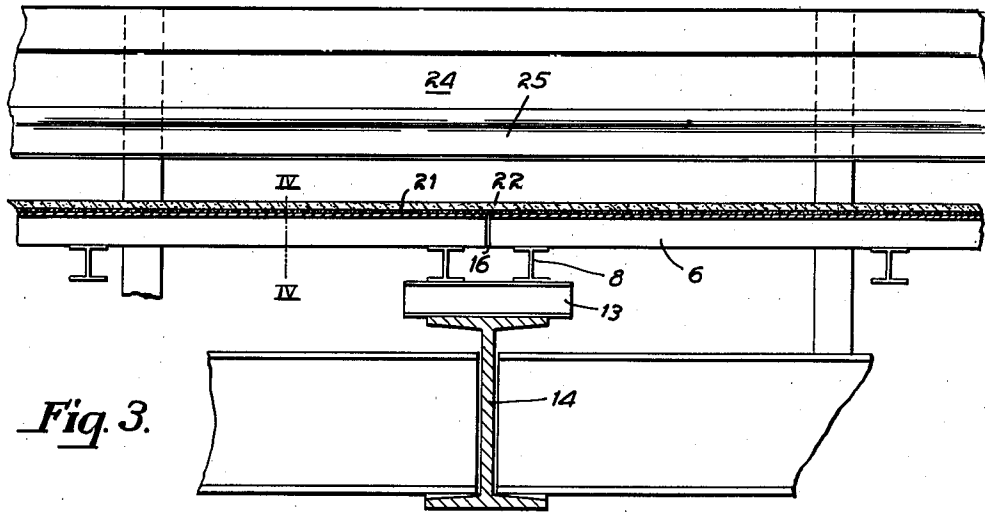
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Fig. 6.

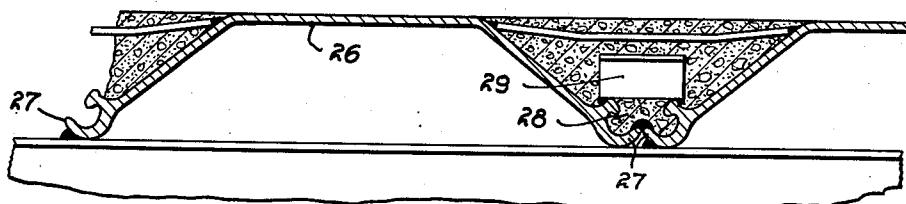


Fig. 7.

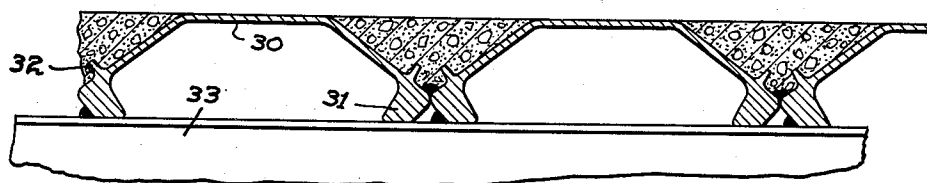


Fig. 8.

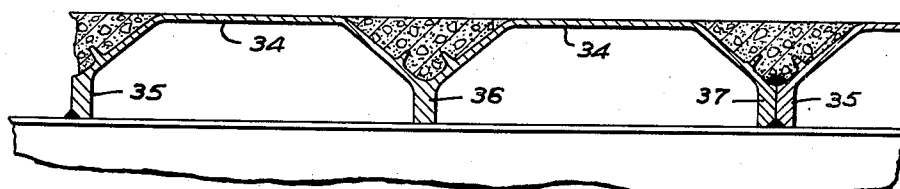
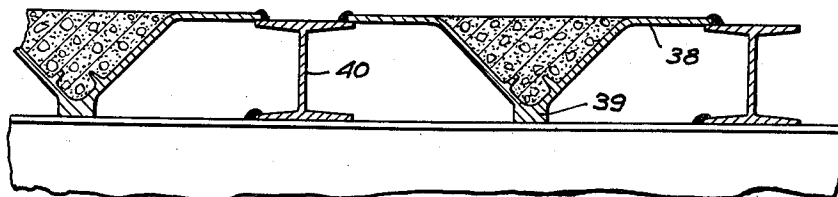


Fig. 9.



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UNITED STATES PATENT OFFICE

2,210,252

BRIDGE FLOORING

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Application July 23, 1938, Serial No. 220,888

5 Claims. (Cl. 14-73)

My invention relates to bridge flooring and the like, and more particularly to flooring units of such character that they can readily be preformed and then installed on a bridge or the like.

5 In replacing the flooring of old bridges, it commonly is necessary to close off the bridge to the movement of traffic if serious interference is to be avoided as between the operations of the workmen and public travel.

10 By the use of my invention it is possible to replace bridge flooring in each of a plurality of traffic lanes or vehicle widths, without substantial interruption of travel or restriction to operations of the workmen.

15 A further advantage of my invention resides in the fact that the flooring can be preformed in large sections and then moved to the bridge and quickly placed in areas where old sections of flooring have been removed. This preforming of the floor sections can be effected indoors, independently of weather conditions, and traffic can move across the same immediately upon installation thereof.

25 Flooring units constructed according to my invention and the manner of installing the same are shown in the accompanying drawings wherein Figure 1 is a transverse sectional view through the roadway of a bridge; Fig. 2 is a fragmentary side elevational or longitudinal view thereof, but with one of the floor sections in elevated position previous to the placing of the same on the floor beams of the bridge; Fig. 3 is a longitudinal sectional view showing the floor slabs or sections of Fig. 2 in assembled position; Fig. 4 is a view on an enlarged scale taken on the line IV-IV of Fig. 3; Fig. 5 is a view taken on the line V-V of Fig. 4; and Figs. 6, 7, 8 and 9 are views similar to Fig. 4, but respectively showing modified forms of arch beams.

40 The present invention constitutes an improvement upon that shown in my Patent 2,110,235, issued March 8, 1938. In the present instance the preformed slabs are built up to a size of perhaps 60 feet in length and 11 feet in width. Each slab comprises a series of arch beams 6 whose abutting edges are welded together at proper intervals throughout their lengths, as indicated at 7 in Fig. 4, and are also welded to cross beams 8. Reinforcement mesh 9 extends lengthwise of the arch beams and has its longitudinal edges welded to the sides of the beams. Anchoring plates 10 are welded to the beams, to assist in retaining the concrete 11 in place. Dam plates 12 are welded into the spaces between adjacent beams, near the ends thereof to keep said ends clear of the

concrete filling 11 when it is being poured. The concrete 11 (which may be of cement and sand) is poured after the said welding operations are completed, to such depth that its upper surfaces will be flush with the top surfaces of the arch beams 6. After this concrete has hardened, the slab is ready to be placed as part of a bridge floor, in end-to-end relation with other slabs.

The slabs are shown as set upon chairs or spacer blocks 13 which have been welded to floor beams 14 and are then welded to the cross beams 8 of the slabs, although the beams 8 could be set directly upon the beams 14. At the edges of the roadway, the slabs are welded to structural members of the bridge, as indicated at 15.

The ends of the longitudinally-extending arch beams of one section are then welded to the ends of the arch beams of an adjacent section, as indicated at 16, through the deposit of welding metal thereon. Thereupon the spaces between adjacent dam plates 12 are filled with quick-setting concrete 17, temporary blocks, or other suitable material, the inclined plates 12 serving to anchor said filling in place. The sections can then be subjected to ordinary highway travel without the necessity of first applying the paving surface.

Ordinarily one traffic lane of a bridge will be fully completed by the placing of the preformed slabs in end-to-end relation, as above explained, and thereafter an adjoining traffic lane will be built in like manner, of assembled slabs, the line a-b in Fig. 1 indicates the longitudinal line of division between the two traffic lanes. When a slab is initially formed, one half of the arch beam along one edge thereof is cut off, leaving only one-half of the web, which rests upon a beam 19. Initially this beam is positioned as shown by dotted lines in Fig. 1, to afford temporary support at the edge of the first slab. Preliminary to placing the adjacent slab, the beam 19 is shifted to its full line position and then serves as a permanent support for the edges of both slabs. Not only does this arrangement permit of fitting the slabs to roadways whose width is not an exact multiple of the widths of the arch beams, since a greater or less amount of the innermost arch beams can be cut away to provide for the proper width, but no pouring of concrete is required after the slabs are placed, as would be the case if the edges of two full arch beams abutted along the longitudinal line of division between the traffic lanes.

Surfacing material is then placed upon the slabs, such material preferably consisting of a thin layer 21 of water-proof material such as a

pitch or asphalt, upon which is placed a paving material 22 of "Amesite," bituminous concrete or the like.

In replacing the flooring of old bridges where there are two or more traffic lanes, sections can be cut out of the one traffic lane, leaving the major portion of the bridge, or at least one lane thereof, open for use, the preformed slabs then being placed one by one to replace the cut-out sections. By suitable trucks the slabs will be moved along the adjacent traffic lane and quickly moved over their place, permitting regular traffic flow along adjacent lane with less delay usually than is caused by a traffic light. When paving of one traffic lane has been completed, another traffic lane can similarly be replaced. The surfacing material can be placed upon each lane of slabs immediately after they are positioned on the bridge or can be deferred until all lanes of slabs have been laid.

As shown in Fig. 1, the structure of the bridge has secured thereto spacer blocks or plates 23 to which is in turn secured a traffic guard member 24 which may be of the same form as the arch beams 6. To the lower portion of this member 24 is welded a buffer rail 25 that projects outwardly from the traffic guard 24 sufficiently far to be engaged by the tires of vehicle wheels. The member 25 is located in a plane below the hubs and foot boards of vehicles, and projects toward the roadway sufficiently far to prevent foot boards and hub caps from hitting the guard member 24. The guard member 24 is located in vertically spaced relation to the bridge paving, so that dirt can be disposed of simply by sweeping it from the bridge floor over the side.

In Fig. 6 I have shown arch beams 26 of somewhat different form than the beams 6, this beam being another form of standard rolled section. In this section 26, the flanges are of somewhat different shape than the flanges of Fig. 6, in that their edgemoat portions 27 have direct abutting engagement with one another and are welded together, leaving recesses or pockets 28 that can be filled with the concrete and interlock therewith. The anchor plates 29 in this structure extend crosswise of the beams instead of extending parallel thereto as in Fig. 4. Also in this structure the metal at the underside of the slab is more conveniently accessible for painting.

In Fig. 7, the arch beams 30 may be made of rolled shapes. These beams have bulbs or thickened portions 31 formed on the edges of their flanges to provide for greater strength, so that the metal of the beam is distributed in such manner that the neutral axis thereof will be in approximately the horizontal mid plane of the beam, which, of course, gives a structure of maximum strength. Projections or flanges 32 are formed on the beams 30 to serve as anchoring elements for holding the concrete in place. The lower edges of the members 31 are flattened so as to give an extended area of contact with the beam 33.

In Fig. 8, I show an arch beam of such form that two arch portions 34 can be rolled from a single bar, each beam therefore being of double width, as compared to the arch beams of other figures. In this structure also, sufficient metal is provided in the flanges at 35, 36 and 37, as to locate the neutral axis in the mid plane of the beam.

Fig. 9 shows still another form of rolled arch beams 38, wherein the mid portions extend down-

wardly and are thickened as indicated at 39. The longitudinal edges of the beams 38 are supported by and welded to beams 40. This arrangement not only has very great strength, but is more readily adaptable to being built up into sections of various widths.

The invention also is useful in connection with the building of new bridges, because one lane of slabs can be laid thereon and immediately opened to traffic, the slabs for the other lane being transported along the completed lane and set into place without any prolonged interruption to traffic. The slabs are preferably of such large dimensions that they cannot readily be transported by highway or railroad in the usual manner, but will more conveniently be made in the vicinity of the bridge, and the work of assembling the arch beams, welding them, and filling in the concrete can be conducted in tents, while the framework of the bridge is being constructed. The slabs can then immediately be placed on the bridgework, thus saving the time which would otherwise be required in installing the roadway portion of the bridge if the flooring elements were not largely preformed.

I claim as my invention:

1. A roadway comprising slabs each formed of arch beams disposed in side-by-side relation, means rigidly connecting the arch beams of each slab, paving material filling the space between the arch portions of adjacent beams, to points adjacent to the ends thereof, leaving portions of the beams exposed at said ends for connection to adjacent beams, anchoring means for holding the material in said space, means connecting the ends of adjacent slabs, filling material covering the said exposed portions of the beams, and means for anchoring said filling material in place.

2. A roadway comprising slabs each formed of arch beams disposed in side-by-side relation, means rigidly connecting the arch beams of each slab, dam plates secured between the arch portions of adjacent beams, at points near the ends of said beams, and leaving portions of the beams exposed at said ends for connection to adjacent beams, the dam plates being inclined with their upper edges nearer to the extremities of the beams, means connecting the ends of adjacent slabs, and paving material filling the spaces between the arch portions of the arch beams.

3. A paving slab comprising arch beams arranged in side-by-side relation with their flanges secured to beam members disposed crosswise thereof, and concrete filling the spaces between the arch portions adjacent the beams, to a height flush with the upper surfaces of the arch beams, the cross beams being of a length approximately equal to the combined widths of the arch beams and the slab being transportable for positioning upon the floor sills or the like of a bridge.

4. A paving slab comprising arch beams arranged in side-by-side relation with their flanges secured to beam members disposed crosswise thereof, and concrete filling the spaces between the arch portions adjacent the beams, to a height flush with the upper surfaces of the arch beams, the cross beams being of a length approximately equal to the combined widths of the arch beams and the slab being transportable for positioning upon the floor sills or the like of a bridge, the arch beam along one edge of the slab being cut away, to provide space for the insertion of a beam member between said arch beam and the cross beams, adjacent to said edge.

5. A paving slab comprising arch beams ar-

5 ranged in side-by-side relation with their flanges secured to beam members disposed crosswise thereof, and concrete filling the spaces between the arch portions adjacent the beams, to a height flush with the upper surfaces of the arch beams, the cross beams being of a length approximately equal to the combined widths of the arch beams and the slab being transportable for positioning upon the floor sills or the like of a bridge, the arch beams having their tops flattened and the widths of the said tops and the said filled spaces being approximately equal. 5

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