July 7, 1936. G. B. STORACE 2,047,119

ROAD AND LIKE PAVING

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Fig. 1

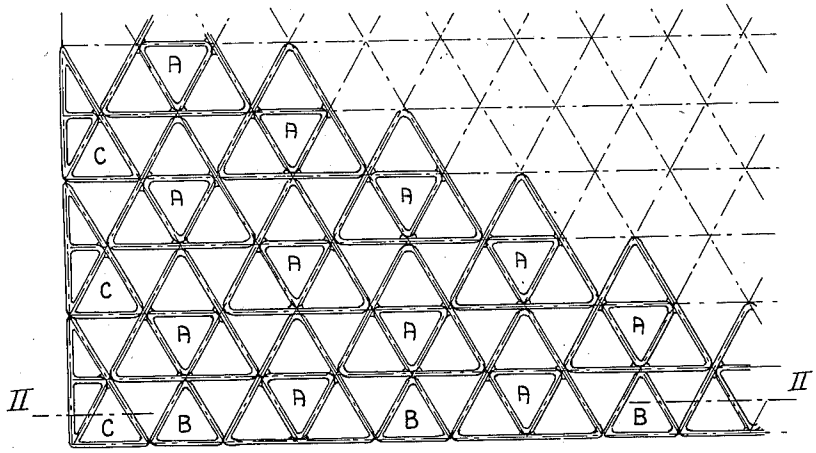


Fig. 2

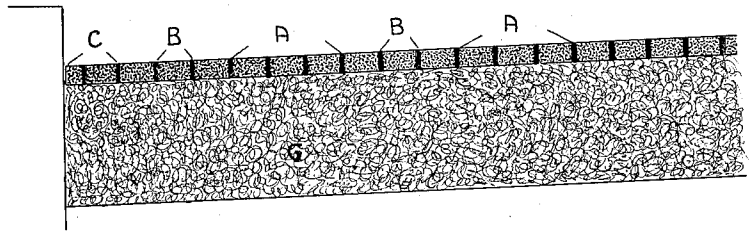


Fig. 3

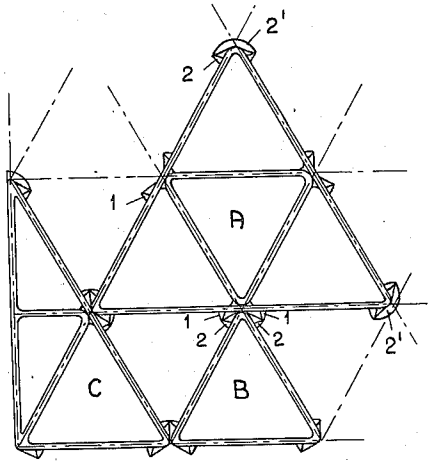


Fig. 4

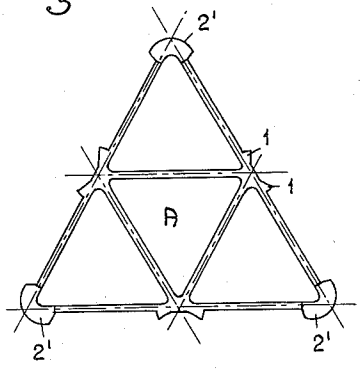
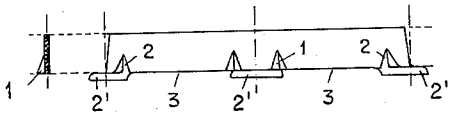


Fig. 5



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Fig. 6

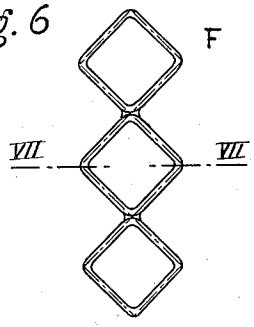


Fig. 7

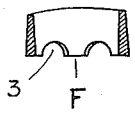


Fig. 8

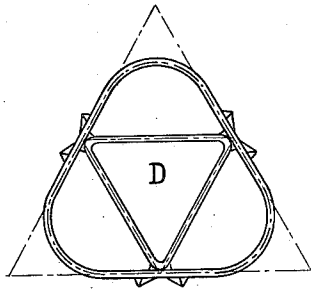


Fig. 9

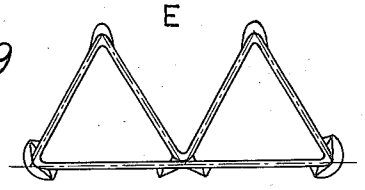


Fig. 10

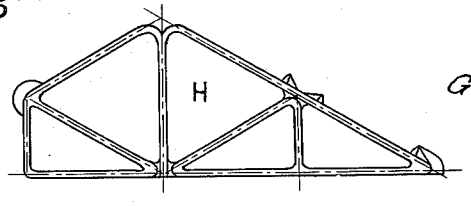
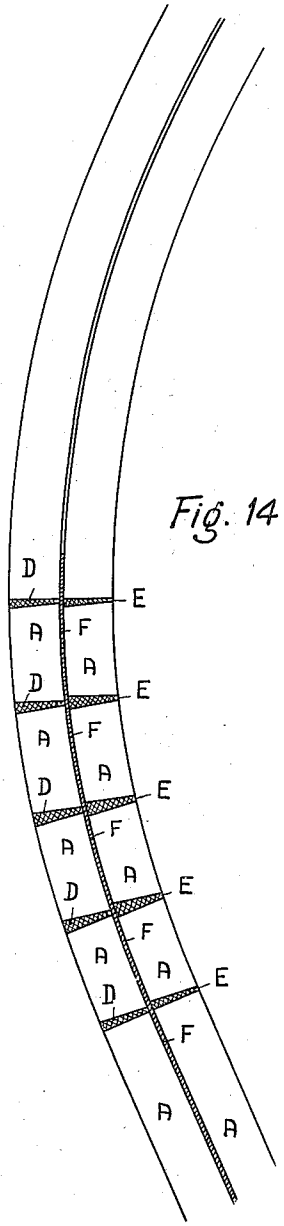


Fig. 14



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Fig. 15

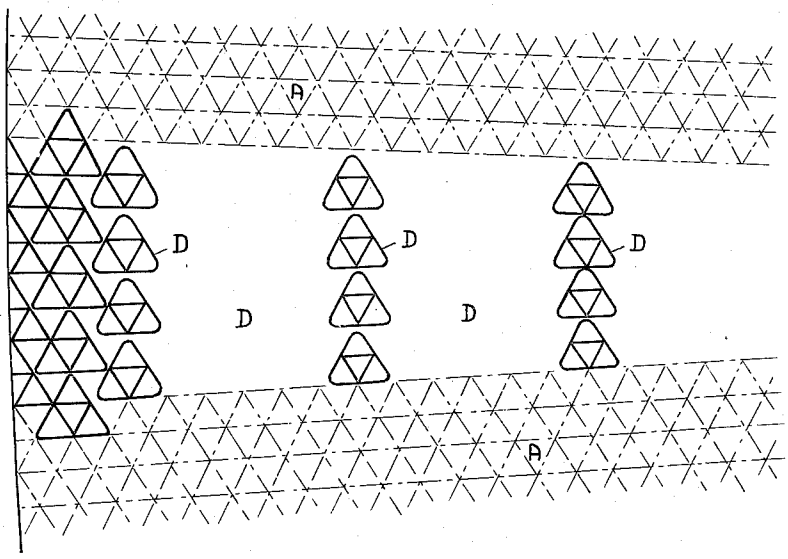


Fig. 16

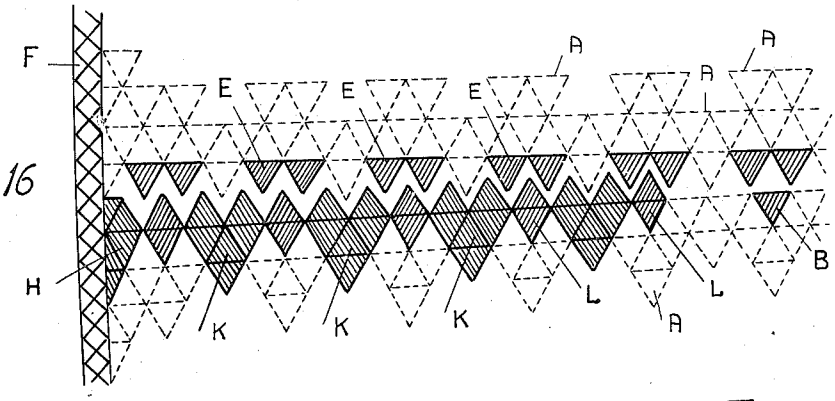


Fig. 11

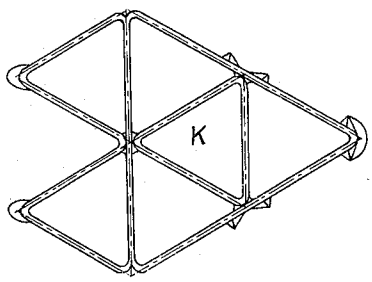


Fig. 12

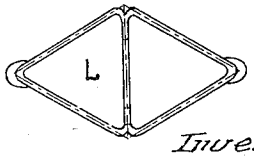
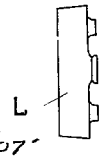


Fig. 13



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2,047,119

UNITED STATES PATENT OFFICE

2,047,119

ROAD AND LIKE PAVING

Giovanni Battista Storace, Savona, Italy

Application May 11, 1934, Serial No. 725,178
In Italy May 15, 1933

6 Claims. (Cl. 94—8)

This invention relates to road paving and particularly to road paving of the type consisting of concrete reinforced by metal frame members comprising vertical ribs the top edge of which remains at a level with the road surface, so as to form a geometrical network.

According to the invention, I provide a system of road paving of the type referred to, characterized by rows of metal frame members resting on the road bed and having vertical sides or ribs sufficiently high to form cells and so disposed that the sides of contiguous frame members are nowhere adjacent, so that no metallic surface of comparatively large width is formed, concrete or other mortar being poured into the said cells so as to fill them up to the level of the upper edges of the metal frames which are flush with the road surface.

The invention aims to provide a typical kind of road paving especially suitable for roads serving an intense traffic, for extensive road planning, flooring of large plants, etc., which paving is of easy construction, easy to repair where required, particularly resistant and non-skidding.

These advantages are attained by setting on the road bed rows of frame members, each having a geometrical shape, preferably triangular or composed of equilateral or isosceles triangular elements forming by their agglomeration a cellular surface to be filled, up to the level of the road surface, with concrete or mortar or other road material filler having the required resistance, but so as to leave the upper edges of the reinforcing frames at a level with the road surface.

The anti-skidding properties of the road paving according to the invention are obtained by setting the frames at such an angle to the axis of the road that their triangular elements are never in such a position that any of their sides or ribs are parallel to the axis of the road and also by taking care that, although the frames are set close to each other, no metallic surface of relatively large width is formed. This second feature also offers the advantage of strengthening evenly the whole of the road surface, of avoiding waste of metal, and of giving an aesthetic appearance to the road itself, owing to the regular distribution of the reinforcing elements.

The invention will be better understood by the following description, with reference to the accompanying drawings, illustrating some preferred embodiments of the invention.

Figure 1 shows in plan the appearance of a corner, such as of a rectangular square, paved with concrete and reinforced according to the invention;

Figure 2 is a vertical section of the road surface layer, on line II—II of Figure 1;

Figure 3 is a plan view of a standard triangular reinforcing frame and of two smaller frames for filling side and terminal gaps in the reinforcement of the road surface;

Figure 4 is an underneath view of the standard reinforcing frame as shown in Figure 3;

Figure 5 is a side elevation of the same;

Figure 6 is a plan view of a frame with rhomboidal cells, adapted for use as a mid-road line marking;

Figure 7 is a cross section on line VII—VII of Figure 6;

Figure 8 shows in plan a form of frame particularly adapted for use to round a curve;

Figures 9 and 10 show other frames for use to round curves and fill gaps;

Figure 11 shows another element adapted for use on curves;

Figures 12 and 13 show in plan and side view another element adapted to fill gaps and round curves, in combination with the elements shown in Figures 7 to 11;

Figure 14 shows diagrammatically an embodiment of road paving at a curve; and

Figures 15 and 16 are plan views of an extensive portion of the reinforcement along a curve, in the first case by using the elements represented in Fig. 8 and in the other using elements represented in Figure 9 to 13.

In the road paving reinforcement according to the invention, represented in Figures 1 to 5, the standard reinforcing elements are preferably constituted by cast iron frames A, shaped as an equilateral triangle, in which a smaller equilateral triangle, having the corners against the middle of each side of the outer equilateral triangle, is inscribed, in such a way as to form four like triangular cells. Setting prongs 1 and 2 disposed in pairs, at the base of the elements, at the middle of their sides and at their corners, facilitate the adjustment of the reinforcing elements, bearing in mind that each pair of prongs 2 at the corners, fit between prongs 1 at the middle of contiguous triangle sides, which must be arranged with their sides parallel to each other. A flange 2' between each pair of prongs 2 fit under the corresponding side of the adjacent frame thus holding the frame in place, even before pouring the concrete. In this way each element is normally surrounded by six similar

elements and concurs to form, with parts of the sides of these, six equilateral triangular cells practically similar to the inscribed triangle and having the same orientation with respect to it.

Prongs 1 and 2 and flange 2', besides helping the formation of the network, naturally contribute to the strengthening of the hold of the elements when sunk into the concrete, and also increase the supporting surface of their base on the ballast or on the road bed.

For filling up spaces at cul-de-sacs and like places, single equilateral triangles B are provided, the length of the sides of which is only one half of that of the sides of the frame triangles A, and with prongs at the corners only. To fill up gaps along the sides of the rows of frames half triangles C are provided.

Along a curved road suitable elements such as the triangular frame D with round corners shown in Fig. 8 or the special frames shown in Figs. 9 to 13 ought to be preferred. These elements can be arranged to fill up a triangular or trapezoidal strip situated either across the road, as shown in Figures 14 to 16, or on both sides of a mid-road line, marking the axis of the road, and normally indicated by elements F having rhomboidal cells. The latter elements are fully shown in plan in Fig. 6 and in cross section in Fig. 7. As will be seen in this latter figure, the top surface of these elements are slightly curved so as to adopt the camber of a standard road surface.

The curves may also be rounded by the use of the special elements illustrated in Figures 9 to 13 as particularly shown in Fig. 16. To this purpose cellular frame B, Fig. 3 or also frames constituted of two triangular cells E and L (Figures 9 to 12), side triangles H with projection (Fig. 10) and standard triangular frames with this triangular projection H, Fig. 11 are employed, the projecting triangular cells fitting within the gap between two adjacent triangles and serving to change the orientation of the subsequent sets of normal triangular frames.

Although frame elements with straight vertical sides or ribs only, and projecting parts have been considered, they can also be shaped with sides or ribs turned inwardly or outwardly, having cross sections of different shapes and they may be provided with apertures or cut out portions intended to reduce the weight of the frame members and elements, as seen in 3 of Figures 5 and 7.

The section of the paving in accordance with the invention is shown in Fig. 2, in which G is the bed of the road or the top of ballast on which rest elements A, B, C, sunk in concrete.

The invention can be embodied in a paving in a number of different ways. Thus it is evident that the paving of the road with concrete, reinforced by a triangular mesh work, can be completed by means of simple triangular frames as well as with triangular elements combined to form rhomboidal or hexagonal units.

The metal sides or ribs of the elements of the mesh work can be flat or curved in order to fit the shape of the substructure of the road. Moreover the frames can be provided with flat soles or wide supporting flanges or fitted with devices to render them suitable for use with gullies, manholes or like fitting as may be used in connection with public service.

I claim:

1. A road paving of concrete reinforced by metal frames, by which the metal frames are made of cast iron and each comprises a number of upright ribs disposed in triangular formation leaving therebetween a number of triangular cells, setting prongs being provided at the base of the corners and in an intermediate position of the side ribs of each pluricellular frame, the prongs at the corners fitting between the prongs on the sides when the different frames are laid in such a manner as to cause triangular cells of like formation as those of each frame to be constituted by the adjacent half-side ribs of six adjacent frames.

2. A road paving according to claim 1, by which the frames designed to reinforce the straight portions of the part of the road between the midline portion and the outmost sides are each constituted by an equilateral triangle having inscribed in its area a like equilateral triangle subdividing the area of the circumscribing triangle into four equal equilateral cells.

3. For use in concrete road paving reinforcement, cast iron frames shaped as equilateral triangles in each of which a smaller equilateral triangle is inscribed having the corners against the middle of each side of the circumscribing triangle, so as to form four like triangular cells, setting prongs disposed in pairs at the bottom part of the frames, at the corners of each circumscribing triangle and on an intermediate position of the sides, in correspondence of the corners of the circumscribed triangle, whereby the pair of prongs at the corners of each circumscribing triangle fit exactly between the pair of prongs on the sides of adjacent triangles and a web or flange between each pair of prongs at the corners.

4. A concrete road paving reinforcement comprising cast iron frames of the kind outlined in claim 3, disposed with the web between the prongs at the corners under the middle part of the sides of adjacent frames, whereby each four-cellular frame is surrounded by six like frames coacting with the sides thereof to form six equilateral triangular cells similar to those formed by the inscribed triangle of each frame.

5. A road paving reinforcement comprising normal triangular cast iron frames of the kind outlined in claim 3 in the parts of the straight portions of the road between the outer margins and the midline, frames composed of simple triangular cells and frames composed of a pair of single triangular cells joined together for filling the gaps at the sides and triangular frames with rounded corners at the curves.

6. A road paving reinforcement comprising normal triangular cast iron frames of the kind outlined in claim 3 in the parts of the straight portions of the road between the outer margins and the midline, frames composed of simple triangular cells and frames composed of a pair of single triangular cells joined together for filling the gaps at the sides and frames composed of a normal frame member carrying a pair of simple triangular frames attached to one of the sides for rounding the curves.

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