

Dec. 26, 1944.

C. O. EMERSON

2,366,151

LONG SPAN, CONTINUOUS BAR, MOMENT RESISTING,
RETICULATED, GRATING PANEL
Filed Feb. 5, 1943

2 Sheets-Sheet 1

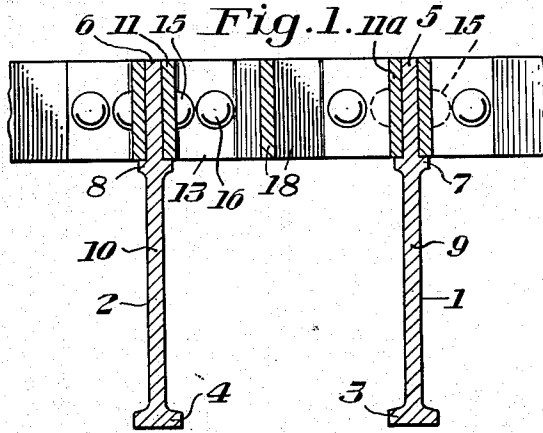
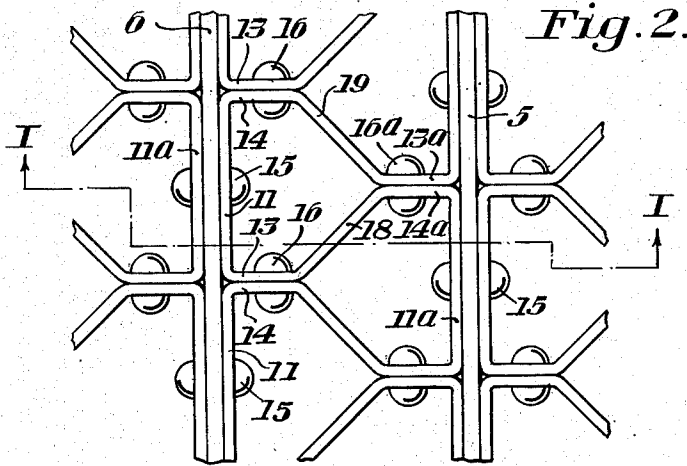
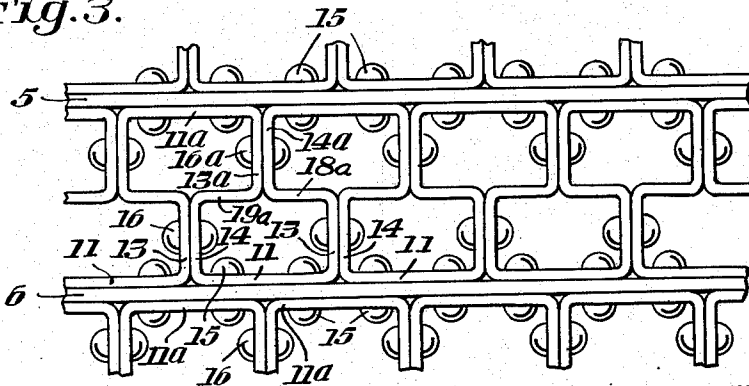


Fig. 3.



INVENTOR
CHARLES O. EMERSON,
by: *John E. Jackson*
his Attorney.

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2 Sheets-Sheet 2

Fig. 4.

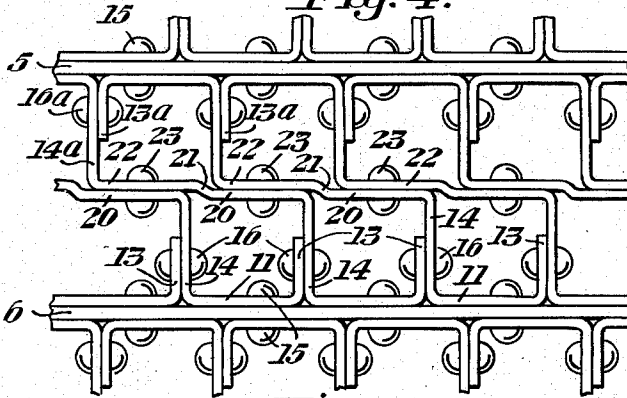


Fig. 5.

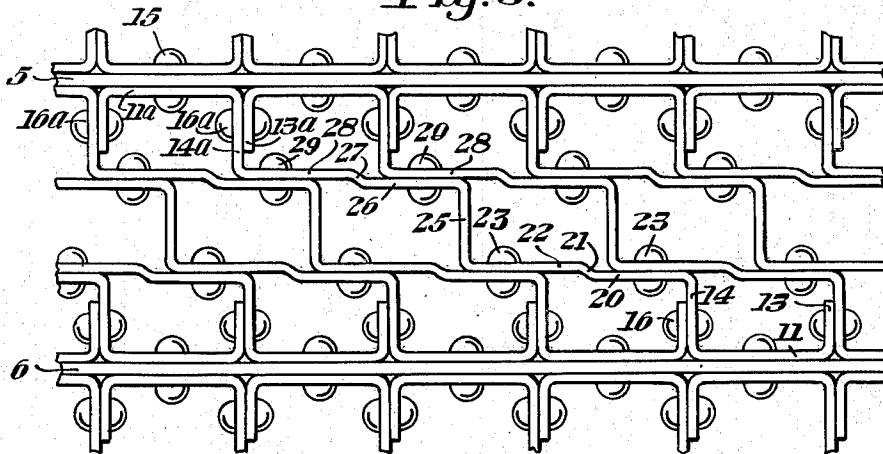
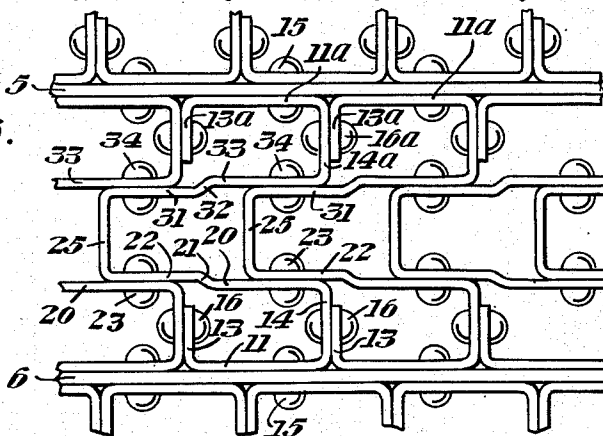


Fig. 6.



INVENTOR

CHARLES O. EMERSON,
by: John E. Jackson
his Attorney.

UNITED STATES PATENT OFFICE

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LONG SPAN, CONTINUOUS BAR, MOMENT
RESISTING, RETICULATED GRATING PAN-
EL

Charles O. Emerson, Pittsburgh, Pa.

Application February 5, 1943, Serial No. 474,862

3 Claims. (Cl. 189-82)

This invention relates to an improved grating structure, which may have a wide variety of applications to sidewalks, roads, platforms, garage floors, bridges, airplane landing fields, and the like, and is intended to apply where the grating may be assembled in unit panels on suitable spaced supports such as stringers, beams, girders, columns, posts and the like.

The conventional grating structure consists of spaced main carrying bars or beams with a system of interlaced or reticulated bars between them, the entire assembly providing the finished roadway surface. The main carrying bars or beams carry the major part of the resisting moment of the floor structure, while the secondary reticulated bars contribute very little to strength, thus keeping the spans to low limits.

It is an object of this invention to so dispose the reticulated bars as to have them contribute substantially to the resisting moment, thus increasing the limits of the spans and reducing the total weight in the structure.

This and other objects will be more apparent after referring to the following specification and attached drawings, in which:

Figure 1 is a sectional view taken on the line and looking in the direction of the arrows I—I of Figure 2;

Figure 2 is a plan view of Figure 1; and

Figures 3 to 6 are plan views showing modified forms of the invention.

As shown in Figures 1 and 2, the primary longitudinally extending main load carrying members 1, 2 are spaced apart the distance which is to be spanned by the reticulated grating structure. The longitudinal members 1, 2 may be provided with base portions 3, 4, which may in turn be carried by other supports such as columns, girders, beams and the like depending upon the particular application and use of the grating structure. The load carrying members 1, 2 include vertical body or web portions 9, 10 and may be provided with longitudinally extending ribs 7, 8 below the top of the members 1, 2, this forming upper portions 5, 6 of the load carrying members, which portions are equal substantially to the depth of the reticulated structures which they support. The reticulated structure includes longitudinal portions 11 which extend continuously along the right hand side of the longitudinal members, and similar portions 11a which extend along the left side of the longitudinal members as shown in Figures 1 and 2. These portions, which will hereinafter be referred to as

the longitudinal portions of the reticulated structure cooperate with the top portions 5, 6 of the longitudinal members to form an upper flange member and act under load as a unit to increase the resisting moment of the entire structure. The reticulated structure is formed of a bar of substantially greater width than thickness as shown in Figure 1.

The reticulated structure of Figure 2 is shown as being formed from a single bar which is bent to form a pattern of pentagons, those to the left of Figure 2 being bounded by longitudinal portion 11, transverse portions 13, 14 and connecting portions 18 and 19. The pentagons to the right of Figure 2 are arranged in staggered relationship with the pentagons to the left and are bounded by longitudinal portion 11a, transverse portions 13a and 14a, and connecting portions 18 and 19.

It will be seen that the reticulated structure may be said to be formed from a plurality of "continuous bar units," each of which comprises a first transverse portion 13, a longitudinal portion 11, a second transverse portion 14, a connecting portion 19, a third transverse portion 13a, a longitudinal portion 11a and a fourth transverse portion 14a, with the "continuous bar units" integrally connected by portions 18. The first and second transverse portions of adjacent units are connected by means of rivets 16, and the third and fourth transverse portions of adjacent units are connected to each other by means of rivets 16a. The longitudinal portions are fastened to the longitudinal members by means of rivets 15.

It will be understood that the various portions may be fastened by means of welding or any other well known fastening means in place of the riveting shown, it only being necessary that the various portions are rigidly connected in order that the longitudinal portions will act as a unit with the longitudinal members 1, 2 in order to increase the resisting moment of the entire structure.

The reticulated structure disclosed in Figure 3 is similar to that disclosed in Figure 2 except that the portions 18 and 19 are bent at right angles to the portions 13 and 14 in order to form a rectangle instead of a pentagon. These portions are indicated as 18a and 19a, the remaining parts of the structure being given the same reference numbers as the corresponding parts in Figure 2.

It will be seen that the "continuous bar unit"

consists of a first transverse portion 13, a longitudinal portion 11, a second transverse portion 14, connecting portion 19a, a third transverse portion 13a, a longitudinal portion 11a, and a fourth transverse portion 14a, the only difference being the substitution of the connecting portion 19a for the connecting portion 19 of Figure 2. The "continuous bar units" are connected to each other and to the longitudinal members in the same manner as in Figure 2 except that two rivets 15 are used to fasten the longitudinal portions to the longitudinal members.

In Figure 2 the reticulated members have their portions 14 in the same plane as the portions 14a of the adjacent reticulated members, while in Figure 3 the transverse portion 14 lies in a plane offset from the transverse portion 14a of the adjacent reticulated members. However, it will be understood that the arrangement shown in Figure 2 may be used in Figure 3 and vice versa. In other words the openings in adjacent panels may be in either opposite or staggered relation regardless of what type of reticulated structure is being used.

Figure 4 discloses a further modification in which a plurality of bars are used to make the reticulated structure, each of the bars forming a "continuous bar unit." The arrangement of the openings is similar to that shown in Figure 3, that is, there are two longitudinal rows of rectangular openings, one row being offset in relation to the other row.

The various transverse and longitudinal portions of the "continuous bar unit" are the same as shown in Figures 2 and 3 and bear the same reference numerals. However, the connecting portion consists of a straight longitudinally extending portion 20 connected by an angular portion 21 to a second straight longitudinally extending portion 22. The portion 20 of one "continuous bar unit" is connected to the portion 22 of the adjacent "continuous bar unit" by means of rivet 23.

Figure 5 discloses a further modification similar to Figure 4, but having three longitudinal rows of rectangular openings, the middle row being offset with respect to the two outer rows. The connecting portion of the "continuous bar unit" includes in addition to the portions 20, 21 and 22, the transverse portion 25 connected to a longitudinal portion 26, which is connected by means of a diagonal portion 27 to a longitudinal portion 28. The portion 26 of one "continuous

bar unit" is connected to the portion 28 of an adjacent "continuous bar unit" by means of rivet 29. With this exception, the arrangement and connections of the various portions are identical to that shown in Figure 4.

Figure 6 discloses a further modification in which the openings are arranged in the same manner as in Figure 5, but are formed in a different manner. The "continuous bar unit," instead of being bent to the left of portion 25 as shown in Figure 5, is bent to the right and has a longitudinal portion 31 connected by means of the diagonal portion 32 to a second longitudinal portion 33. The longitudinal and transverse portions of the "continuous bar unit" are the same as in the previous embodiments and bear the same reference numerals, but the connecting portion of each "continuous bar unit" consists of portions 20, 21, 22, 25, 31, 32 and 33. Portion 31 of one "continuous bar unit" is connected to portion 33 of an adjacent "continuous bar unit" by means of rivet 34.

While several embodiments of the invention have been shown and described, it will be understood that other adaptations and modifications may be made without departing from the scope of the following claims.

I claim:

1. A grating structure comprising a plurality of spaced longitudinal supports and a reticulated structure extending between each pair of supports, said reticulated structure including a plurality of continuous bar units, each continuous bar unit comprising a first transverse portion, a longitudinal portion, a second transverse portion, a connecting portion, a third transverse portion, a longitudinal portion and a fourth transverse portion, said portions being connected to each other in the order named, the first and second transverse portions of adjacent units being connected, and the third and fourth portions of adjacent units being connected, and the longitudinal portions being secured to the upper part of and extending continuously along the longitudinal supports.

2. A grating structure as defined in claim 1 in which the reticulated structure includes a plurality of openings of similar form.

3. A grating structure as defined in claim 1 in which the reticulated structure includes a plurality of openings of similar form arranged in staggered relationship between the longitudinal supports.

CHARLES O. EMERSON.