

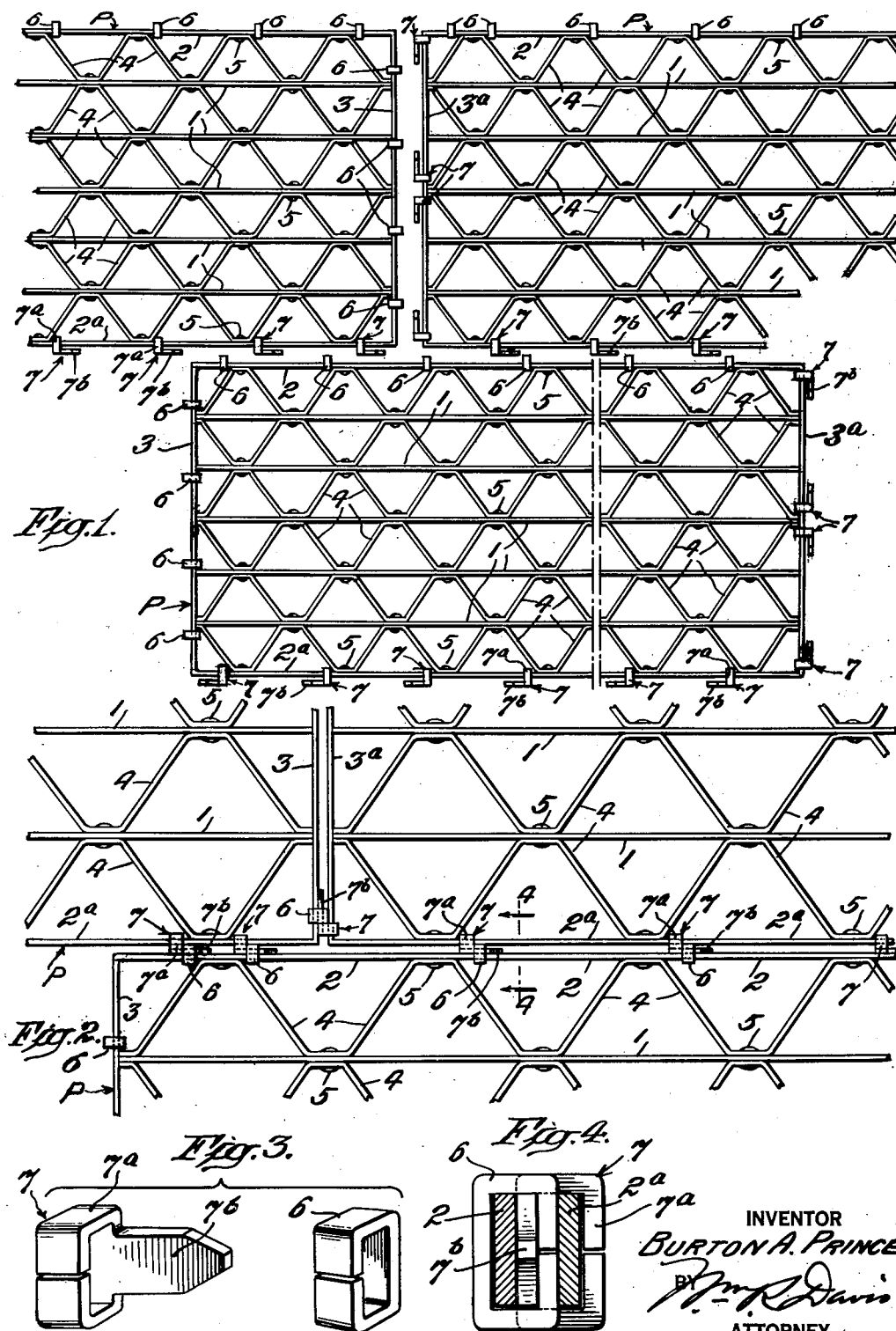
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GRATING

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GRATING

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This 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 upon a larger scale and showing the panels coupled together to form a continuous grating;

Fig. 3 is an enlarged detail perspective view of a pair of the cooperable coupling slides for coupling together adjoining grating panels; and

Fig. 4 is an enlarged detail section on the line 4—4 of Fig. 3.

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, 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 straight bar or strip 2 and along the opposite edge there is a similar strip 2^a. These strips extend the full length of the panel. Straight bars or strips 3 and 3^a extend along the opposite end edges of the panel. These end strips may be welded to the side strips at the corners of the panel or, the side strips and end strips may be made of a single strip bent into rectangular form and with its ends welded together. The spacing of the side strips from the adjacent strips 1 corresponds to the spacing of the latter from each other. In the spaces between the strips 1 and between the outermost ones of said strips and the strips 2 and 2^a there are bars or strips 4 bent into zigzag form and permanently secured at their bends to the respective strips 1, 2 and 2^a by rivets 5 or by welding. At their opposite ends the strips are welded to the strips 3 and 3^a respectively and also to the adjacent ends of the strips 1. Thereby all of the bars or strips are rigidly and permanently united in a unitary panel structure.

The strips 2 and 2^a form the outer sides of closed grating meshes along the longitudinal edges of the panel. Similarly, the strips 3 and 3^a form the outer sides of closed meshes along the end edges of the panel. Each of the four edge strips bears means for releasably coupling the panel to a companion grating panel. Side strip 2 bears a series of coupling slides 6 at the successive closed meshes along the strip. End strips 3 also bears several of these slides at certain of the closed meshes therealong. Each of these 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. The ring embraces the strip which bears it and is large enough to embrace also a cooperable coupling element upon an adjoining panel, as will be explained hereinafter. Each ring is confined by a respective closed mesh for sliding along the strip only within the limits of said mesh. Thereby the rings are permanently retained upon the panel and are held spaced apart along the strips which bear them.

Side strip 2^a bears, at the closed meshes therealong, a series of couplings and spacing

members in the form of slides 7 made of the same metal stock as the slides 6. Each slide 7 has a loop portion 7^a similar to the loops 6 and embracing the strip, and a tongue portion 7^b formed integrally with said loop portion. The tongue is disposed at the outer side of the strip and extends longitudinally of the latter. End strip 3^a also bears a number of these slides 7 at closed meshes therealong and corresponding in number to the slides 6 at the opposite end of the panel. The slides 7 at the side of the panel and those at the end of the panel are confined, by the meshes at which they are located, for sliding only within the limits of said meshes. Each tongue 7^b tapers at its free end and is formed to enter one of the slide loops 6 upon a companion panel.

Prior to assembly of the panels to form a continuous grating the slides 6 and 7 on each panel should be placed in positions to avoid sidewise collision with those of the companion panels. The slides borne by the side strips 2 and 2^a may be readily so positioned by tilting the panel about the end thereof bearing the strip 3^a so that the slides will all gravitate to one side of the respective meshes. Then the panel to be placed side-by-side with the first panel may be tilted about its end bearing the strip 3 so that the slides borne by the side strips will gravitate to the opposite side of the respective meshes. The panels can then be placed close together side-by-side in edgewise opposition without interference by the sides. After so placing the panels they may be readily coupled together by sliding the loops 6 along the panel strip 2 of one panel into embracing relation to the tongues 7^b of the other panel or by sliding the slides 7 along the strip 2^a of the latter panel to enter the tongues in the loops 6. For coupling panels end to end the end slides 6 and 7 are placed in positions so that they will not collide and the panels are placed in close edgewise opposition. Then the end slides 6 and 7 are interlocked in the same manner as the side slides. Each panel has the slides at its opposite ends in meshes which are in alignment longitudinally of the panel so that the slides will be arranged for cooperation with the slides upon endwise adjoining panels. Any one or all of the panels may be uncoupled by merely forcing the engaged slides 6 and 7 apart. The opposed strips of connected panels are spaced apart by the coupling and spacing members in such manner that an increased area of grating is secured by the means coupling the panels. This is important in a grating consisting of many thousands of panels.

It will be seen that the panels and coupling means are designed for convenient 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 forcing apart the engaged slides 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.

10 What I claim is:

1. A traffic-bearing sectional grating comprising a grating panel including a fixed strip along an edge thereof, a companion grating panel in edgewise opposition to said edge of the first panel to form therewith a continuous grating and including a fixed strip along its edge opposed to the first panel, a slide borne by said strip of the first panel and anchored to the first-mentioned strip against transverse removal therefrom and having a coupling tongue extending longitudinally of the first-mentioned strip, and a coupling slide borne by said strip of said companion panel and anchored to the latter strip against transverse separation therefrom and engaging said tongue and formed to hold the latter against transverse separation therefrom, said slides being individually slidable along the respective strips which bear them relatively to each other for engagement and disengagement of said coupling slide and tongue to couple and uncouple the panels.

2. A grating according to claim 1, characterized in that each of said panels has a closed mesh at the edge thereof along which the respective one of said strips extends, each strip forms the outer side of said closed mesh of its respective panel and the slide on each strip is at said mesh and confined for sliding within the limits of the mesh along its respective strip.

3. A grating according to claim 1, characterized in that each of said panels has a series of closed meshes along its edge at which the respective one of said strips is located, said strips extend from end to end of said edges of the panels and form an outer side of said series of closed meshes of their respective panels, a series of tongue-bearing slides, according to the one defined in said claim, are borne by the strip of the first panel at a plurality of said meshes therealong and are confined for sliding along their respective strip within the limits of the respective meshes at which they are located, and a plurality of tongue-engaging slides, according to the one defined in claim 1, are borne by the strip of the companion panel at a plurality of the closed meshes therealong and are in engagement with the tongues respectively and confined for sliding within the limits of the respective meshes.

4. A traffic-bearing sectional grating comprising a grating panel including a fixed strip extending along an edge thereof and a slide borne by said strip and anchored to the strip against transverse removal therefrom and having a coupling tongue rigid therewith and projecting longitudinally of the strip, a companion grating panel in edgewise opposition to said edge of the first panel to form with the latter a continuous grating, and a coupling loop borne by and anchored to the edge of the companion panel opposed to the first panel and embracing said coupling tongue to couple together the panels, said slide being slidable along said strip to enter said tongue in the loop for coupling the panels and to withdraw the tongue from the loop for uncoupling the panels.

5. A grating according to claim 4 and including a plurality of cooperating slides and loops, according to those claimed in said claim, spaced along the opposed panel edges and with the slides all borne by the said strip, and means borne by the first panel to confine the sliding movement of the individual slides to longitudinally spaced portions of the strip.

6. A grating section comprising an elongated panel having closed meshes along each of its edges and including fixed strips extending along the respective edges of the panel and each strip forming an outer side of closed meshes along the edge at which it is located, a plurality of coupling slides borne by the strips along one longitudinal edge and one end edge of the panel at different meshes along said side and end edges and slidable along the strips within the limits of the respective meshes and each slide comprising a loop portion embracing the respective strip and a coupling tongue projecting from the loop portion longitudinally of the strip, and a plurality of coupling loops borne by the strips along the opposite longitudinal edge and the opposite end edge of the panel at different meshes along said edges, and slidable along the respective strips within the limits of the respective meshes and each loop embracing the strip bearing it and formed to embrace also a coupling tongue, similar to the first-mentioned tongue, upon a companion panel, for releasably coupling the panel defined to a plurality of companion panels to form therewith a continuous grating.

7. A grating section comprising a panel including along each of two opposite edges thereof a fixed strip forming the outer side of closed meshes along the edge, a plurality of coupling slides borne by the strip along one of said edges at different ones of the closed meshes along

5 said edge and slidable along the strip within the limits of the respective meshes and each comprising a loop portion embracing the respective strip and a coupling tongue projecting from the loop portion longitudinally of the strip, and a plurality of coupling loops borne by the strip along the opposite longitudinal edge of the panel at different meshes along said edge, and slidable along the second-mentioned strip within the limits of the respective second-mentioned meshes and each loop embracing the strip bearing it and formed to embrace also a coupling tongue, similar to the first-mentioned tongue, upon a companion panel, for releasably coupling the panel defined to a plurality of companion panels to form therewith a continuous grating.

8. A traffic-bearing sectional grating comprising a grating panel including a fixed strip along an edge thereof, a companion grating panel in edgewise opposition to said edge of the first panel to form therewith a continuous grating and including a fixed strip along its edge opposed to the first panel, a coupling and panel-spacing member carried by the said strip of the first mentioned panel and anchored to the first mentioned strip against removal therefrom and having a coupling tongue extending longitudinally of the first mentioned strip, and a coupling slide borne by said strip of said companion panel and connected to the latter strip against transverse separation therefrom and engaging said tongue and holding the two panels against separation, said slide being slidable along the strip to which it is secured for engagement with and disengagement from said coupling tongue to couple and uncouple the panels and the said coupling tongue lying between the two said strips of the two connected panels.

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