

- [54] **GRATINGS**
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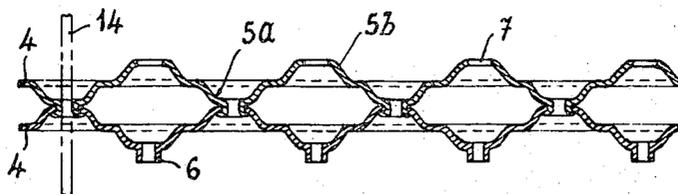
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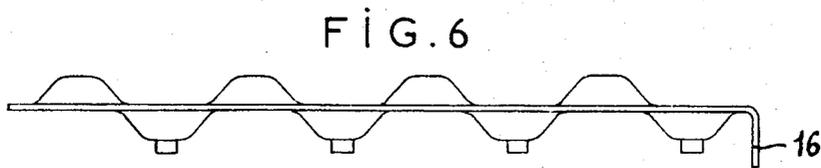
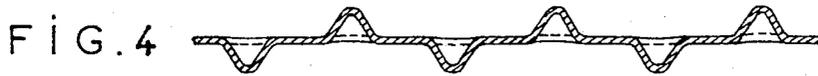
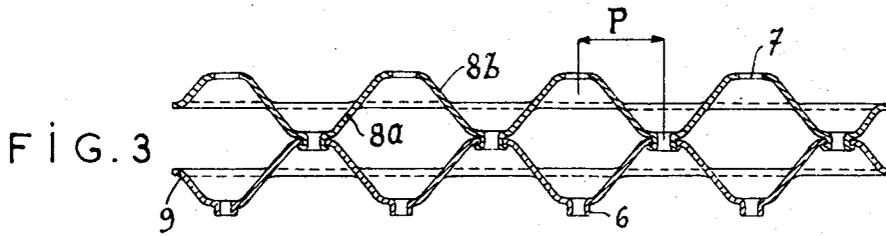
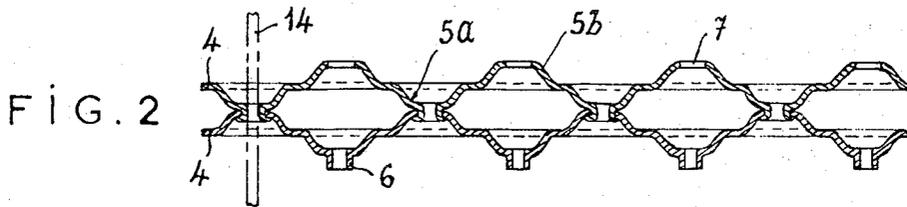
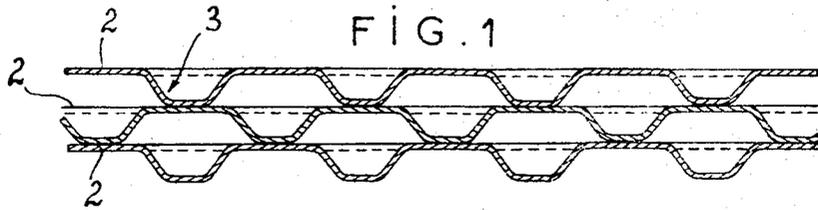
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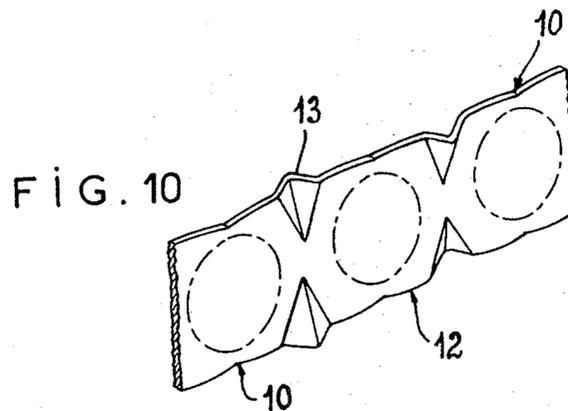
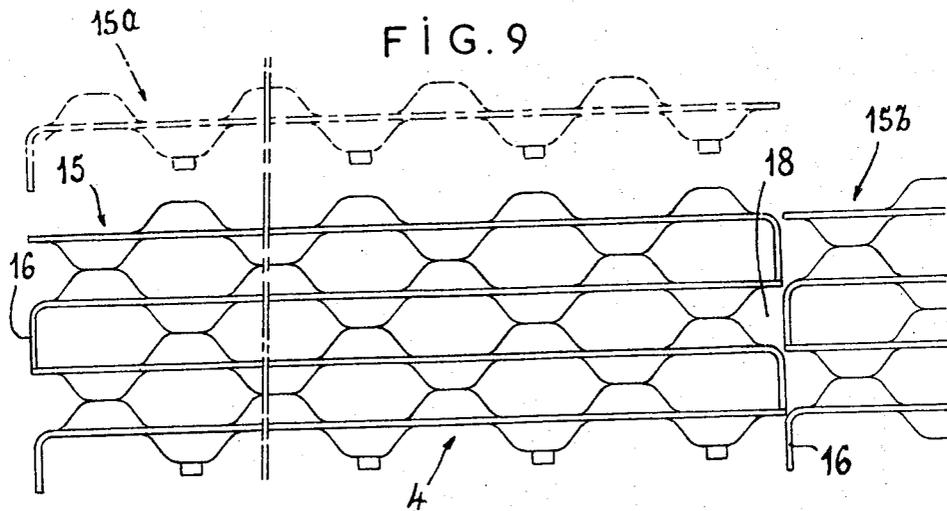
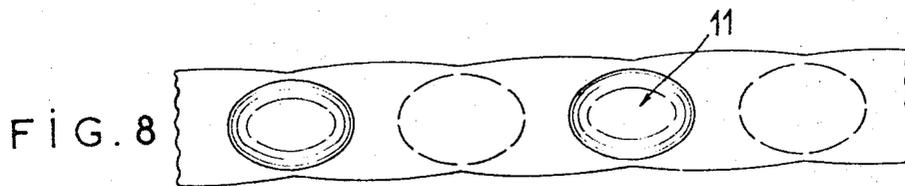
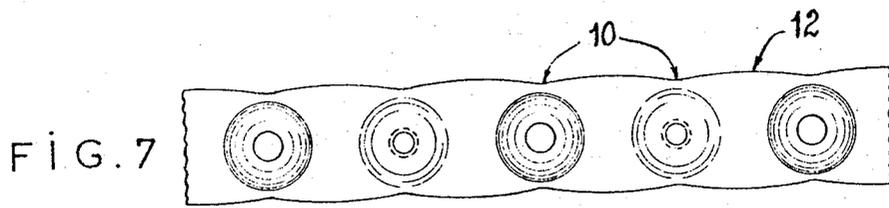
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[57] **ABSTRACT**
 This simplified and economical grating structure comprises flat parallel elongated sections or bars disposed on edge and braced by means of bosses pressed directly in said sections and projecting from at least one lateral face of each section. The sections are assembled, by welding, setting or otherwise, by causing the apices of registering bosses to contact one another; elongated bosses may also be used, and V-shaped notches may be pressed in the edges of the sections for constituting anti-skid elements; a plurality of grating elements may be assembled and secured to one another by juxtaposition, the sections being formed in this case with a bent end portion engaging a gap in the adjacent section. Preferably, the pitch and shape of the alternating bosses are such that the bosses form together a sinusoidal section through the grating element

2 Claims, 10 Drawing Figures







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GRATINGS

FIELD OF THE INVENTION

The present invention relates in general to gratings. 5

In certain constructions, and notably in workshops comprising several levels or storeys, pressed or stamped metal gratings are commonly used for flooring purposes. 10

REFERENCE TO THE PRIOR ART

As a rule, these gratings comprise a metal frame structure having secured to its edges a plurality of cross members crossing each other to constitute a rigid assembly of which the upper, flat and perforated surface constituted by the edges of the members lying in a plane which forms the floor proper. 15

Gratings of this general type are objectionable on account of their considerable weight per unit surface area. 20

SUMMARY OF THE INVENTION

It is the essential object of the present invention to provide a grating structure the construction of which is both simplified and more economical, with a weight per unit surface area approximating that of perforated sheet metal elements. 25

The grating structure according to the present invention is characterised in that it comprises flat parallel sections, disposed on edge, braced by pressed bosses projecting from at least one of their lateral faces. 30

Thus, the use of cross members for stiffening the gratings in the transverse direction may be dispensed with. 35

According to a typical form of embodiment of this invention, the grating structure consists of sections in which bosses are pressed or stamped so as to project alternatively on one and the other lateral faces of the sections, said sections being so disposed that the bosses formed on the lateral faces of two adjacent sections engage one another at their apices. 40

With this arrangement the number of sections necessary for the grating construction may be reduced by one-half, the grating weight being reduced accordingly. 45

Of course, the plurality or section constituting the gratings may be assembled through any known means but preferably by welding or setting at all or part of their mutual contact points. 50

If each section comprises bosses projecting alternately from one and the other lateral faces thereof, the bosses projecting from one face are formed with a central hole at their apex, and those projecting from the opposite face comprise tubular tenons adapted to be fitted into the holes of the adjacent bosses engaged thereby, to permit the subsequent setting or the two adjacent sections. 55

Of course, the relative position of the bosses formed on each section determines the grating pattern which may be of any desired type. However, in order to derive the maximum advantage from the increment in general strength resulting from the presence of the bosses on each section, and especially to reduce the section thickness and consequently the weight of the gratings, the pitch and shape of these bosses are calculated with 60

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a view to cause these alternating bosses to form sinusoidal patterns with one another (in cross section).

On the other hand, it may be noted that an improved strength may be imparted to the sections by using elongated bosses having its major dimension disposed parallel to the section length.

Finally, according to a complementary feature of this invention and with a view to minimize the risk of slipping on the sections in the longitudinal direction thereof, the waves or corrugations resulting from the recesses formed along the upper and lower edges or each section at the level of the vertical median plane of each boss and resulting from the stamping or pressing of these bosses are not eliminated but on the contrary accentuated, in order to constitute anti-skid elements. 15

Moreover, in order further to improve the mutual anchoring of said bosses in the longitudinal direction of the sections, and also in the other directions, each section comprises in the gap formed between any pair of adjacent bosses and at the level of its upper and lower edges, respectively, substantially V-shaped pressed portions or notches projecting alternately from one and the other side of the section and differently from one gap to another the free edges or said pressed portions or notches constituting likewise efficient non-skid elements in the general grating structure. 20

BRIEF DESCRIPTION OF THE DRAWING

FIGS. 1, 2 and 3 are fragmentary plan views from above and in cross section showing three embodiments of the grating structure of this invention; 25

FIGS. 4, 5 and 6 are plan views from above showing three sections adapted to be used in the manufacture of said gratings; 30

FIG. 7 is a side elevational view showing more particularly the projections and constructions formed in each section during the pressing or stamping of said bosses; 35

FIG. 8 is a side elevational view showing a modified embodiment of the section shown in FIG. 7; 40

FIG. 9 is a plan elevational view from above showing the possibilities of assembling one element of said gratings with other juxtaposed elements, and 45

FIG. 10 is a perspective view showing diagrammatically another of a section suitable for carrying out this invention. 50

SPECIFIC DESCRIPTION

The gratings according to the present invention comprise essentially flat parallel sections braced by means of bosses formed by stamping or pressing therein and projecting from at least one of their lateral faces. 55

In the embodiment illustrated in FIG. 1 each section 2 comprises pressed bosses 3 and the sections are assembled for example by welding all or part of the points of mutual contact to one another. It may be noted that said sections 2 are off-set laterally so that each boss 3 of one section is fixed to the web formed between a pair of adjacent bosses of the adjacent section. 60

In a modified embodiment shown in FIG. 2 each section 4 comprises aligned bosses 5a, 5b projecting turns alternately from one and the other face of the section. Moreover, to permit the assembling of the various sections 4 by setting, each boss 5a comprises at its apex a tenon 6 adapted to penetrate into the hole 7 formed through the apex of the boss 5b of the adjacent section 4 during the assembling operation. 65

Of course, it is not necessary to have all the bosses of one section firmly connected to the corresponding bosses of the adjacent section.

It may be noted that the fact of forming said bosses on either side of each section permits of doubling its lateral dimension and therefore of reducing by one-half the number of sections necessary for constituting a grating structure.

It is known that forming pressed areas in a flat section will improve its rigidity while reducing the possibility of warping same. Therefore, the presence of bosses 5a and 5b on the above-mentioned sections 4 will reduce the thickness of this section 4 without impairing its rigidity and mechanical strength. For further reducing the thickness of this section and therefore the weight per surface unit of the grating, it is advantageous to form the bosses with a relative pitch p such that the alternate bosses 8a, 8b of a same section 9 will form together, when seen in plan view from above and as shown notably in FIG. 3, a regular sinusoid.

Of course, the distribution of said bosses on each section, as well as the particular shape of these bosses, may vary assume the configurations illustrated in FIGS. 4 to 6, as a function of the section material and the desired grating pattern. Moreover, each boss may have a generally circular shape as shown in FIG. 7 or, in contrast thereto, an elongated shape, i.e. an elliptic cross-sectional shape 11 with the major axis of the ellipse parallel or substantially parallel to the longitudinal axis of the section, as shown in FIG. 8.

When pressing or stamping the bosses 5a, 5b, recessed portions 10, visible more particularly in FIG. 7, are formed at the level or the vertical median plane of each boss and along the upper and lower edges of the section, to constitute waves or corrugations 12 along each section edge.

According to a specific feature characterising this invention, the waves or corrugations 12, which would normally be removed, are on the contrary accentuated in order to constitute non-skid elements counteracting any tendency of the user to slip in the longitudinal direction of the sections.

In fact, when a person is walking on a grating structure according to the present invention, his shoe soles must engage some retaining or anti-skid elements preventing him from skidding, irrespective of the direction in which said person may walk with respect to the main longitudinal axes of the gratings.

According to a specific form of embodiment of this invention and with a view to further improve the engagement of shoe soles with the gratings, each section thereof comprises as shown in FIG. 10 spaced and substantially V-shaped pressed notches 13 of which the free edges act as non-skid elements. These notches 13 project alternately on one and the other side of each section 2 and to a different degree from one gap to another. It may be noted that the useful or operative edges of each notch 13 are formed on top of each section 2, as shown at 12, so that they are particularly capable of acting as non-skid elements.

Generally, the various sections are assembled by welding or setting, but it is also possible to complete the grating structure, if necessary, with transverse rods 14 as shown more particularly in FIG. 2. These rods disposed at right angles to the sections 4 or otherwise extend through these sections by using to this end the bore formed to this end in the tubular tenons 6 of

bosses 5a. Of course, these rods are provided only at proper relative intervals, for example every three or four bosses.

Although the sections constituting the gratings may have any desired length it is obvious that transporting the gratings to the construction site makes it necessary to manufacture them in the form of separate elements adapted to be stacked and subsequently assembled. Thus, while the juxtaposition of an element 15 as illustrated in FIG. 8 with another element such as 15a is a relatively simple matter due to the presence of tenons 6 engageable into the holes 7 of the registering bosses, the assembling of the same element 15 with an element such as 15b is not so simple.

To this end, the present invention provides on each section 4 an elbow or bent lug 16 at one of its free ends and when assembling the sections 4 these are properly disposed so that one elbow 16 projects alternatively from the right-hand of left-hand side of the longitudinal edges or the gratings. Thus, the gap between two adjacent sections 4 is closed on one side by an elbow 16 but comprises on the other side an opening 18.

Thus, when the grating element 15b is juxtaposed to element 15, the elbows or lugs of the former engage the opening 18 of the latter, and vice versa, thus ensuring the proper relative positioning of these two elements.

As will be clearly apparent from the above description, the present invention should not be construed as being strictly limited to the specific embodiments described and illustrated herein, since various modifications and variations may be brought thereto without departing from the spirit and scope of the invention as set forth in the appended claims.

What I claim as new is:

1. A grating adapted to constitute a floor surface, said grating comprising a multiplicity of substantially coextensive mutually parallel transversely spaced elongated flat grating elements disposed on edge and having generally coplanar upper and lower edges with their upper edges constituting said floor surface, said elements each being of a width between its upper and lower edges substantially less than the element length; and a row of bosses of generally round configuration unitarily pressed in each of said elements and tapering in alternate directions transversely toward an adjacent element while being secured thereto at apices of said bosses, said bosses being of a width less than that of the respective element, the bosses of each element extending in one direction being secured to the bosses of an adjacent element extending in the opposite direction, the bosses along one side of each element being formed with tubular projections at their apices and the bosses along the opposite side of each element being formed with holes at their apices receiving the projections of an adjacent element.

2. A grating adapted to constitute a floor surface, said grating comprising a multiplicity of substantially coextensive mutually parallel transversely spaced elongated flat grating elements disposed on edge and having generally coplanar upper and lower edges with their upper edges constituting said floor surface, said elements each being of a width between its upper and lower edges substantially less than the element length; and a row of bosses unitarily pressed toward an adjacent element while being secured thereto at apices of said bosses, at least said upper edge of each of said elements being deformed laterally in opposite directions to produce V-shaped notches defining nonskid elements along said surface.

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