

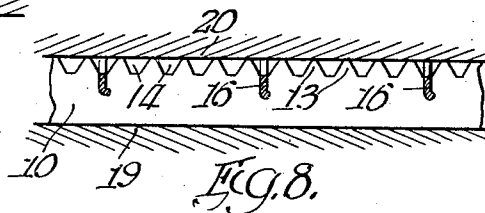
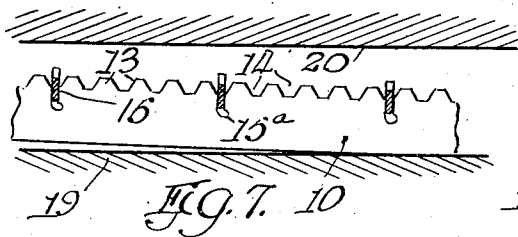
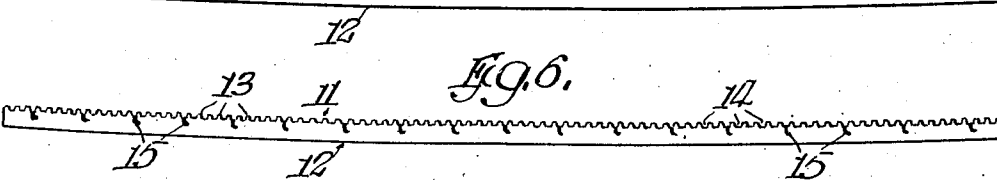
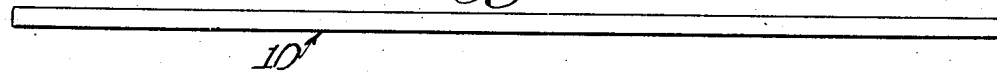
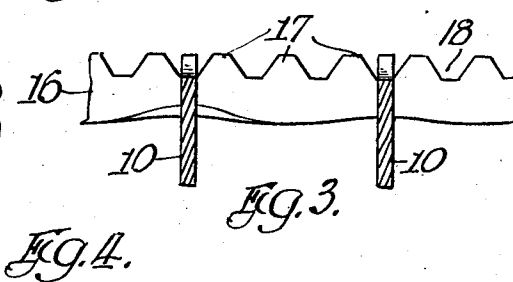
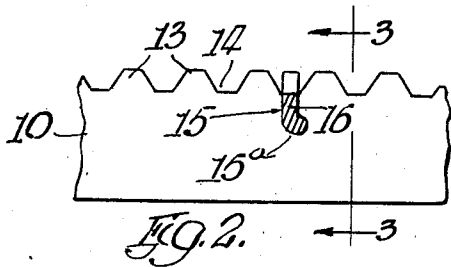
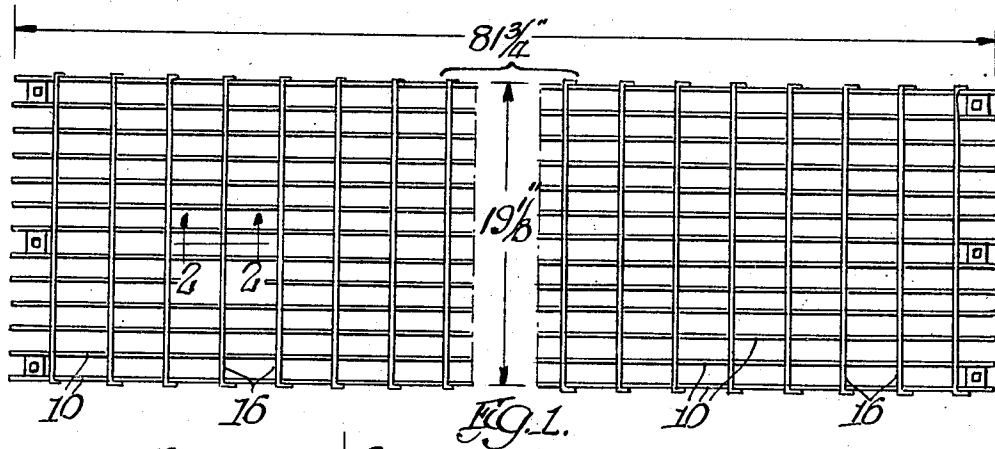
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2,423,896

METHOD OF MAKING METALLIC GRATINGS

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## UNITED STATES PATENT OFFICE

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## METHOD OF MAKING METALLIC GRATINGS

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2 Claims. (Cl. 29—160)

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This invention relates to improvements in metallic gratings and methods of making the same and it consists of the matters hereinafter described and more particularly pointed out in the appended claims.

The grating with which the present invention is more especially concerned is one made up from a set of parallel, edgewise disposed, girder bars and a set of parallel, edgewise disposed, cross bars which are pressed into slots or recesses in the edges of the girder bars. The slots in the girder bars open at one end through one edge thereof and at their other ends are somewhat curved longitudinally of the bars. When the cross bars, which are made of a softer metal, are pressed into the slots or recesses in the girder bars, the entering margins thereof are deflected into the curved parts of said slots or recesses so as to lock the cross bars to the girder bars. Such gratings are extensively used as running boards and brake steps for railway cars. As an example of such a grating, attention is directed to the Nagin Patent 1,693,399 and which grating is known to the trade as "Tri-Lok Grating."

In such gratings, when used as sections of a running board, the girder bars are approximately 80 to 90 inches long, one inch wide and one-eighth of an inch thick. The slots in one margin of the bars are of such depth as to extend about halfway therethrough and are one-eighth of an inch wide and are spaced about three and one-half inches apart.

Heretofore in producing such slotted or recesses girder bars, a straight bar having approximately the dimensions above set forth, was placed in a press and punched along one margin to form the recesses therein. When the grating was integrated by pressing the cross bars into the slots of the relatively long girder bars, each section of the grating assumed a longitudinal upward camber, due to the opening action of recesses in the girder bars. In punching the relatively long straight bars to form the girder bars with the recesses therein, the tension in the punched margin is in many cases released but is retained in the unpunched margin which draws the bar into an upwardly arched camber. This camber manifests itself in the finished grating to such an extent that in some instances the grating requires a straightening or flattening thereof after assembly, by means of special equipment. This, of course, increased the cost.

One of the objects of the present invention is to provide a grating of the kind mentioned, which is so constructed as to require no straightening or

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flattening operation after the assembly of the girder and cross bars.

A further object of the invention is to provide an improved method of producing the grating which eliminates the necessity of substantial straightening or flattening operation after assembly of the girder and cross bars and whereby a better grating is produced at a lower cost.

The above mentioned objects of the invention, as well as others, together with the several advantages thereof will more fully appear as the specification proceeds.

In the drawing:

Fig. 1 is a top plan view of a grating section, made in accordance with the invention for use in a running board for a railway car, overall dimensions being shown thereon for a better understanding of the size of said grating section.

Fig. 2 is a longitudinal vertical detail sectional view through a part of the grating, on full size scale, as taken on the line 2—2 of Fig. 1.

Fig. 3 is a transverse vertical detail sectional view through a part of the grating, also on a full size scale, as taken on the line 3—3 of Fig. 2.

Fig. 4 is a view in side elevation, on a materially reduced scale of a length of bar stock from which one of the girder bars of the grating is made.

Fig. 5 is a view in side elevation of the length of bar stock shown in Fig. 4 after it has been cambered edgewise by rolling or other suitable means.

Fig. 6 is a view of the cambered length of bar stock of Fig. 5 after it has been operated upon to produce in one margin thereof, alternate antislip tread projections and gullets and cross bar receiving recesses, each of which opens at one end through a gullet.

Fig. 7 is a fragmentary view showing manner in which the cross bars of the grating are initially disposed in the associated recesses in the girder bars and before such bars are subjected to an integrating or assembly pressure.

Fig. 8 is a view similar to Fig. 4 after said bars have been subjected to said integrating or assembly pressure and illustrates the cross bars as pressed into operative position in the recesses of the girder bars and which have been reformed into a straight condition.

In producing the grating section appearing in Fig. 1, I first provide a plurality of straight bars 10—10, one of which appears in Fig. 3, in some practical applications such bars are quite long approximating 82 inches. While various metals may be used, steel is quite satisfactory and may

be one inch wide and three-eighths of an inch thick. Such bars are then operated upon by rolling or other suitable means to camber the same edgewise as appears in Fig. 4 so as to have a top concaved edge 11 and a bottom convexed edge 12. In a bar of the length mentioned, the concaved edge will have a "dip" of from  $\frac{1}{2}$  to  $\frac{3}{4}$  of an inch at the middle of said bar.

After the bars have been cambered edgewise they are operated upon in a press (not shown) to punch in the concaved edge thereof a plurality of alternate projections 13 and intermediate gullets 14, as well as a plurality of substantially J shaped recesses 15. Each recess is preferably about  $\frac{1}{8}$  of an inch wide. The other or curved end 15a of each recess terminates at the longitudinal medial line of the bar.

The cross bars of the grating are indicated at 16. In one practical application they are about twenty inches long by one-half inch wide by one-eighth of an inch thick when made of steel. The upper margin of each bar is preferably punched to provide longitudinally spaced projections 17 and intermediate gullets 18 as appears in Fig. 3. The projections 13—13 of the girder bars and the projections 17—17 of the cross bars provide an antislip tread surface for the grating.

In making a grating section, such as shown in Fig. 1, a plurality of the girder bars 10—10 is disposed in a suitable holding means, on the flat bed 19 (see Figs. 7 and 8) of a press, in a laterally spaced relation approximating an inch and one-half apart with their concaved edges uppermost. When said bars are so arranged in the holding means, the recesses 15—15 in said bars 10—10 are disposed in straight rows transversely of said bars.

A cross bar 16 is then placed with its unserrated edge in the recesses 15—15 in each row, after which the said bars are simultaneously forced into said slots by means of a flat pressure head 20 of the press before mentioned. In this pressing operation the bottom margins of the cross bars are deflected into the curved parts 15a of the recesses 15 in the girder bars and which are simultaneously reshaped to a straightened condition so that the resulting grating is substantially flat and even and does not require a further substantial straightening operation after assembly.

While in describing the invention I have referred in detail to the form, arrangement and construction of the parts involved as well as to certain steps in the method of making the grat-

ing, the same is to be considered only in the illustrative sense so that I do not wish to be limited thereto except as may be specifically set forth in the appended claims.

I claim as my invention:

1. The method of making a metallic grating comprising girder bars and cross bars and which method consists in providing a plurality of girder bars cambered edgewise so as to have opposed concaved and convexed edges extending substantially the entire length thereof, forming longitudinally spaced recesses in the concaved margins of said bars and which open through the edge of said margins, arranging said bars in laterally spaced relation so as to dispose the recesses therein in transverse rows and pressing cross bars, one into each row of recesses from the open end thereof and simultaneously straightening said girder bars.

2. The method of making a metallic grating comprising girder bars and cross bars and which method consists in providing a plurality of girder bars cambered edgewise so as to have opposed concaved and convexed edges extending substantially the entire length thereof, forming longitudinally spaced recesses in the concaved margin of said bars with one end of said recesses opening through the concaved edge and with the other end of said recesses terminating short of the convexed edge and directed longitudinally of the bars, arranging said bars in laterally spaced relation with the convexed edges thereof engaged on a flat surface so as to dispose the recesses therein in transverse rows, arranging one margin of a cross bar in said open end of each row of recesses in said girder bars, and applying pressure from opposite sides of the assembly thus produced to force said margin of said cross bars into said recesses with a pressure sufficient to deflect parts of each cross bar into said other ends of the recesses and simultaneously therewith straightening said girder bars.

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