Dec. 4, 1945. E. L. TAROF 2,390.194

GRATING

Filed Oct. 27, 1944 2 Sheets-Sheet 1

Fig. 1

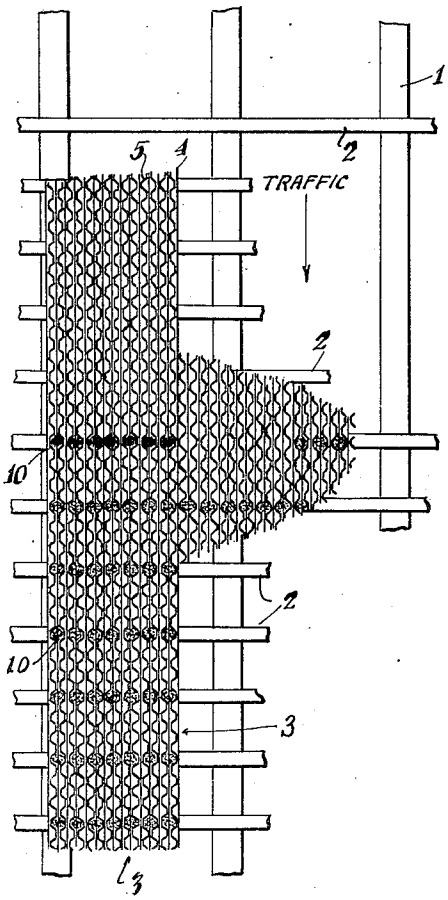


Fig. 2

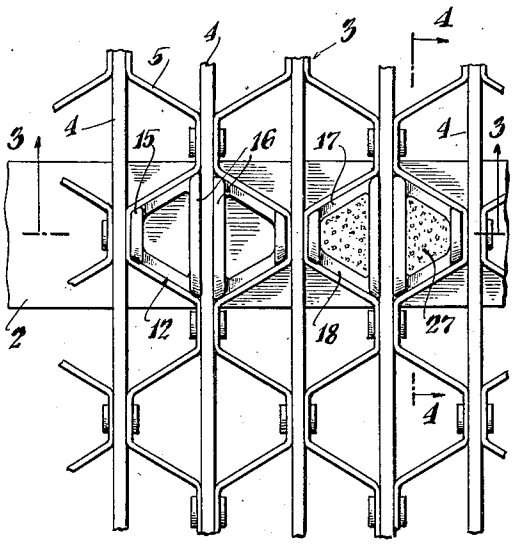


Fig. 3

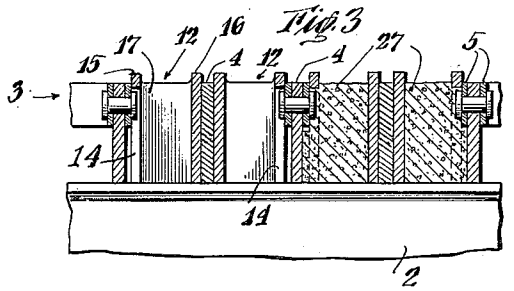
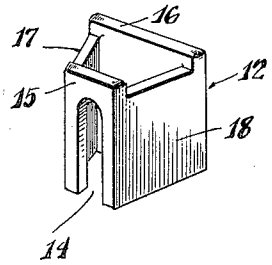


Fig. 5



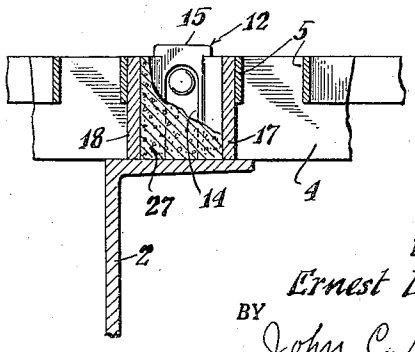


Fig. 4

INVENTOR.
Ernest L. Tarof
BY
John C. Kerr
ATTORNEY

Dec. 4, 1945. E. L. TAROF 2,390,194

GRATING

Filed Oct. 27, 1944 2 Sheets-Sheet 2

Fig. 6

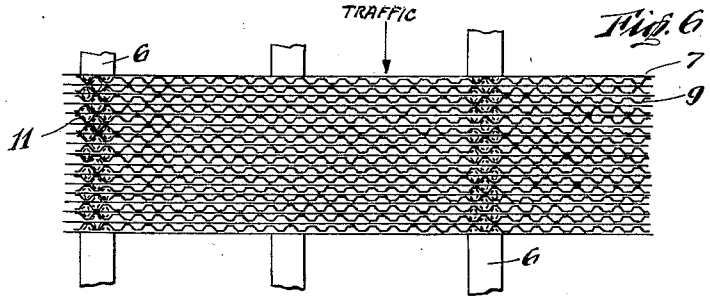


Fig. 7

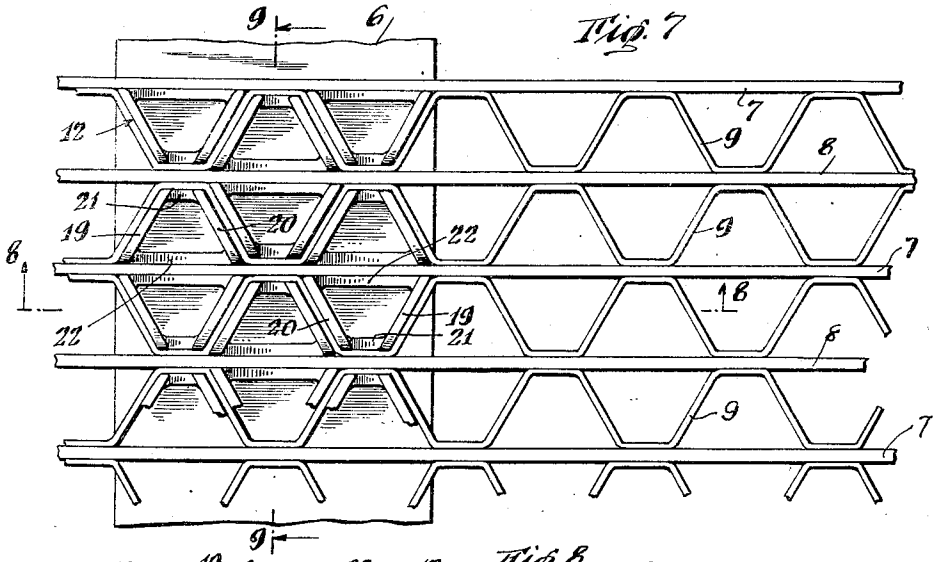


Fig. 8

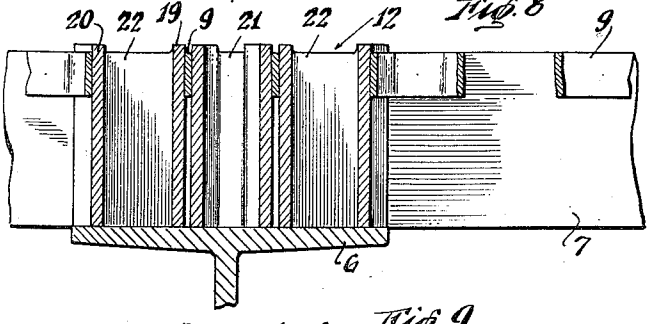


Fig. 10

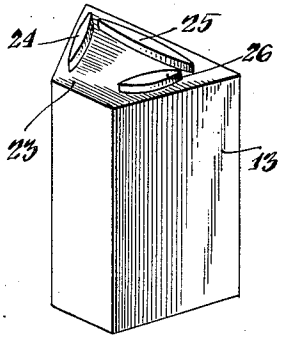
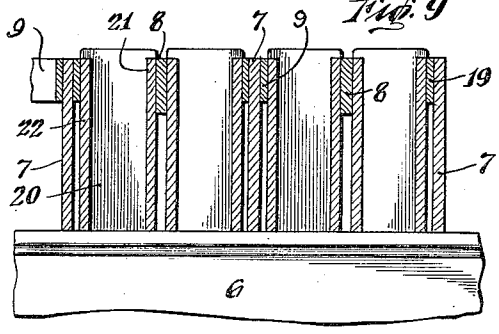


Fig. 9



INVENTOR.
Ernest L. Tarof
BY John C. Kerr
ATTORNEY

Patented Dec. 4, 1945

2,390,194

UNITED STATES PATENT OFFICE

2,390,194

GRATING

Ernest L. Tarof, Cupsaw Lake, N. J., assignor to Kerlow Steel Flooring Company, Jersey City, N. J., a corporation of New Jersey

Application October 27, 1944, Serial No. 560,556

5 Claims. (Cl. 94—30)

This invention relates to gratings and to devices used in conjunction with gratings for restraining the skidding of vehicles over the surface of a grating roadway.

Open mesh floor grating is used extensively for new and reconstructed bridges. Sections of grating are assembled side by side and to end to form a continuous flooring. It is common to have all of the strips or bars of a roadway grating reach the upper surface of the grating in a common plane. The characteristics of gratings are such that their longitudinal strips or bearing bars are placed either crosswise of a bridge or along the length of a bridge, and although gratings differ in design, they provide in their surfaces other strips or crimped strips having at least some portions which extend laterally to the main bearing bars so that in whatsoever direction a grating is laid there is a substantial number of upper edge surfaces extending both laterally and longitudinally of the direction of vehicular travel. The result is that for any type of grating used as a roadway or bridge flooring skidding may occur if brakes are applied suddenly, particularly when the grating is worn from use and ice has collected on the upper edge surfaces of the strips of the grating. It is among the objects of this invention to provide means for restraining skidding over a roadway grating.

The present invention contemplates the interruption of the otherwise level surface of flooring which is formed by the upper edge surfaces of the strips of the grating by providing devices in some of the open meshes of the grating and in such relation to each other as to afford restraint against skidding. The devices are in the form of individual inserts which project above the upper edge surfaces of the strips of the grating and effect dissipation of energy of a moving vehicle by contacting its sliding wheels and causing their repeated rising as the vehicle skids against successive obstructions or groups of obstructions.

The inserts may be placed in different locations on different types of grating structures and bridge constructions, but in the main, inserts or groups of inserts are used at intervals which will provide repeated obstruction to the sliding of a vehicular tire. By this I mean that the groups of inserts are so spaced that the bearing area of a vehicular tire will not include more than one group of projections at a time so that when a car is skidding it will encounter a series of obstructions during the skid, each of which will be effective to exert independent restraining influence on further skidding.

Grating is supported on sills running crosswise of a bridge and sometimes it is supported on stringers running lengthwise of the bridge. These supporting elements constitute a skeleton supporting structure which closes off a clear view through the grating immediately above the supporting elements, i. e., sills or stringers, as the case may be. While the inserts may be constructed and arranged to engage within any of the meshes of a grating, it is convenient to so construct the inserts that they may rest upon the structural elements which support the grating and underlie the meshes in which the inserts are retained. It will be appreciated that when supporting sills are spaced, say, 15 or more inches apart, the lines of meshes which are blocked out by sills immediately therebelow are spaced conveniently for locating the inserts along the sills. The same is true with respect to grating supported over stringers which run lengthwise of the roadway, even though these stringers may be spaced some 30, 40 or 50 inches apart. In addition to this spacing, either lengthwise of the roadway or crosswise of the roadway, depending upon the kind and arrangement of the elements constituting the skeleton supporting structure for the grating, the inserts may be located in groups spaced longitudinally of the sills or of the stringers, as the case may be.

Referring to the drawings:

Fig. 1 shows a plan of a portion of a roadway having a grating extending lengthwise of the roadway and employing my invention;

Fig. 2 is an enlargement of a section of the plan illustrated in Fig. 1;

Fig. 3 is a section on line 3—3 of Fig. 2;

Fig. 4 is a section on line 4—4 of Fig. 2;

Fig. 5 is a perspective view of an individual insert;

Fig. 6 shows a plan of a portion of a roadway having a grating extending crosswise of the roadway and employing my invention;

Fig. 7 is a small section of grating showing an optional form of insert;

Fig. 8 is a section on line 8—8 of Fig. 7;

Fig. 9 is a section on line 9—9 of Fig. 7;

Fig. 10 is a perspective view of another form of insert.

In Fig. 1 I have shown a skeleton supporting structure for a roadway in which the stringers 1 run parallel to the direction of traffic and sills 2 are provided for supporting the grating 3 which constitutes the surface of the roadway. This grating is composed of straight strips or bearing bars 4 separated by crimped strips 5. The straight strips and the crimped strips are held

together at points of contact by rivets. The strips of the grating are held together with sufficient rigidity to form a unitary structure to present an open mesh surface serving as a roadway for vehicular traffic. All of the upper edge surfaces of the strips lie in one plane, but the crimped strips need be only partially as deep as the straight strips, Figs. 3 and 4. In constructing the roadway, sections or panels of assembled straight strips and crimped strips are laid in place over the supporting sills 2 and are joined to one another so as to form a continuous grating.

The grating shown in Figs. 6, 7, 8 and 9 is laid directly upon stringers 6. It includes straight strips 7 and 8, and bent strips 9 which are rigidly held together by welding at surfaces of contact. In this arrangement the traffic travels transverse the strips of the grating. The gratings illustrated are conventional and it will be understood that the present invention is suitable for use in conjunction with other forms of grating having different patterns.

A series of inserts may be placed immediately above the sills, as indicated at 10 in Fig. 1, or if the grating is laid transverse to and directly upon the stringers, the inserts may be used in the meshes which overlie the stringers, as shown at 11 in Fig. 6.

Each insert is preferably made in such a form as to provide a close fit within the horizontal open area of a mesh. It may consist, for example, of strip metal or cast metal opening upwardly and downwardly and having the pattern of the mesh, as illustrated at 12, Fig. 5, and in Figs. 2, 3, 7, 8 and 9, or it may consist of an integral casting of metal 13, Fig. 10, likewise having the horizontal pattern of the mesh. Other forms are self-evident from the attainments effected. Preferably, the inserts have a depth sufficient to extend from just above the upper edge surfaces of the strips of the grating down to the lower surface of the grating or to the top of the flange of the supporting structural element on which the grating rests, as shown in Figs. 3, 4, 8 and 9, but they may be supported by the rivet heads. When the strips of the grating are held together by rivets, each insert is provided with a notch 14, Fig. 5, so as to accommodate the head of a rivet when the insert is slipped into place. For use in conjunction with the conventional type of grating illustrated in the drawings, each insert has a trapezoidal shape in plan. For grating having a rectangular mesh the inserts are rectangular to fit the meshes.

For providing the obstructing characteristics desired, any number of the four side walls can be made to extend above the plane of the upper edges of the strips of the grating for about one-quarter of an inch, more or less. In Figs. 2, 3, 4 and 5, the parallel walls 15 and 16 are higher than the remaining walls 17 and 18. The upstanding projections of the parallel walls afford restraint to skidding sidewise over a roadway structure such as shown in Fig. 1. In Figs. 7, 8 and 9 the angularly disposed walls 19 and 20 are higher than the parallel walls 21 and 22 as they are more effective to restrain sidewise slipping over the roadway shown in Fig. 6.

The insert shown in Fig. 10 constitutes a metal casting in the form of an inverted receptacle having a top wall 23. The top surface of this wall 23 lies in the plane of the upper edge surfaces of the grating and it is provided with nibs or other projections, such as 24, 25 and 26 upstanding above the surface of the grating. It will be appreciated that an insert of this character fills the area of a mesh in which it is contained.

The hollow inserts shown in Fig. 5 may, if desired, be filled with concrete or other filling material sufficiently to cover the open area of the insert, as illustrated at 27, Figs. 2, 3 and 4, but preferably, the concrete is so placed as to leave uncovered the upwardly-projecting metal edges of the insert. The concrete or other filling material may be placed after the insert is placed, particularly if the insert is located over a supporting element which can serve to sustain the filling material.

A covered insert, such as illustrated in Fig. 10, or a filled insert, such as illustrated in Figs. 2, 3 and 4, has the advantage that it will exclude the collection of snow or ice in those portions of the grating where the inserts are used. The use of solid inserts immediately above the supporting elements of the flooring will have the effect of preventing the collection of dirt in the meshes which would otherwise constitute a menace leading to the deterioration of the structure due to the encouragement of rusting of the steel members by moisture and collected dirt.

The amount of metal provided by the inserts which projects above the upper edge surfaces of the strips of the grating may be variable in amount and in the projecting height. When worn or broken the affected inserts may be replaced. With inserts located over the supporting elements for the grating, there will be sufficient spacing of the projecting obstructions to avoid the wheels of a vehicle running over the obstructions instead of over the main surface of the grating. The inserts may be used in individual meshes separated from one another or in separated groups of meshes so as to provide a series of obstructions to skidding. It has been observed that motorists have the tendency to apply their brakes at certain places on a bridge. Upon discovering where these places are on a particular bridge, inserts may be placed where they will be most useful.

What is claimed is:

1. In a grating structure for a vehicular roadway comprising a plurality of metal strips arranged on edge with their upper edge surfaces all lying in one and the same plane, said strips being held together at points of contact and with sufficient rigidity to form a unitary structure presenting an open mesh surface serving as a roadway for vehicular traffic, a skeleton supporting structure including structural elements underlying and supporting said grating at intervals, and means for providing obstruction to skidding over said roadway, said means comprising a plurality of individual devices, each device being engaged at its sides by the sides of said metal strips defining a mesh in said grating structure and said devices providing projections above the upper edge surfaces of said strips, said devices being located in groups of multiple devices separated from one another and thereby providing separated areas of obstructions in the surface of said grating.

2. In a grating structure for a vehicular roadway comprising a plurality of metal strips arranged on edge with their upper edge surfaces all lying in one and the same plane, said strips being held together at points of contact and with sufficient rigidity to form a unitary structure presenting an open mesh surface serving as a roadway for vehicular traffic, a skeleton

supporting structure including structural elements underlying and supporting said grating at intervals and means for providing obstruction to skidding over said roadway, said means comprising a plurality of individual devices arranged in groups spaced from one another and over said supporting structural elements of the skeleton supporting structure, said devices being of such size as to fit within the meshes of said grating and extend from said skeleton supporting structure to above the upper edge surfaces of the strips of said grating.

3. In a grating structure for a vehicular roadway comprising a plurality of metal strips arranged on edge with their upper surfaces all lying in one and the same plane, said strips being held together at points of contact and with sufficient rigidity to form a unitary structure presenting an open mesh surface serving as a roadway for vehicular traffic, a skeleton supporting structure including structural elements underlying and supporting said grating at intervals, and a plurality of individual devices located in certain of the meshes of said grating, each of said devices being in the form of a metal frame opening upwardly and downwardly and having side walls so disposed as to contact with the side walls of a mesh formed by the metallic strips of said grating, and the side walls of said device having such depth as to extend from the lower edges of the metal strips of said grating structure to just above the upper edges of the metal strips of said grating structure so as to provide projections above the surface of the roadway.

4. The grating structure defined in claim 3 in which the hollow space defined by the side walls of said devices are filled with concrete up to about the surface of the roadway.

5. In a grating structure for a vehicular roadway comprising a plurality of metal strips arranged on edge with their upper surfaces all lying in one and the same plane, said strips being held together at points of contact and with sufficient rigidity to form a unitary structure presenting an open mesh surface serving as a roadway for vehicular traffic, a skeleton supporting structure including structural elements underlying and supporting said grating at intervals, and a plurality of individual devices located in certain of the meshes of said grating, each device comprising a metal casting in the form of an inverted receptacle having side walls disposed parallel to the sides of the metal strips defining a mesh in said grating structure, said receptacle having such depth as to rest upon a structural element underlying the grating structure and to extend upwardly at least in part to slightly above the upper edge surfaces of the metal strips of the grating.

ERNEST L. TAROF.