April 2, 1963 E. T. LORIG 3,083,620

OPEN FLOOR GRATING

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FIG. 1

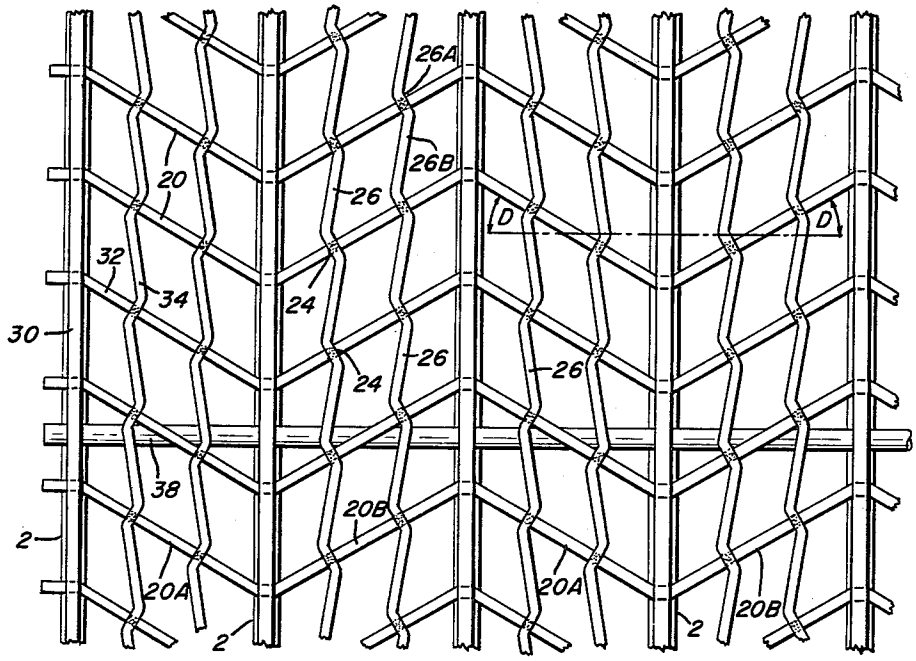


FIG. 2

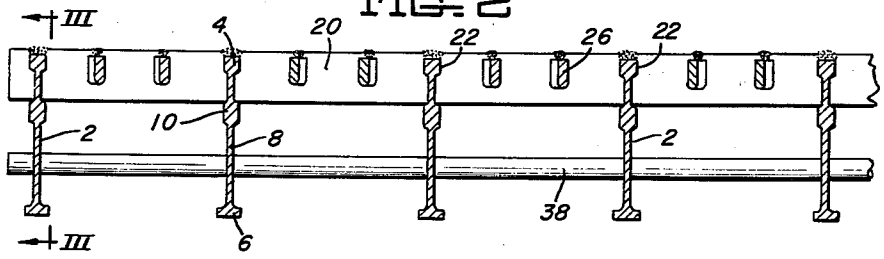
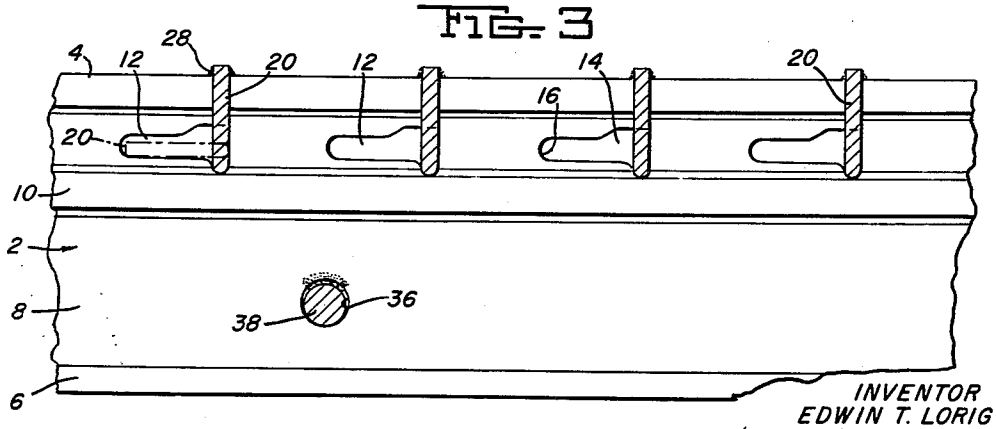


FIG. 3



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FIG. 4.

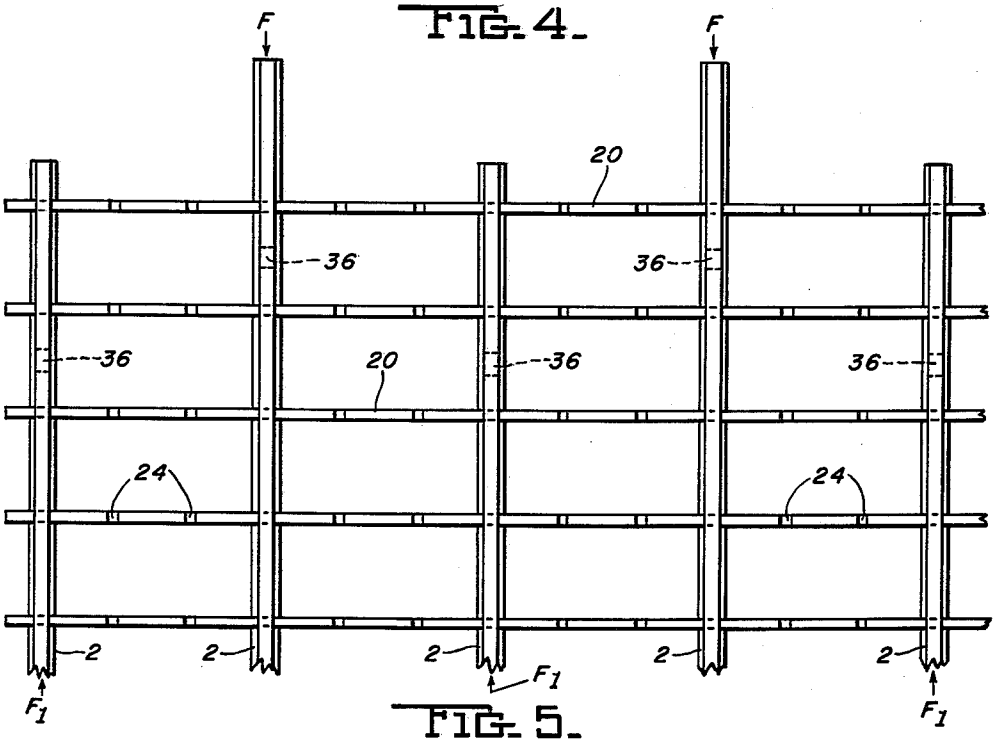
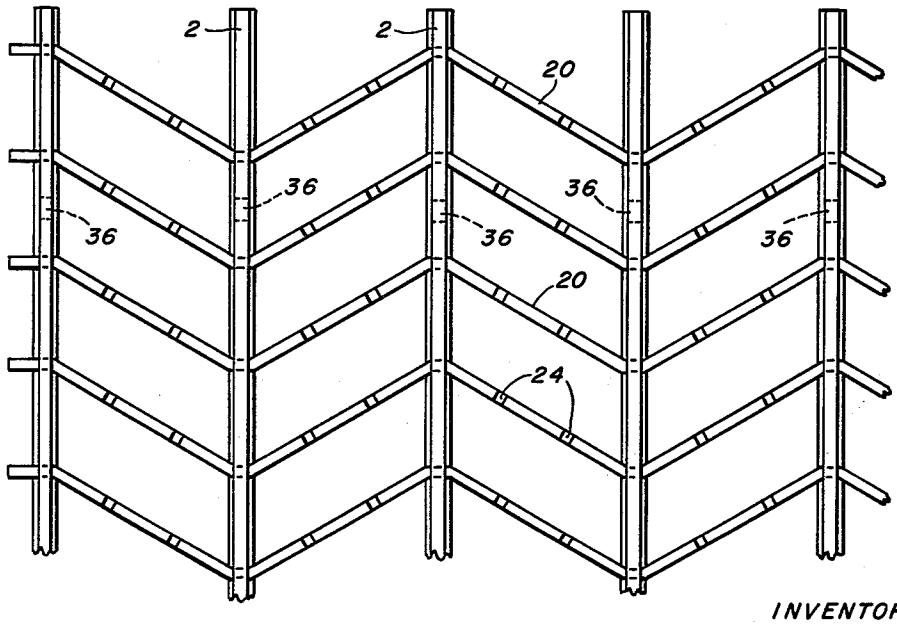


FIG. 5.



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OPEN FLOOR GRATING

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3 Claims. (Cl. 94—30)

This invention relates to open floor gratings, particularly gratings used on bridge roadbeds, and is a continuation-in-part of my copending application, Serial No. 526,233, filed August 3, 1955, and now abandoned. Gratings now in general use are constructed in such a manner that automobiles or vehicles passing thereover must do so at a relatively low speed to avoid accidents. Even at relatively low speeds automobiles tend to jump around as they pass over the open floor grating with resultant danger of skidding.

It is therefore an object of my invention to provide an open floor grating over which automobiles and other vehicular traffic can pass at relatively high speeds without danger of skidding, or loss of control due to bouncing.

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

FIGURE 1 is a fragmentary plan view of the preferred embodiment of my invention;

FIGURE 2 is a fragmentary end elevation of the device of FIGURE 1;

FIGURE 3 is a sectional view on the line III—III of FIGURE 2;

FIGURE 4 is a plan view showing an intermediate step in the fabrication of the grating of FIGURE 1; and

FIGURE 5 is a plan view, similar to that of FIGURE 4, showing a further step in the manufacture of the grating.

Referring more particularly to the drawings, reference numeral 2 indicates the primary members of the grating. Each of the primary members is provided with a head 4, a foot 6 and connecting web 8. An enlargement or rib 10 is provided on the web 8 below the head 4. A plurality of slots 12 are arranged in the web 8 immediately below the head 4. The slots 12 may be formed as shown in the patents to Greulich No. 2,275,104 and 2,275,105, dated March 3, 1942. However, it is preferred to make the slots generally T-shaped as shown with their longest portions or legs extending along the axis of the web and the short legs 14 extending vertically. The corners of the slots 12 are rounded at 16. Secondary members or bars 20, which are substantially rectangular in cross section, are provided with spaced apart recesses 22 on their upper edges which are adapted to receive the heads 4 of the primary member 2. The secondary members 20 are provided with spaced apart notches 24 for receiving tertiary bars or members 26. The construction so far described is essentially as shown in the above identified Greulich patents. However, my improved grating construction differs from that of the Greulich patents in several important respects. The secondary bars 20 are arranged in a zig-zag fashion as best shown in FIGURE 1 with the portions 20A extending in one direction and adjacent portions 20B extending in the opposite direction. For best operation portions 20A and 20B are preferably arranged at an angle D of between approximately 20 and 30° to the direction of the traffic which is indicated by the arrows A of FIGURE 1. However, angle D may be between 15 and 45°. When angle D is less than 15° there will be excessive side sway of an auto passing thereover and when greater than 45° the auto, especially the rear wheels, will bounce excessively and the welds in the grating will be subject to excessive strain. The traffic will also be noisy under this latter condition. Tertiary bars 26 instead of being straight are preferably sinuous with portions 26A adjacent the bars 20 being perpendicular to the bars 20 and the portions

26A being connected by straight portions 26B. The grating is preferably constructed in the following manner. A plurality of primary bars 2 are arranged in spaced apart relationship with their apertures 12 in alignment. At least three and preferably more of such bars are necessary in each grating section. Straight secondary bars 20 are inserted in the openings 12 in the manner described in the above mentioned Greulich patents. Alternate bars 2 extend beyond the other bars as shown in FIGURE 4. Forces F are then applied simultaneously to the alternate primary members 2 of the assembly as shown in FIGURE 4 in order to move alternate primary members longitudinally with respect to the remaining primary members. At the same time forces F_1 may be applied to the remaining primary members in the direction opposite forces F. This movement bends secondary bars 20 and moves the ends of the primary bars 2 into alignment with one another as shown in FIGURE 5. The tertiary members 26 are then placed in notches 24 and the assembly welded together at the intersections of the bars. Welds 28 may extend above the surface of the grating. It will be seen that this grating is made up of a plurality of generally rectangular bars arranged on edge and welded together to form a plurality of traffic supporting surfaces 30, 32 and 34, with all these surfaces being arranged at an angle of at least 20° to the direction of traffic. The surfaces 30, 32 and 34 are in substantially the same plane, that is, they may be in exactly the same plane or some of the surfaces may be slightly above the other surfaces as is common practice in the construction of open floor gratings. However, by far the best results are obtained when the surfaces 32 are a slight distance (approximately 3/32 to 1/4 of an inch) above the surfaces 30 and 34. The width of the traffic supporting surfaces should be less than one-fourth the width of the tires of vehicles passing thereover and for best results this width should be about 5% of the width of the tires. It will be understood that truck tires are much wider than ordinary automobile tires and that this relationship does not relate to trucks but to automobiles. While the tertiary bars 26 may be straight it is preferred to have them sinuous as shown in order to give resiliency to the grating. It is absolutely necessary that the grating be arranged with respect to the direction of traffic in the manner shown. The reason for this is that there should be no traffic supporting surface parallel to or closely parallel to the direction of traffic movement.

Openings 36 may be provided in that portion of the web 8 below the bottom of the secondary and tertiary member with the apertures being spaced in such a manner that they will be in alignment after the alternate primary members have been moved to the position shown in FIGURE 5. Tie bars 38 can then be inserted through aligned openings 36 and welded in place.

While one embodiment of my invention has been shown and described it will be apparent that other adaptations and modifications may be made without departing from the scope of the following claims.

I claim:

1. An open floor grating for supporting vehicular traffic comprising a plurality of spaced generally parallel primary bars extending transversely of the direction of travel of traffic, said primary bars having spaced apertures therein, a plurality of spaced substantially parallel secondary bars, said secondary bars extending between said primary bars through said apertures in a zig-zag fashion and being arranged at an angle of between approximately 20 and 30° to the direction of traffic, said secondary bars having spaced notches in their upper surfaces, and a plurality of tertiary bars arranged in said notches, said tertiary bars being arranged in non-parallel relationship with said primary bars, the tops of said secondary bars being a slight distance above the tops of the

primary and tertiary bars and the width of the top of the bars being less than one-quarter of the width of the tires of automobiles passing thereover, all of the load supporting surfaces of said grating being disposed at an angle to the direction of travel of said traffic and the majority of said surfaces being arranged at a non-perpendicular angle to the direction of travel of said traffic, said bars forming a plurality of openings having a plurality of different shapes.

2. An open floor grating for supporting vehicular traffic comprising a plurality of spaced generally parallel primary bars extending transversely of the direction of travel of traffic, said primary bars having a substantially I-shaped cross section and provided with longitudinally extending thickened portions in spaced relationship with respect to their head and foot portions, the web portion of said bars of I-shaped cross section having a plurality of spaced apertures extending into said thickened portion, a plurality of spaced substantially parallel secondary bars, said secondary bars extending between said primary bars through said apertures in a zig-zag fashion and being arranged at an angle of between approximately 20 and 30° to the direction of traffic, said secondary bars having their upper longitudinal edges notched to conform substantially to the section of the head portions of said primary bars, said secondary bars being provided with a plurality of spaced notches extending downwardly from the upper edges thereof, and a plurality of sinuous bars arranged in said notches, all of the load supporting surfaces of said grating being disposed at an angle to the direction of travel of said traffic and the majority of said surfaces being arranged at a non-perpendicular angle to the direction of travel of said traffic, said bars forming a plurality of openings having a plurality of different shapes.

3. An open floor grating for supporting vehicular traffic comprising a plurality of spaced generally parallel bars extending transversely of the direction of travel of traffic, a plurality of spaced substantially parallel secondary bars extending between said primary bars at an angle of between 15 and 45° to the direction of traffic, and tertiary bars extending between and fastened to said secondary bars between said primary bars in non-parallel relationship with said primary bars, the tops of said bars being in substantially the same horizontal plane, all of the load supporting surfaces of said grating being disposed at an angle to the direction of travel of said traffic and the majority of said surfaces being arranged at a non-perpendicular angle to the direction of travel of said traffic, said bars forming a plurality of openings having a plurality of different shapes.

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