April 17, 1956 E. C. LISKEY, JR 2,742,121

METALLIC GRATING

Filed March 31, 1952 2 Sheets-Sheet 1

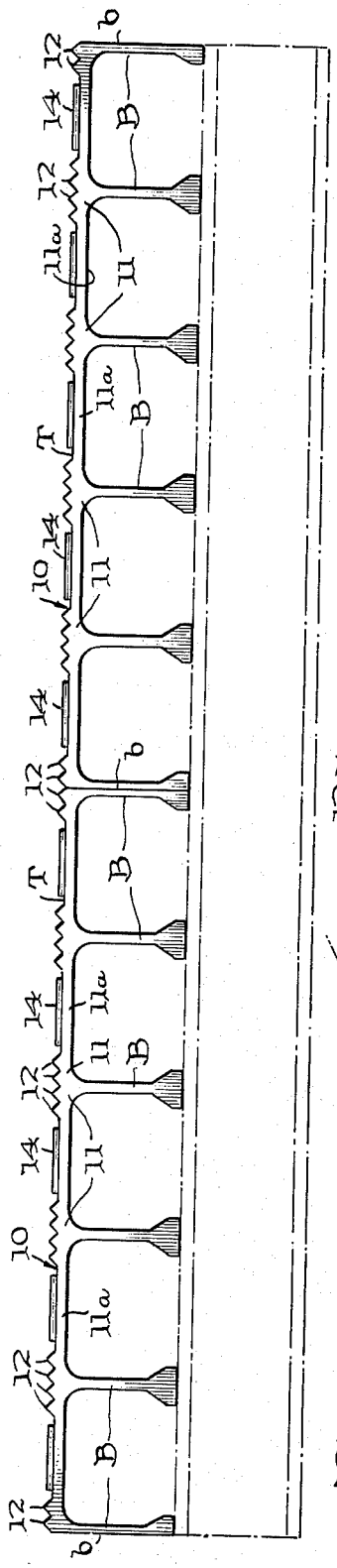


FIG. 2.

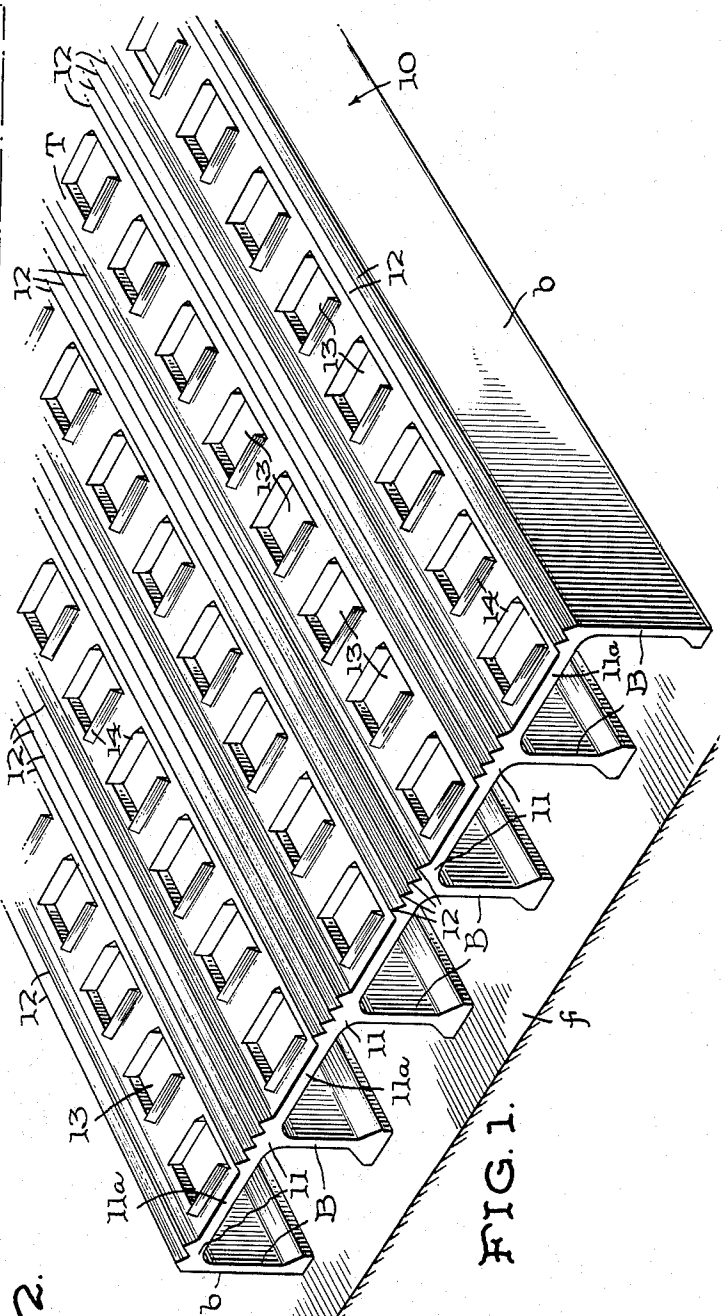


FIG. 1.

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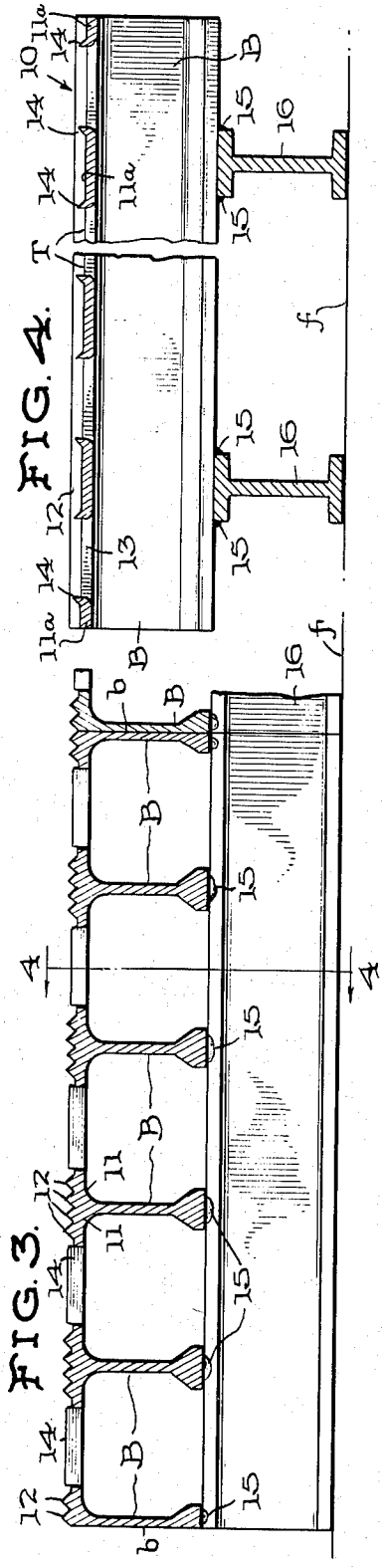


FIG. 3.

FIG. 4.

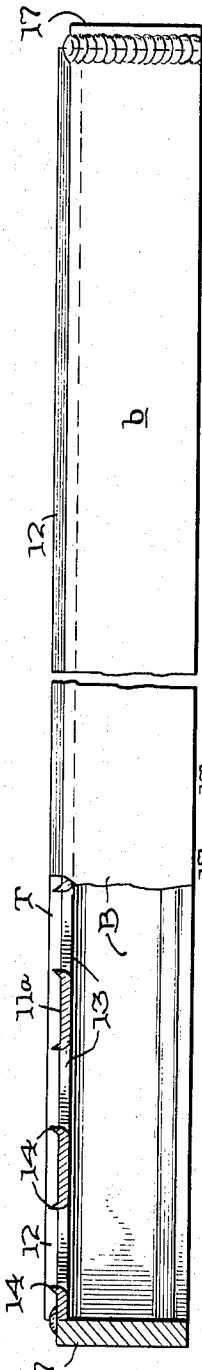


FIG. 5.

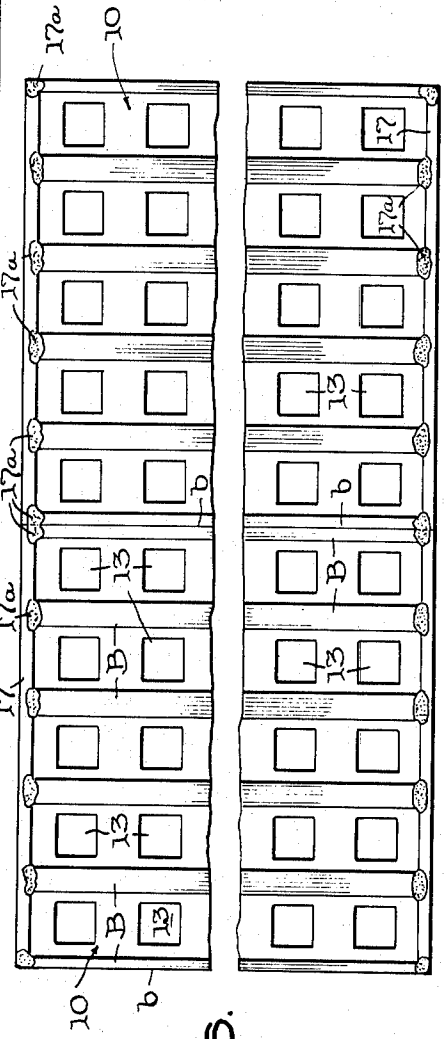


FIG. 6.

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METALLIC GRATING

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Application March 31, 1952, Serial No. 279,526

1 Claim. (Cl. 189—83)

The present invention relates to an improvement in metal grating for walks, floors, runways, cat-walks, decks and the like in order to provide a supporting surface while permitting the free passage of light, air or liquids therethrough and thereunder.

Heretofore, such metal grating has been constructed in various forms, usually from a ferrous metal, and produced in various ways, the earliest having been heavy iron castings and, later, being formed by a rolling process and by fabricating bent or stamped strip-metal. Gratings, that will withstand relatively heavy loads and that will be durable and safe in use, are of the type that comprise spaced parallel bearing bars which support a perforated platform or tread surface which is roughened to provide an anti-slip surface. Proposals have been made to provide such gratings, or sections thereof, by metal rolling, but have resulted in a more expensive product or in a product which has not gained favor among the users thereof. These gratings, under various conditions of use, have become warped or uneven or cracked due to stresses and strains commonly caused by varying heats employed during their fabrication and are not uniform in strength, this latter being particularly true with one proposal to roll or extrude a grating section to produce a platform with depending parallel bars and then slitting and expanding the tread-surface between the bearing bars, after the manner of expanded lathing.

I have found that I can produce a grating having greater uniform strength, greater lasting properties and maximum efficiency in load distribution by extruding aluminum into an integral rigid mass defining a plurality of elongated substantially equi-spaced and coextensive parallel I-beams arranged in the same plane, the upper flanges of which being extended laterally to form connecting webs, which, together with the said flanges, provide a rigid tread portion or platform of the grating section or unit. Usually, a grating section, so formed, is about six inches in width and the beams are about one inch apart, one beam being disposed, respectively, at and along the longitudinal edge of each section and the remainder being distributed equally between said side beams. The outer surfaces of said side beams are flat and normal to the longitudinal edges of the platform to form a finished face so that such faces of two or more sections may be placed in contiguous abutting relation and welded together to produce a grating of greater width; or the sections may remain unsecured so as to be individually removable while, at the same time, providing a neat close-joint at their point of contact. The extruding of the metal to form the grating section also permits the formation, at the same time, of raised longitudinal ridges on the upper surface of the platform or tread portion to provide anti-skid elements and the rigid web portions of the tread portions between the beams may be cut-out, by stamping or punching, to provide openings to permit the egress of air, light or liquids; and, in cutting out these ventilating areas in the tread portion of the section, certain of the edges may be, at the same time, upset in a fashion to provide additional anti-skid elements as well as to provide reinforcing ribs transversely of the tread-area between said spaced beams.

It is the object of my invention to overcome the drawbacks of the prior art and to attain the advantages of a grating having the features just enumerated.

The grating of the present invention is particularly useful for industrial flooring or marine decking, is extremely light in weight, is low in manufacture and in maintenance costs, provides a maximum of ventilation, is free of unnecessary cracks and crevices permitting easier cleaning and greater sanitation, is non-sparking and, consequently, is efficient in use in power plants, chemical plants, oil refineries, sewage disposal plants, on ship-board (such as tanker cat-walks, for engine, pump and storage decks and bridging) and in water works, and cold storage plants—in all of which uses ferrous metals deteriorate and oxidize quickly.

In order that the invention may be more specifically understood, reference is made to the accompanying drawings, which illustrate the invention as at present devised, and wherein:

Figure 1 is a fragmentary perspective view of a grating section constructed in accordance with the present invention;

Figure 2 is an end elevation illustrating two grating sections in juxta-position and adapted to be supported upon underlying cross beams, shown in dot-and-dash lines;

Figure 3 is a fragmentary transverse sectional view illustrating two or more grating sections in contiguous position and welded to underlying cross beams in order to elevate the grating sections, such as when it is desired to admit a maximum passage of liquid or a refrigerating air under the grating;

Figure 4 is a vertical sectional view taken substantially on line 4—4 of Fig. 3;

Figure 5 is a side elevation of a grating section with parts broken away to illustrate details of construction and relation of parts and showing end plates welded to the end of beams; and

Figure 6 is a bottom or under view of two grating sections in juxta-position and having their ends closed by end plates.

With the specific reference to Fig. 1 of the drawings, the grating section **10** is formed by extruding aluminum through a suitable die (not shown), that will give form to the extruded metal mass in the shape illustrated, and comprises a plurality of substantially equi-spaced and parallel I-beam members B arranged in the same horizontal plane, the flange portions **11** of said beams, at one cross-sectional end thereof, being extended laterally to join the extended flange portions of adjacent beams to form a connecting web **11a** therebetween and, thus, a tread surface T for the grating section. Two of said beams are disposed at the longitudinal sides of the grating section and have their outer surface *b* in a smooth vertical plane normal to longitudinal edge of the tread surface so that surfaces *b* of two or more grating sections **10** may be brought in close contiguous contact. The extruding die is so formed that, when the metal is extruded therethrough, a plurality of groups of spaced raised ridges **12** (preferably inverted V-shaped) is formed on the upper surface of the tread portion T, there being one group of such ridges overlying each I-beam area and extending longitudinally thereof and leaving a plane flat area **11a** between adjacent ridged areas **12**, said flat area of the tread portion and the web portions of the I-beams being substantially of the same thickness.

After the section **10** has been so extruded, it is then subjected to a stamp-cutting operation to remove metal

from each of said flat areas of the tread portion to provide in each of said areas the series of openings **13**; and, when so stamp-cutting said openings, the edges **14** of the latter are upset laterally to produce upwardly inclined ribs or ridges, with a relatively sharp edge of the height substantially that of the ridges **12**, and extending at substantially right angles to the longitudinal ridges **12**. The ridges **14** have a two-fold purpose of providing anti-skid elements and, also, of reinforcing the flat tread areas. The openings **13** may vary in size or shape according to the particular requirements of use of the grating—that is, they may be more elongated than illustrated and may be staggered.

The dimensions of the grating section and its component parts may be varied depending upon the load weight it is designed to carry, but, as a general indication of proportions, it may be pointed out a section 3 feet long and 12 inches wide, with the I-beams spaced one inch apart and one inch in depth, will support a weight of 294 lbs. per square foot. The length and width of the grating sections and the depth of the beams **11** and their spacing may be varied according to engineering calculations to provide requisite strength requirements for the grating for any given use.

As shown in Figures 3 and 4 the bottoms of the beams B of a grating section **10** may have welded thereto, as at **15**, underlying spaced cross-beams **16** so as to elevate the grating above a supporting surface or floor *f*, when it is desired to provide an increased lower area for the passage of a large volume of liquid or to permit the maximum circulation of a refrigerated air and the like.

As shown in Figures 5 and 6 the grating section or sections **10** may each be closed by a plate-strip **17** extended across the exposed ends of the beams B and welded thereto as at **17a**. The end plates **17** will complement the side-surfaces *b* in framing-in the section **10** and provide an additional reinforcement to the gratings.

The grating of this invention has the advantages of providing an extruded grating unit (1) having a rigid tread surface integral with the heads of a plurality of underlying spaced bearing supporting I-beams, free of internal stresses and strains, (2) having accurately pre-formed longitudinally arranged non-skid ribs and grooves, (3) having a plurality of die-cut grating openings in the rigid tread-surfaces between said beams and formed with upset ridge-edges that reinforce the area between the beams

and provide non-skid elements, (4) that may be used in side-by-side closing contacting sections, either welded together or in unsecured relation; (5) that has a maximum of smooth exposed surfaces to prevent collection of dirt, grease and unsanitary waste; and (6) that is a much cheaper grating to manufacture for its strength and durability.

Having thus described my invention and the manner in which the same is to be made and used, it is apparent that the invention can be modified or varied from the exact form above illustrated and described, so long as said variations fall within the scope of the appended claim.

What is claimed, as new, is:

In an integral metallic single piece grating for use as flooring, decking, pavement inserts and the like, a plate-like member having one face thereof providing a tread surface formed with a plurality of spaced substantially parallel groups of inverted V-shaped ridges extending from one edge thereof to its opposite edge and the top edges of said ridges terminating in the same horizontal plane above said thread surface, the areas of said tread surface between said groups of ridges each having a series of spaced polygonal openings therethrough with certain side edges of each opening forming upwardly projecting inverted V-shaped ribs extending angularly with respect to said ridges and having their ends spaced from the sides of the adjacent ridges to allow drainage through said openings, the top edges of said ribs lying approximately, at least, in the same plane as the top edges of said ridges, and spaced supporting members projecting from the underside of said plate and underlying said groups of ridges and substantially coextensive therewith.

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