May 19, 1942. R. J. BARRY ET AL 2,283,307

GRATING

Original Filed Sept. 27, 1940

Fig. 1.

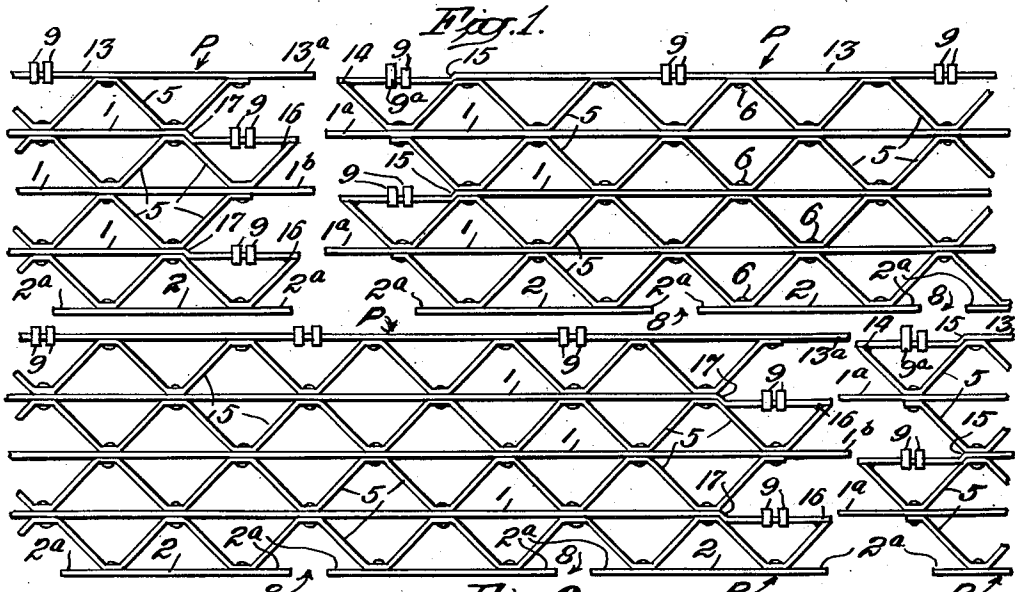
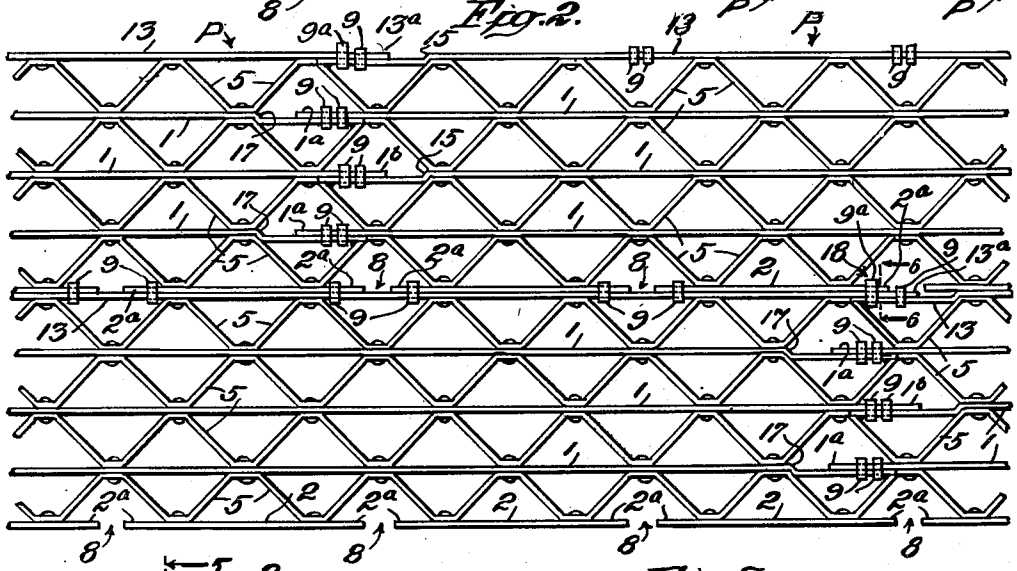


Fig. 2.



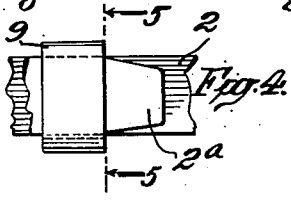
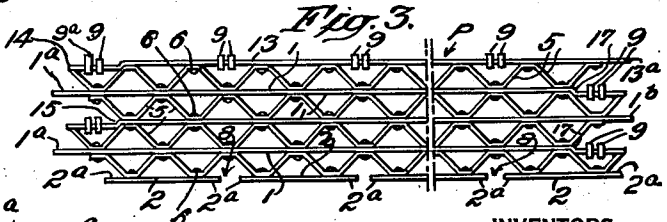


Fig. 4.

Fig. 3.



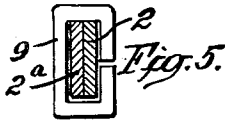


Fig. 5.

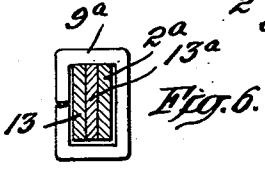


Fig. 6.

INVENTORS
RICHARD J. BARRY
CARL RASMUSSEN
BY
ATTORNEY

Patented May 19, 1942 2,283,307

UNITED STATES PATENT OFFICE

2,283,307

GRATING

Richard J. Barry, New York, and Carl Rasmussen, Flushing, N. Y., assignors to Walter Edward Irving, Glenbrook, Conn.

Original application September 27, 1940, Serial No. 358,598. Divided and this application January 2, 1941, Serial No. 372,706

9 Claims. (Cl. 94—30)

This application is a division of our co-pending application, Serial No. 358,598, entitled "Gratings" and filed September 27, 1940.

The invention relates to improvements in sectional gratings of a type in which standardized grating sections or panels are arranged edge to edge and coupled together in succession to produce a continuous grating of a required area.

Important objects of the invention are to provide, for such a grating, improved coupling means designed to greatly facilitate assembly and connection of the panels and also greatly facilitate dismantling of the grating; and to provide such a grating with coupling means which remain permanently assembled with the individual panels, are designed and located for easy assembly of the panels and quick and easy connection and disconnection thereof and avoid the usual laborious and time-consuming bolting, riveting or welding operations and the difficulties of dismantling consequent to the usual connections. Other objects of the invention will appear hereinafter.

The improved grating and its coupling means were devised especially for the construction of a large airplane landing mat for military service in an airfield. The invention provides for quick construction of such a mat at an emergency location and for quick dismantling of the mat and removal of its parts should its location be discovered by the enemy and rendered untenable. The invention also provides for quick and easy removal and replacement of damaged panels in any part of the mat without disturbing any of the other panels and their connections. While the invention is well suited for the purpose mentioned its utility is by no means confined to such service. It may be employed very advantageously in sectional grating structures for many other services.

In the drawing:

Fig. 1 is a plan view of several of the grating panels embodying the invention and showing them separated and partly broken away;

Fig. 2 is a view similar to Fig. 1 showing the panels coupled together to form a continuous grating;

Fig. 3 is a reduced-scale plan view of one of the panels embodying the invention;

Fig. 4 is a detail side elevation of one of the coupling connections between adjoining panels;

Fig. 5 is a detail section on the line 5—5 of Fig. 4; and

Fig. 6 is an enlarged detail section on the line 6—6 of Fig. 2.

For the construction of a continuous grating a number of metal grating panels P are provided. These may all be of the same size, shape and construction to render them interchangeable, and a description of one panel will suffice for all. The panel is of elongated and approximately rectangular form. Dimensions of twelve and one-half feet length and between one and two feet width have been found satisfactory for convenient handling of the panel. The panel is constructed of flat metal bars or strips arranged on edge and defining the grating meshes. There are a number of straight inner bars 1 arranged in parallel, equally spaced relation and running longitudinally of the panel. Along one longitudinal edge of the panel there is a series of straight bars or strips 2 extending lengthwise of the panel parallel to the bars 1 and arranged in endwise opposed, spaced relation. The transverse spacing of the bars 2 from the adjacent bar 1 corresponds to the spacing of the bars 1 from each other. Along the opposite end of the panel there is a straight strip 13 extending from end to end of the panel and spaced approximately the same distance from the adjacent strip 1 as the strips 1 are spaced from each other. In the spaces between the strips 1 and between the outermost ones of said strips and the strips 2 and the strip 13 there are bars or strips 5 bent into approximate zig-zag form and permanently secured at their bends to the respective bars 1, 2 and 13 by rivets 6 or by welding. Thereby all of the bars or strips are rigidly and permanently united in a unitary panel structure.

Each of the side edge bars 2 is of sufficient length to bridge the space between two consecutive bends of the strips and extend materially beyond said bends to form coupling tongues 2^a. The opposed, spaced ends of these tongues define a series of gaps 8 all of approximately the same width and equally spaced along the panel. The strips 2 form the outer sides of alternate meshes along this longitudinal edge of the panel and fully close said meshes. Strip 13 forms the outer side of closed meshes all along that edge of the panel.

Strip 13 slidably bears a series of pairs of coupling elements 9. These pairs of elements are located upon spaced portions of the strip which form the outer sides of alternate meshes along the panel. Each of these coupling elements or slides is formed of a stout, flat strip of metal bent into a rectangular loop or ring and with its opposed ends unsecured. The gauge of the metal forming the ring may be approximately

that of the strips or bars forming the panel and the ring is large enough to slidably receive two thicknesses of the strips. The width of the rings along the strip 13 and the width of the said gaps 8 are so correlated that a pair of the rings, when closely arranged side by side, can freely enter a corresponding gap in a companion panel. Each pair of rings is confined by the closed mesh in which the pair is located and the sliding movement of the rings of the pair is limited by portions of the strip 5 forming opposite sides of the mesh. By this confinement and by the anchoring engagement of the rings with the strip 13 the rings are permanently retained upon the panel and have a limited sliding movement thereon between coupling and release positions.

At each end of the panel there are closed meshes alternating with open meshes and said closed meshes upon the two ends are in staggered relation across the panel. At one end of the panel the bar 13 and the strip 5 secured thereto have their adjacent ends welded together, as at 14, to form one of said closed meshes. Another of said meshes is formed by welding together the adjacent ends of the central bar 1 and another of the strips 5. The adjacent end portions of the other bars 1 extend to form coupling tongues 1a. The portions of the central bar 1 and the edge bar 13 which form sides of said closed meshes each slidably bears a pair of the coupling rings 9. These bar portions are bent, as at 15, to offset them the thickness of the bar material from the body of the bars. At the opposite end of the panel the closed meshes are formed by welding the ends of the outer ones of the bars 1 to the adjacent ends of the strips 5, as at 16. The portions of said bars 1 which form sides of said closed meshes are bent, as at 17 to offset them the thickness of the bar material and each slidably bears a pair of the coupling rings 9. At this end of the panel the end portion of the central bar 1 forms a coupling tongue 1b, and the end portion of the edge bar 13 forms a coupling tongue 13a. The rings at the end of the panel are also permanently held to the panel and confined by the closed end meshes for limited sliding movement.

In assembling the panels P to form a continuous grating companion panels are arranged side to side in longitudinally staggered relation to dispose pairs of the coupling rings 9 borne by the long edge bar 13 of one panel in register with the gaps 8 between the short edge bars 2 of a companion panel and bringing said panels together with the bar 13 flat against the bars 2 and the coupling rings within said gaps. Then, the coupling rings of each pair are forced in opposite directions and slid over the tongues 2a to splice the panels together side to side. For joining companion panels end to end the tongues 1a, 1b and 13a are placed in overlapping relation to the offset portions of the bars 1 and 13 which bear the coupling rings at the opposite ends of the two panels and the said rings borne by one panel are slid over the tongues borne by the other panel to splice the panels together end to end. Provision is also made for splicing together three panels two of which are joined end to end and one of which extends across the joint with its edge strip 13 against the bars 2 of both said joined panels. For that purpose one of the pair of coupling rings 9 borne by the adjacent end portion of the strip 13 of one of the end to end panels, is made to form a larger loop designated 9a. This loop is of a size to receive both a side tongue 2a of the panel which extends across the said joint and the end tongue 13a of one of the end to end panels. This splicing of the three panels is shown at 18 in Fig. 2. Each panel may be provided with one of these large rings to make a three-panel splice wherever three panels come together in the assembly.

It will be seen that the panels and coupling means are designed for conventient and rapid assembly and coupling of the panels. The coupling tongues and rings of each panel are permanently borne by the panel and are in positions for quick connection with the coupling means of other panels. The panels and their coupling means are also designed for convenient and rapid dismantling of the grating or for removal and replacement of a damaged panel located in any position in the length or width of the assembled grating. Any one of the panels may be uncoupled by merely driving to their release positions the coupling rings which hold the panel to the adjoining panels. Then the uncoupled panel may be freely lifted from the assembly.

In addition to the advantages mentioned the coupling means have a desired strength and durability and at the same time afford a desired yield in the connection between the panels to avoid breaking strain under heavy traffic and accommodate the grating to unevenness of the ground upon which it is laid. The sliding fit of the coupling rings upon the bars and tongues which they embrace affords clearance for some flexure between the panels and, in addition to that, the split coupling rings can spring slightly under a heavy weight upon the grating and avoid breaking strain.

What we claim is:

1. A traffic-bearing grating comprising a plurality of side-by-side rows of elongated grating panels with the panels of each row arranged end to end and side by side with the panels of an adjoining row to form a continuous grating of all of said panels; releasable coupling connections between the individual side-by-side panels of said rows and each of said connections comprising a coupling tongue borne by one panel, a coupling slide borne by the sidewise adjoining panel and engaging said tongue and means supporting and constantly retaining said slide for sliding upon its respective panel longitudinally of the latter between coupling and release positions; and releasable coupling connections between the successive end-to-end panels of each row and each comprising a coupling tongue borne by one panel and extending from an end thereof longitudinally of the panel, a coupling slide borne by an endwise adjoining panel and engaging the latter tongue, and means supporting and constantly retaining the latter slide for sliding upon its respective panel longitudinally of the panel between coupling and release positions.

2. A traffic-bearing sectional grating comprising abutting grating sections each formed along an edge thereof with closed meshes and fixed coupling tongues alternating with the meshes along said edge and projecting transversely from the edge, each of said meshes comprising a straight strip forming one side of the mesh and parallel to said tongues, the coupling tongues of each section partly overlapping longitudinally said mesh sides of the other of the abutting sec-

tions respectively, and coupling slides borne by and anchored to said mesh strips against transversely separation therefrom and engaging said tongues respectively and formed to hold the tongues against transverse separation from the strips and confined for sliding along the strips, within the limits of the closed meshes respectively, between coupling position and release position free from the tongues, for coupling and uncoupling the sections.

3. A traffic-bearing grating including a grating panel including a fixed strip extending along an edge of the panel and forming the outer side of a series of closed meshes along said edge, a companion panel arranged in edgewise opposition to said edge of the first panel and including a series of fixed endwise opposed spaced strips extending along the panel edge opposed to said first edge and forming pairs of endwise opposed spaced coupling tongues, a series of pairs of coupling slides borne by said strip of the first panel at a plurality of the meshes closed by the strip and anchored to the strip against transverse separation and the slides of each pair engaging a respective pair of said tongues and being formed to anchor the tongues against transverse separation from said first panel and thereby couple the panels together, the slides of each pair being confined by the closed mesh at which it is located and slidable, within the limits of the mesh, along said strip bearing them, between coupling position and release position closer together and at the space between the respective pair of tongues and free of the tongues, for uncoupling the panels, and the combined width of each pair of slides being correlated with the space between the respective tongues to permit the slides to pass through said space for separation of the panels, other grating panels in edgewise opposition to edges of said coupled panels transverse to said first edges, and slide coupling means slidable parallel to said first edges to couple said other panels to the first panels at said transverse edges and uncouple said first panels and said other panels at said transverse edges.

4. A traffic-bearing grating including a grating panel including a fixed strip extending along an edge of the panel and forming the outer side of a series of closed meshes along said edge, a companion panel arranged in edgewise opposition to said edge of the first panel and including a series of fixed endwise opposed spaced strips extending along the panel edge opposed to said first edge and forming pairs of endwise opposed spaced coupling tongues, and a series of pairs of coupling slides borne by said strip of the first panel at a plurality of the meshes closed by the strip and anchored to the strip against transverse separation and the slides of each pair engaging a respective pair of said tongues and being formed to anchor the tongues against transverse separation from said first panel and thereby couple the panels together, the slides of each pair being confined by the closed mesh at which it is located and slidable, within the limits of the mesh, along said strip bearing them, between coupling position and release position closer together and at the space between the respective pair of tongues and free of the tongues, for uncoupling the panels, and the combined width of each pair of slides being correlated with the space between the respective tongues to permit the slides to pass through said space for separation of the panels.

5. A grating panel including a fixed strip extending along an edge of the panel and forming the outer side of closed meshes along said edge, a series of pairs of coupling slides borne by said strip at a plurality of said meshes along the strip and each pair confined for sliding along the strip, within the limits of the respective meshes, to slidably engage coupling tongues upon a companion panel, said slides being anchored to the strip against transverse separation therefrom and formed to anchor said tongues against transverse separation from the strip, and a series of fixed endwise opposed shorter strips extending along the opposite edge of the panel and with the end portions of adjacent strips forming a series of pairs of endwise opposed spaced coupling tongues to slidably receive coupling slides upon another companion grating panel.

6. A grating panel according to claim 5, characterized in that the panel is of elongated form, said strip-bearing edges extend longitudinally of the panel and the panel includes, along each of its opposite end edges, a plurality of closed meshes and fixed coupling tongues alternating with the meshes along the end edge and projecting transversely from said end edge to slidably receive coupling slides upon a companion panel, each of the last-mentioned meshes comprising a straight strip forming one side of the mesh and parallel to the last-mentioned tongues, and coupling slides are borne by the last-mentioned strips for sliding therealong, within the limits of said last-mentioned meshes, into and out of coupling engagement with similar coupling tongues upon a companion panel, the last-mentioned slides being anchored to the respective last-mentioned strips against transverse separation therefrom and formed to anchor the last-mentioned tongues against transverse separation from the last-mentioned strips.

7. A grating panel including along an edge thereof a plurality of closed meshes and fixed coupling tongues alternating with said meshes along said edge and projecting transversely from said edge to slidably receive coupling slides upon a companion panel, each of said meshes comprising a straight strip forming one side of the mesh and parallel to said tongues, and coupling slides borne by and anchored to said mesh strips against transverse separation therefrom and confined for sliding along the strips, within the limits of the closed meshes respectively, to slidably engage similar tongues upon the companion panel and formed to anchor the engaged tongues against transverse separation from the strips.

8. A grating panel according to claim 7, characterized in that each of the said slides is in the form of a loop embracing the strip bearing it and is of a size to engage a respective one of said tongues upon the companion panel and the coupling slide borne by an outermost one of said strips along said edge is of a size to slidably engage a plurality of coupling tongues upon a plurality of companion panels and anchor the last-mentioned tongues against separation from each other and from said outermost strip to thereby couple together three panels.

9. A traffic-bearing grating comprising a plurality of side-by-side rows of elongated grating panels with the panels of each row arranged end to end and side by side with the panels of an adjoining row to form a continuous grating of all of said panels; releasable coupling connections between the individual side-by-side panels of said rows and each of said connections comprising a coupling tongue borne by one panel, a coupling slide borne by the sidewise adjoining panel and

engaging said tongue and means supporting and constantly retaining said slide for sliding upon its respective panel longitudinally of the latter between coupling and release positions; and releasable coupling connections between the successive end-to-end panels of each row and each comprising a coupling tongue borne by one panel and extending from an end thereof longitudinally of the panel, means forming a closed mesh of an endwise adjoining panel and including a straight strip extending longitudinally of the last-mentioned panel and forming one side of said mesh and overlapping said last-mentioned tongue longitudinally, and a coupling slide mounted upon said strip and confined by said mesh for sliding within the limits of the mesh between a coupling position in engagement with said last-mentioned tongue and an uncoupling position out of engagement with the tongue and formed to anchor together said overlapping strip and tongue against transverse separation.

RICHARD J. BARRY.
CARL RASMUSSEN.