Sept. 9, 1930. L. GAISMAN 1,775,278

CONSTRUCTION OF ROADWAYS AND THE LIKE

Filed July 16, 1928 3 Sheets-Sheet 1

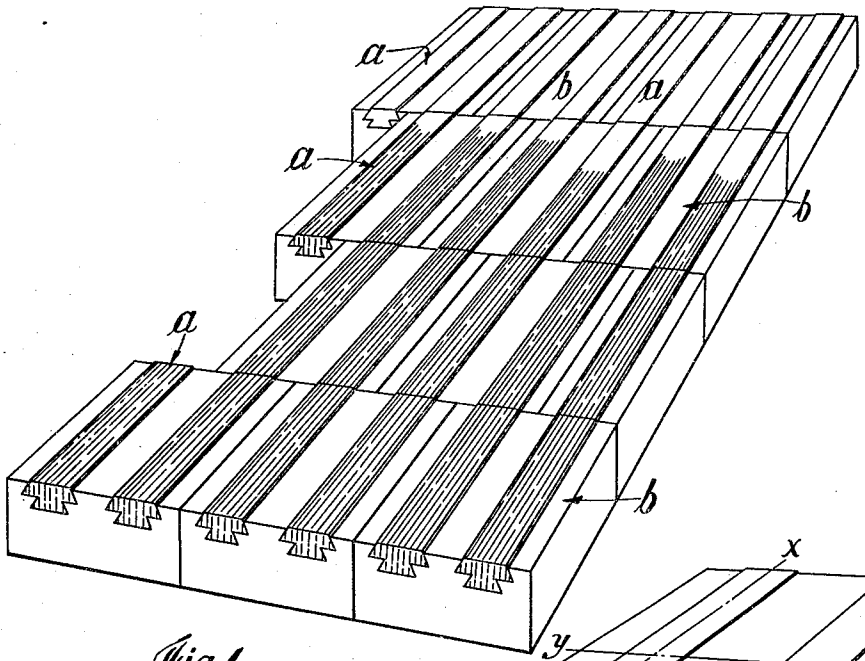

Fig. 1.

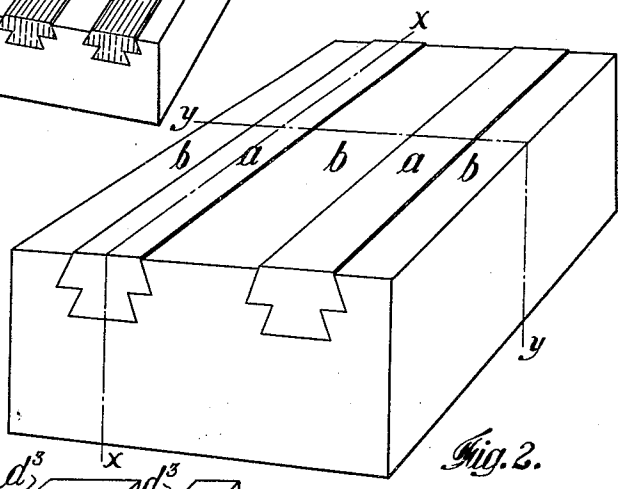

Fig. 2.

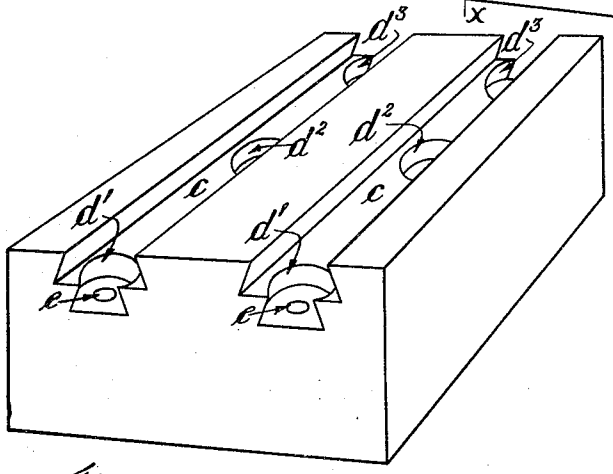

Fig. 3.

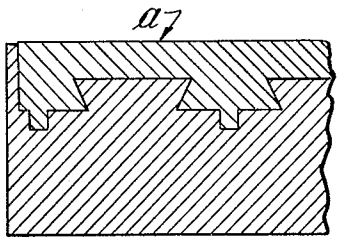

Fig. 8.

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Sept. 9, 1930. L. GAISMAN 1,775,278

CONSTRUCTION OF ROADWAYS AND THE LIKE

Filed July 16, 1928 3 Sheets-Sheet 2

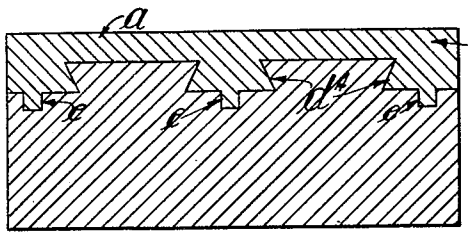

Fig.4.

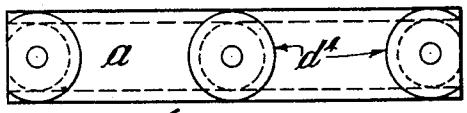

Fig.5.

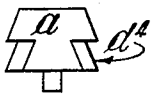

Fig.7.

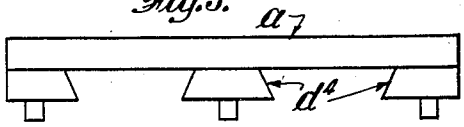

Fig.6.

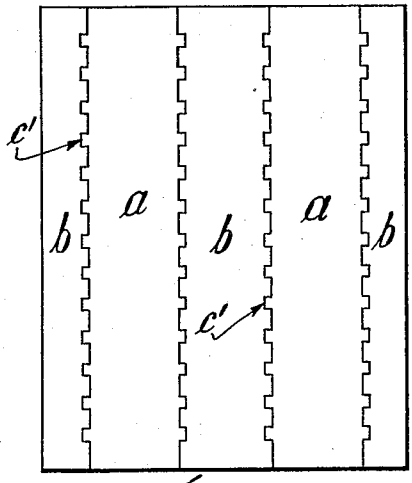

Fig.9.

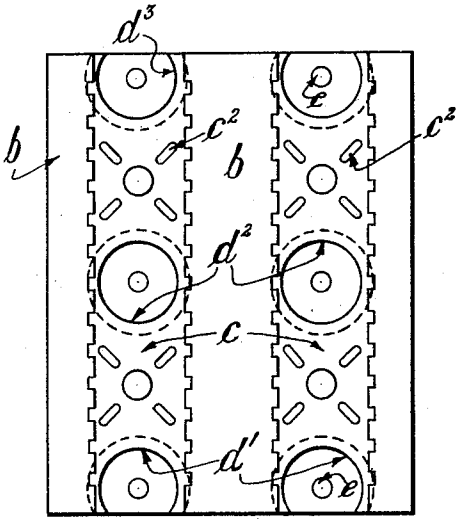

Fig.11.

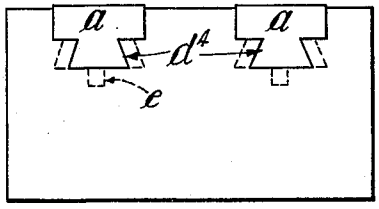

Fig.10.

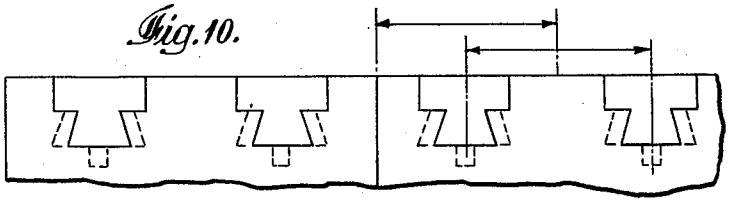

Fig.12.

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Sept. 9, 1930. L. GAISMAN 1,775,278

CONSTRUCTION OF ROADWAYS AND THE LIKE

Filed July 16, 1928 3 Sheets-Sheet 3

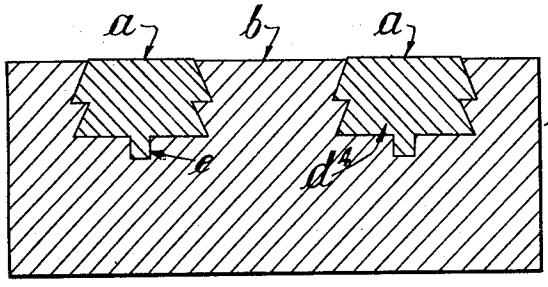

Fig. 13.

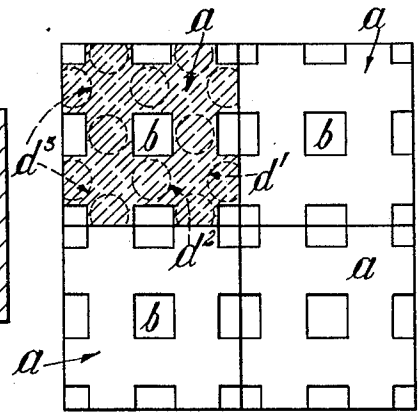

Fig. 16.

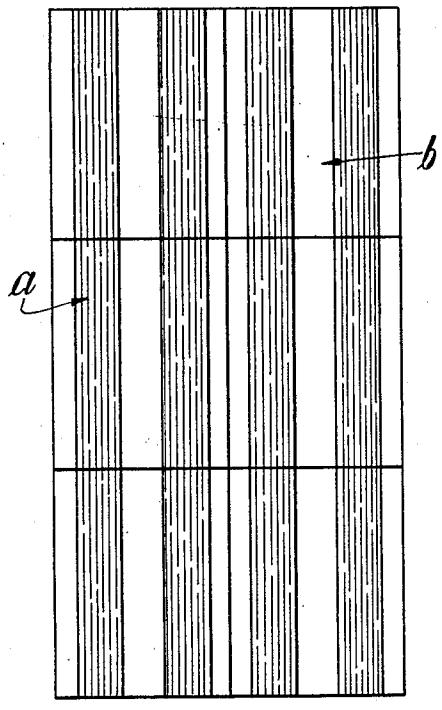

Fig. 14.

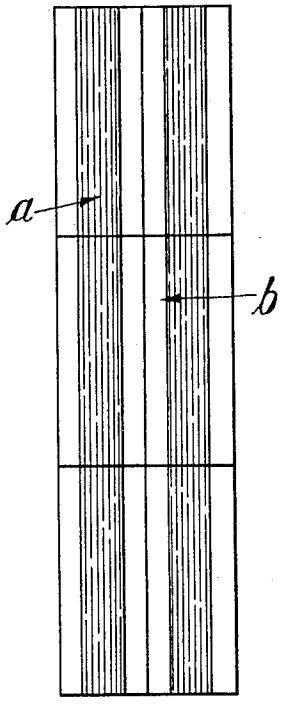

Fig. 15.

Inventor:
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Patented Sept. 9, 1930

1,775,278

UNITED STATES PATENT OFFICE

LUCIEN GAISMAN, OF AUDENSHAW, NEAR MANCHESTER, ENGLAND

CONSTRUCTION OF ROADWAYS AND THE LIKE

Application filed July 16, 1928, Serial No. 292,939, and in Great Britain September 22, 1927.

This invention refers to roadways of the kind comprising a resilient surface applied to and supported by a relatively hard surface, usually in the form of blocks, the upper surfaces of which are in part formed of rubber or rubber composition.

One of the objects of the invention is to provide an improved roadway of the kind named giving an improved non-skid and comparatively noiseless surface, while a further object is to provide a construction of block embodying in its top face the two materials for producing the improved roadway in a manner such as to prevent relative displacement of such materials in all directions.

According to the invention, the improved roadway comprises parallel and continuous (or substantially continuous) "lines" or strips of rubber or the like, and alternate continuous "lines" or strips of hard road material, the "lines" running parallel with the normal direction of travel of the traffic and being spaced apart and of such a width that the wheels of most vehicles are supported partly on the rubber, and partly on the hard material, but never on the hard material only.

Paving blocks suitable for producing the main parts of the improved roadway are preferably made with two parallel grooves in their top faces, and in such grooves strips of rubber or the like are moulded, the top surface of the rubber lying flush with the top surface of the block material, or being slightly proud of same. The size of the blocks and spacing of the rubber strips will be such as to allow the rubber strips when the blocks are laid in staggered relationship, or otherwise, to form a continuation of the strips of the next succeeding and preceding blocks.

For completing the roadway next a kerb, gutter, etc., the blocks are half-width and have one groove only. Alternatively, the whole roadway may be made of the half-width blocks with a single groove in which case the blocks are laid end to end and in other than staggered relationship.

The formation of each groove and/or of the block immediately below the groove is such as to afford a firm anchorage of the rubber to the block in all directions and especially in the direction of traffic, the preferred arrangement consisting of dovetail shaped recesses in the floor of each groove, which latter may also be of dovetail cross section, or which may be of rectangular cross section with lateral notches in the vertical sides of the groove. The floor of each groove or recess may also have small sinkings.

The rubber may be of two degrees of hardness, giving a relatively resilient upper surface or tread, and a relatively hard (unyielding) base to ensure firm connection and keying to the block.

The invention will be further described in reference to the accompanying drawing, wherein:

Fig. 1 is a perspective view of part of a road surface constructed according to the invention, and showing the continuous "lines" of rubber and the alternate continuous "lines" of hard road material.

Fig. 2 is a perspective view of one of the paving blocks used in forming the road surface shown in Fig. 1.

Fig. 3 is a like view of the same block but without the rubber strips.

Fig. 4 is a longitudinal geometrical section on line x—x of a like block to that shown in Fig. 2.

Fig. 5 is an inverted plan view.

Fig. 6 is a side view, and

Fig. 7 an end view of one of the rubber strips separate from the block.

Fig. 8 is a longitudinal section of a part of a modified form of block.

Fig. 9 is a plan view, and

Fig. 10 an end view of another example of the improved paving blocks.

Fig. 11 is a plan of the same block prior to being fitted with the rubber strips.

Fig. 12 is an end elevation of the upper parts of two blocks laid side by side.

Fig. 13 is a cross section of Fig. 2 on line y—y.

Fig. 14 is a plan view of an alternative way of laying the blocks shown in Figs. 2 and 3.

Fig. 15 is a plan view of blocks having only a single rubber strip.

Fig. 16 is a plan of a block suitable for use at a cross road.

Referring to Fig. 1, *a*, *d* are the "lines" of rubber and *b*, *b* the alternate "lines" of hard road material. Such roadway is preferably produced by the use of blocks made of hard wearing material such as brick, terra cotta, metal, concrete or the like, with one, two or more inlaid strips of rubber. For the main portion of the roadway, the blocks are preferably constructed to embody in their top surfaces two strips of rubber or other suitable resilient material. The two-strip blocks are preferably laid in staggered relationship so as to "break joint", see Fig. 1, but they may be laid in line with one another, see Fig. 14.

For certain parts of the roadway, such as next to a kerb, or next to a grid or man-hole or the like, half-width blocks are used having a single rubber strip, see Figs. 1 and 15.

The positions of the rubber strips in the two-strip block and the proportions of the strips are preferably such, that when the blocks are laid in a roadway the "lines" of rubber and "lines" of block material are of even pitch and approximately equal in width, see Fig. 12.

The two-strip blocks are preferably constructed as shown in Figs. 1 to 7, or Figs. 9 to 11. The proportions of the blocks may vary, but convenient dimensions in plan are 10⅜″ x 8⅝″.

In the top surface of the block (see Fig. 3) are formed two parallel open-ended grooves *c*, *c* with undercut sides. These grooves are of such a width and are so spaced apart, as to leave an amount of block wearing surface approximately equal to the width of the grooves. In the floor of each groove are three undercut recesses d^1, d^2, d^3, the central recess d^2 being circular in plan, and the other recesses d^1, d^3 being segmental in plan, i. e., more than half but less than a full circle, and opening out on to the end faces of the block. In the floor of each recess is or may be one or more small sinkings *e*.

In each groove and its recesses is moulded a solid rubber or like strip *a* which completely fills the groove from end to end, and from top to bottom, and also completely fills the recesses d^1, d^2, d^3 and sinkings *e*, the top surface of the rubber being flush with or slightly higher than the top face of the block.

By reason of the dovetail formation of the groove and recesses, the rubber, when moulded therein, partakes of the same formation, and thereby becomes firmly anchored to the block, the groove effectually preventing the rubber lifting and moving sideways, and the recesses (and rubber studs d^4 formed thereby, see Fig. 6) preventing movement of the rubber relatively to the block in all directions. Furthermore, owing to the recesses d^1, d^3 opening on to the end faces of the block, the rubber in such recesses lies flush with said end faces, and by reason of the recesses being more than a semi-circle, the rubber strip is held firmly to the block right up to its extreme ends, those parts of the recess next the end faces embracing the stud-like part of the rubber for more than a semi-circle and right up to the end faces, and thereby preventing the ends of the strip rising up and leaving the block.

As aforesaid, the rubber strips which will be of hard wearing quality may be made with a hard base to ensure a firm connection with the block.

Instead of the grooves *c*, *c* extending the full length of the block, and the recesses d^1, d^3 opening on to the end faces of the block, the grooves and recesses may stop short of such end faces to the extent of a thin wall of block material as shown in Fig. 8. Such thin wall may be vertical or undercut on its inner face. In some cases the grooves *c*, *c* may extend to the end faces of the block while the recesses d^1, d^3 do not open on to the end faces of the block.

Instead of the sides of the grooves being undercut, they may be vertical, as in Figs. 9, 10 and 11, reliance being placed on the dovetail recesses d^1, d^2, d^3 and on the dovetail studs d^4 of the rubber to hold the rubber to the block, and notches c^1 being formed in the vertical sides of the grooves *c*, *c* to help in resisting longitudinal disturbance of the rubber strips relatively to the grooves.

In the floor of each groove *c* may be further sinkings c^2 for helping to position the rubber and also to prevent creeping. These sinkings may take various forms, including grooves which are V-shape in plan.

To apply the rubber strips to the blocks, the rubber is moulded to the block, or the block is moulded to the rubber. To mould the rubber to the block, the latter, previously grooved and formed with the dovetail recesses, is placed in a metal frame or box, grooved side uppermost, and into the grooves and recesses rubber is vulcanized under a press, or in any other known manner. On removal of the block from the frame or box, it is ready for laying in a roadway.

To mould the block to the rubber, the latter, previously moulded and vulcanized to the required shape, is placed face downwards in a box equal in size to the desired size of the block, and into the box is then poured the mouldable block material, such as cement concrete or the like. After drying and setting hard, the block, with the rubber strips attached (i. e., intermoulded with it) is removed from the box when it is ready for use.

In the case of the pre-moulded block, made of brick, terra-cotta or the like, the recesses d^1, d^2, d^3 are formed in the block while in the

plastic, or semi-plastic state, and preferably by the machine forming the subject of Letters Patent No. 1,629,660 dated 24th May 1927. In the case of metal blocks, the recesses will be formed in the casting or moulding of the metal.

Although preferring circular and segmental recesses in the floor of each groove for anchoring the rubber to the block, it will be understood that other forms of dovetail or undercut recesses may be employed, although these will usually only be used when the block is moulded on to the already-formed rubber strips.

At cross roads, the blocks may have grooves running at right angles to one another, see Fig. 16, and at other than cross roads such as right angled, or curved bends, the blocks and grooves may be curved, in order that the rubber strips may follow the line of traffic at such bends.

If desired, there may be more than two grooves and rubber strips in each block, the number depending on the width and spacing of the rubber lines and/or size block. Fig. 12 shows the usual spacing and width of rubber and block material, but the width of the strips of rubber and of the alternate block material may be varied to suit the wheels of the vehicles mostly to be expected in any particular locality.

The floor of each groove *c* may be flat (horizontal), or it may be convex or concave longitudinally, or corrugated transversely, in order to further help in resisting the endwise disturbance of the rubber. The tread surface of the block and of the rubber (or both) may be flat and smooth, or they may be ribbed or studded, or have a pattern to increase the non-slip properties.

With a roadway paved with the improved blocks, and with the rubber strips arranged in continuous lines a road surface is produced in which continuous "lines" of rubber and alternate continuous "lines" of hard block material are provided with which the wheels of vehicles can each simultaneously and continuously engage and thus benefit by the properties of both. With the rubber anchored to the blocks to resist movement in all directions, the lines of rubber have no tendency to creep or become dislodged when heavy traffic is passing over them. And with the rubber of hard wearing quality, it serves to protect the block material (say terra cotta or concrete) from excessive wear, and by its resistance the rubber will usually take the bulk of the load, and will tend to equalize the wear of the two materials, whilst always giving a practically noiseless and non-skid surface.

In addition to affording a combination of different wearing and supporting surfaces, the improved block, as compared with a block of like size with its top surface wholly covered by rubber, effects a considerable saving in cost.

What I claim is:

1. A roadway or the like for vehicular traffic, the surface of which is composed partly of hard road material and partly of rubber, the rubber being embedded and anchored against relative movement in all directions, in the hard road material, the hard road material having undercut grooves extending longitudinally of the roadway and parallel to one another, and said grooves in their bottom faces having undercut recesses for the reception of the rubber, which completely fills the grooves and recesses, the hard road material and the rubber forming alternate parallel strips of hard and elastic material which extends over substantially the whole area of the roadway and present an elastic, non-skid and noiseless surface in strip form, intermixed with a surface of hard road material in strip form, the width of the strips being such that vehicle wheels not less than three inches wide will always run partly on the rubber and partly on the hard road material, as set forth.

2. A roadway or the like for vehicular traffic, the surface of which is composed of paving blocks of hard wearing, heat-resisting yet mouldable material, and strips of rubber lying in undercut open-ended grooves in the upper faces of said blocks, each groove having undercut recesses in its bottom face and the rubber completely filling the grooves and recesses so that it is anchored relatively to each block in all directions, the blocks being laid side by side and collectively producing a road surface composed of alternate longitudinal strips of rubber and block material, which extends over substantially the whole area of the roadway and presents a combined elastic, non-skid and noiseless surface in strip form, intermixed with a surface of hard block material in strip form, the width of the strips being such that vehicle wheels not less than three inches wide will always run partly on the rubber and partly on the hard block material, as set forth.

3. A roadway or the like for vehicular traffic, the surface of which is composed of paving blocks of hard wearing, heat-resisting yet mouldable material, and strips of rubber lying in undercut open-ended grooves in the upper faces of said blocks, each groove having undercut recesses in its bottom face and the rubber completely filling the grooves and recesses so that it is anchored relatively to each block in all directions, the blocks being laid side by side and collectively producing a road surface composed of alternate longitudinal strips of rubber and block material, which extends over substantially the whole area of the roadway and presents a combined elastic non-skid and noiseless surface in strip form,

intermixed with a surface of hard block material in strip form, as set forth.

4. Paving blocks for roadways and the like as claimed in claim 2, wherein each groove has at each end in its bottom face an undercut recess which is more than half a circle and less than a full circle in plan and opens on to the adjacent end face of the block, and each groove also having a further undercut recess in its bottom face at a point intermediate of the ends of the groove, which further recess is circular in plan, as set forth.

5. Paving blocks composed of a hard wearing, heat-resisting yet mouldable material having inlaid rubber strips in their top faces anchored in all directions, assembled in staggered relationship one to another to form a roadway, and to provide parallel and narrow strips of block material, and alternate parallel and narrow strips of rubber, the strips running longitudinally of the roadway and lying at distances apart which divide the road surface into a multiplicity of non-skid and noiseless "lines", alternating with similar "lines" of block material, as set forth.

6. Paving blocks as claimed in claim 5, wherein the rubber strips are located in open-ended grooves having vertical faces and vertical notches in said faces, and wherein each groove has undercut recesses in its bottom face, which are engaged by like projections on the underfaces of the rubber strips, the recesses, grooves and notches preventing movement of the rubber relatively to the block in all directions, as set forth.

In testimony whereof I have signed my name to this specification.

LUCIEN GAISMAN.