Jan. 16, 1940. R. E. LAUBSCHER 2,187,500

FLOOR CONSTRUCTION

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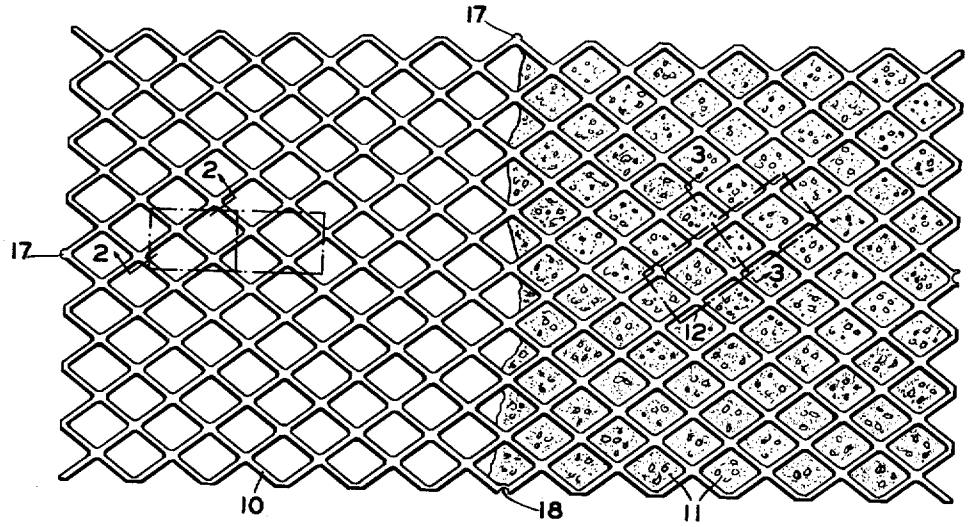


FIG.-1

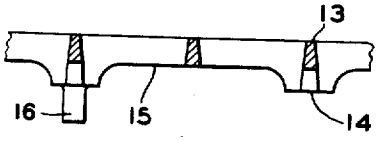


FIG.-2

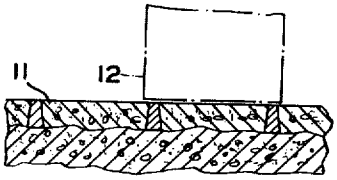


FIG.-3

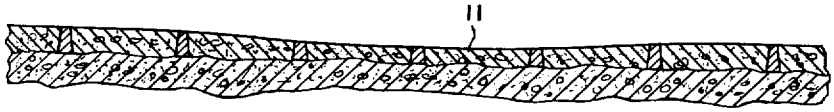


FIG.-4

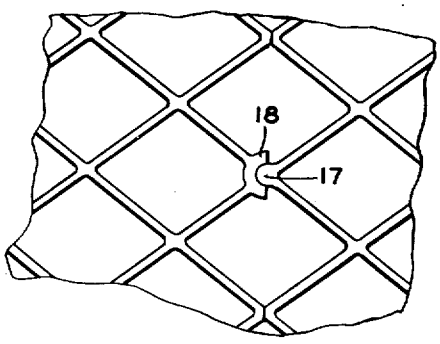


FIG.-5

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FLOOR CONSTRUCTION

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2 Claims. (Cl. 94—8)

This invention relates to improvements in floor construction of the type adapted to withstand hard usage over long periods of time, and more particularly is directed to such a floor construction adapted to wear evenly throughout its life.

The floor construction disclosed herein is of a composite type utilizing a hard grille providing a uniformly repeated pattern over the surface of the floor with the interstices of the pattern filled with a less hard composition, the grille and the filling composition being level with the surface of the floor and each contributing its part in resisting wear throughout the life of the floor.

One of the features of my improved floor construction is the provision of a composite floor comprised of a metallic grille and a filling composition as above described wherein the proportional area between the grille and the filling material is substantially in inverse ratio to their respective capacities for resisting abrasion and wear due to usage.

Another object of my invention is to provide floor construction for use with wheeled vehicles having hard tires with substantially flat treads wherein the clear span between adjacent elements of the grille is less than the width of the wheeled treads in any direction of wheel travel and wherein also the proportional area between the grille and the filling material is substantially in inverse ratio to their respective capacities for resisting wear so that during the life of the floor each portion thereof takes its share of the load so that they wear down evenly without any cupping of the filling material in the interstices between the elements of the grille.

Other objects of my invention are the provision of a novel grille providing a uniformly repeated small polygonal pattern over the entire surface of the floor wherein the metal is so disposed as to give the greatest wear resisting capacity with the lightest weight; the provision of a grille in easily handled and laid sections, together with means for easily and efficiently tying them together in the floor; the provision of a grille well adapted to bond itself in the filling composition; a grille easily adapted to be tied into a sub-floor construction; and a grille which is easily cast and easily filled with a plastic composition material. All these and further objects of the invention will be apparent from the accompanying drawing and description and the essential features will be summarized in the claims.

In the drawing, Fig. 1 is a view of a section of my improved grille adapted to set in a floor, the left half being shown unfilled and the right being shown filled with a composition material,—in dot-dash lines is shown the relative position of a wheel on the floor; Figs. 2 and 3 are enlarged sections along similarly numbered lines of Fig. 1; Fig. 4 is a sectional view through a floor equipped with my novel construction showing how wear occurs; while Fig. 5 is an enlarged plan view showing the manner of joining adjacent sections of the grille.

Under certain working conditions floors are subjected to such heavy wear and abrasion that the life thereof is very short, particularly where any cheap and reasonably laid floor is involved. Such conditions arise for instance in the wash room of a laundry handling heavy, wet articles in large quantities, wherein these articles are transported in wheeled vehicles having hard tires with a flat tread so that a very heavy load is concentrated on portions of the floor as the vehicle passes thereover. I have laid my improved floor, for instance, under such conditions in the wash room of a towel laundry where it has stood up under such heavy usage much better than prior known floors.

I am aware that I am not the first to utilize a metallic grille and a composition filling material therefor in floor construction but I have devised improvements therein which greatly increase the life of the floor while retaining the quality of evenly resisting wear over the entire surface.

To the accomplishing of the above described ends I utilize a grille 10 of a wear-resisting metal and preferably arranged in easily handled sections, such as 18 by 36 inches or 24 by 36 inches. A suitable metal for such a grille is cast iron with or without a little steel in it. Such a grille is cheaply constructed and provides a surface on the casting which easily bonds itself with the composition filling material. The grille is so arranged as to provide a uniformly repeated regular small pattern over the surface of the floor. Preferably such a pattern is a small polygon and more preferably a quadrilateral, such as the diamond shape shown herein. It will be understood, however, that I do not limit myself as to the shape of this pattern except as required by the prior art and defined in my claims.

The relationship between the area of the grille and the area of the composition filling material in the interstices thereof is substantially in inverse ratio to their respective capacities for resisting abrasion and wear under the conditions of usage. For instance if the grille is of cast iron and the composition filling material at 11 is of concrete or of a specially prepared hard asphalt having qualities similar to concrete, I find that the ratio between the wear-resisting qualities of these materials is approximately 6 or 7 to 1, the cast iron of course having the greater resistance. Therefore I arrange the composite floor so that the ratio between the area of iron to concrete or asphalt is of the order of 1 to 6 or 7. Then if the flooring is so arranged that all parts

receive the wear evenly distributed, the grille and the filling material will wear down evenly so that cupping is avoided. In Figs. 1 and 3 I have indicated in dot-dash lines at 12 a wheel having a hard tire and a substantially flat tread. It will be noted from the various views that the clear span between adjacent elements of the grille is less than the width of the wheel treads in any direction of wheel travel. Therefore every portion of the floor receives its share of the wear and the floor will wear down evenly over all portions thereof as shown in Fig. 4.

Referring now to the details of the grille construction, the diamond pattern of Fig. 1 is preferably about 1¾ inches to the side but may vary from this so that the area of one of the quadrilateral spaces varies from about 3 square inches to about 4½ square inches in various styles of grille. The thickness of the grille bar elements is preferably about ⅛ inch at the surface of the floor but may vary from $\frac{3}{32}$ to $\frac{5}{32}$ of an inch. Referring to Fig. 2, the grille shown varies from about ⅛ inch of bar thickness at the point 13 at the top to a thickness of about ¼ inch at the point 14 at the bottom, the full depth being approximately ¾ inch. Preferably each side of each diamond is cut out as shown at 15 for approximately half the depth of the bar, thus providing communicating passages between adjacent diamonds permitting an easier filling with the concrete or plastic material and providing a thicker body of filling material at these points and hence a more durable floor.

The progressively increasing thickness of the grille bars from 13 to 14 has several advantages. In the first place it provides sufficient draft so that the grille is easily cast and removed from the mold. In the second place, the grille is wedged in the filling composition of the finished floor so as to prevent a loosening or raising of the grille during usage, and in the third place as the grille wears down, indicated in the central portion of Fig. 4, the proportional area of the grille bars increases slightly so that the floor is increasingly resistant to wear during the life thereof.

If desired for purposes of bonding the floor to the sub-floor, projections such as those indicated at 16 in Fig. 2 may be provided. These are not for positioning the grille and therefore need not be of uniform length and other means may be provided if desired for tying the grille to the sub-floor.

Where a floor is made up of a plurality of sections it is desirable to tie adjacent sections together in case there is any tendency of the floor to rise or sink over portions thereof, or to insure that the sections move in unison during expansion and contraction thereof. To this end at least one point at each side of each floor section is provided with coacting tie portions for connection with adjacent sections. As shown in Fig. 1 the section there indicated is provided in the middle of one end and in the midle of one side with male portions 17 and in the middle of the other two sides with the female portions 18. When a floor is laid these portions coact as shown in Fig. 5 and tie adjacent sections together.

In laying a new flooring over an old floor, the surface of the floor is carefully cleaned and may be roughened if desired. Holes for the anchoring studs of the cast iron grilles (if such studs are used) are then drilled in the old floor at properly spaced intervals. Leveling pads of a sand and concrete mixture are placed upon the old floor beneath the grille sections to raise the latter and to level them. Concrete grouting is then applied to set the grilles. After this the concrete or asphalt, or other filling material, is placed in the interstices of the grille and a float machine is utilized to level the new flooring. The same procedure is followed in connection with the laying of new floors except that holes need not be drilled for the anchoring projections as these, if used, are merely embedded in the sub-floor material.

In laying my improved floor I may finish the same by a coating of the filling material over the entire surface of the floor to a depth of $\frac{1}{16}$ or $\frac{1}{32}$ of an inch over the top of the grille. This is only for the purpose of obtaining a little additional life for the floor although it will also insure a complete filling of all interstices between the elements of the grille. In such a case the unusual wear-resisting qualities of my floor do not come into play until this additional top coating is worn down, at which time the floor will attain the condition shown in Fig. 3.

The floor here disclosed has the filled spaces between the grille elements so arranged with respect to the vehicle traffic on the floor that there is practically no impact effect on the floor, but instead the action is almost purely one of abrasion. Under constant heavy use abrasive material is ground into all parts of the floor substantially uniformly and by proportioning the grille elements and filling material as herein taught, the full value of the component parts is realized and the floor possesses long and uniform wearing qualities.

What I claim is:

1. In floor construction, a grille providing a network of elements forming a uniformly repeated pattern, said elements at their upper edges terminating in a common plane, said elements being of substantially uniform thickness at and near said plane, filling material in the spaces of said pattern between said elements, said material being level with said plane of the grille, the areas of said grille and said filling material exposed at said plane being proportioned substantially in inverse ratio to the respective capacities of said grille and filling material for resisting abrasion and wear due to usage, and the area of the filled spaces between the elements of said pattern being such as to substantially avoid impact and to give only abrasive wear of said floor by vehicles using it, whereby said floor in use wears without cupping.

2. In floor construction, a cast iron grille providing a network of a uniformly repeated quadrilateral pattern wherein the area of the quadrilateral lies between three and four and one-half square inches, said grille comprising elements terminating at their upper edges in a common plane, said elements being of substantially uniform thickness between three thirty-seconds and five thirty-seconds of an inch at and near said plane, a hard concrete filling material in the quadrilateral spaces of said pattern between said elements, said material being level with said plane of the grille, the cast iron and concrete being of such composition that their respective capacities for resisting abrasion and wear due to usage are in inverse ratio to their areas exposed at said plane, whereby said floor will withstand heavy usage without cupping.

RALPH E. LAUBSCHER.