June 12, 1928. 1,673,630

N. G. MADGE

PAVING CONSTRUCTION

Filed June 11, 1925 2 Sheets-Sheet 1

Fig. 1

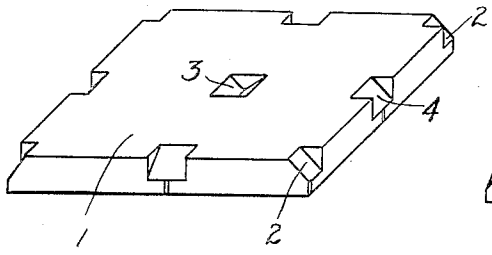


Fig. 2

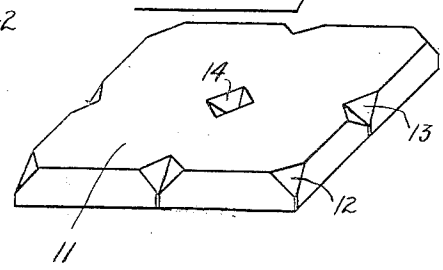


Fig. 3

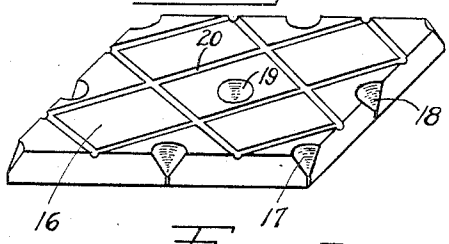


Fig. 4

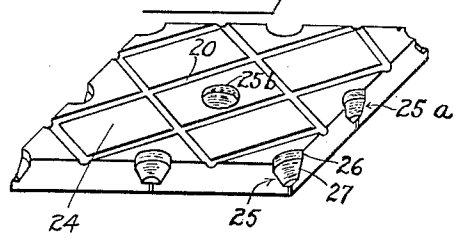


Fig. 5

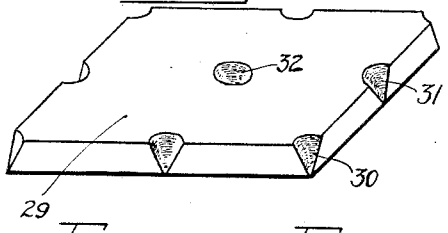


Fig. 6 Fig. 7 Fig. 8

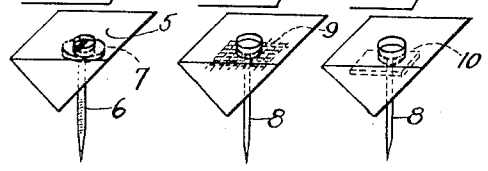


Fig. 9

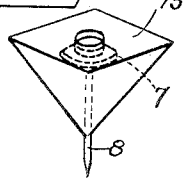


Fig. 10

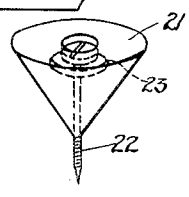


Fig. 11

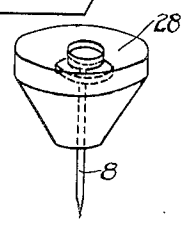
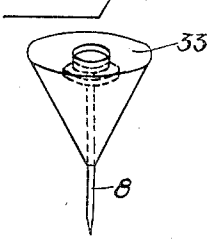


Fig. 12



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June 12, 1928.

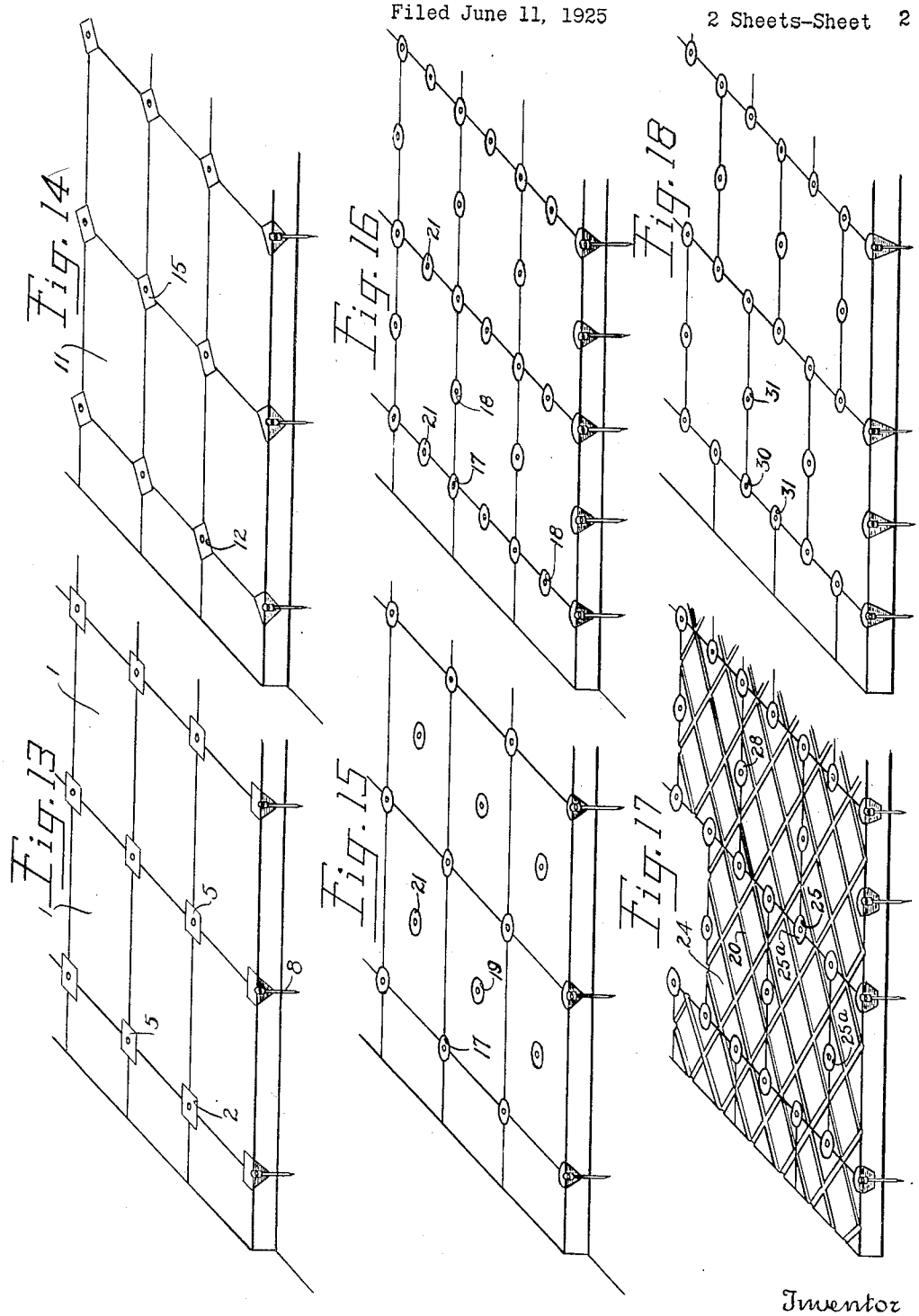
1,673,630

N. G. MADGE

PAVING CONSTRUCTION

Filed June 11, 1925

2 Sheets-Sheet 2



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Ernest A. Hoffman

Patented June 12, 1928. 1,673,630

UNITED STATES PATENT OFFICE.

NORMAN G. MADGE, OF PROVIDENCE, RHODE ISLAND, ASSIGNOR TO THE MECHANICAL RUBBER COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF NEW JERSEY.

PAVING CONSTRUCTION.

Application filed June 11, 1925. Serial No. 36,295.

This invention relates to a paving construction, more particularly to the construction of a paving unit or block and its anchoring means, which is especially adaptable for use with rubber pavements.

Heretofore in connection with the utilization of rubber paving blocks as a surface for roads, sidewalks, bridges, etc., various expedients have been proposed for anchoring them to the foundation or base of the roadway. Projecting lugs of rubber molded integral with the block and adapted to be buried in concrete before it sets have been tried but found unsatisfactory in that they work loose or separate. Various forms of projections and recesses constituting a species of lap joints have been provided on the blocks or rubber units, but these have been found objectionable for the reason that but a fraction of the thickness of the block is utilized for the anchorage, and further, they have necessitated the use of expensive and intricate mold equipment. These and other expedients have been employed, but none have been entirely satisfactory.

The present invention aims to provide a type of paving block and anchorage which is inexpensive to manufacture, reliable and positive in use, capable of application to various types of foundation, but especially to a plank base such as is used on bridges, which utilizes ordinary fastening devices not requiring any skilled labor, does not require the use of cements, and generally, represents a long sought desideratum in the art. It also aims to provide an anchorage or fastening which is applied from the upper or wearing surface of the pavement and which will permit the removal of any unit without disturbance of the surrounding ones. It further aims to provide a corner anchorage for the paving units with the use of a minimum number of fastenings, and to provide an anchorage forming part of the wearing surface and having similar physical properties to the latter.

With the illustrated embodiments of the invention in mind, but without intention to limit the scope more than is required by the prior art, the invention, briefly stated, consists in the use of tapering plugs of conical, pyramidal, or other flaring shape, and provided wtih means for securing them to a base, which plugs are adapted to fit in complementary recesses formed preferably in the corners of adjoining blocks, but which may be additionally formed in the side walls or within the bodies of the blocks or in all three locations. The plugs may be made of any suitable yielding material but preferably are made of the same composition as the body of the paving blocks, these latter being preferably made of vulcanized rubber suitably compounded to provide the necessary resilience, strength, and resistance to abrasion in street traffic, the plugs when in place forming part of the wearing surface.

For a detailed disclosure of the nature and objects of the invention reference is had to the accompanying specification and drawings, in which latter,

Fig. 1 is a perspective of a paving block or unit formed with recesses shaped according to one embodiment of the invention;

Fig. 2 is a perspective of a similar block illustrating another embodiment of the invention;

Figs. 3, 4 and 5 illustrate blocks embodying other forms of the invention;

Figs. 6, 7, 8, 9, 10, 11, and 12 illustrate in perspective different forms of anchorages for use with the blocks shown in the previously described figures; and

Figs. 13, 14, 15, 16, 17, and 18 illustrate in perspective various types of pavements as laid using the various forms of blocks and anchorages.

Referring to the drawings the numeral 1 (Figure 1) designates a paving block or unit which may be of any suitable material, but as the invention is particularly applicable for use with rubber pavements it is preferred to make the block of a suitable rubber composition. In the form shown in Figure 1 the block is of rectangular shape and is provided at each corner with inclined cut-away portions 2 as shown. It will be seen from Figure 13 that when this block is laid, the cut-away portion at each corner forms, in conjunction with the cut-away portions of three adjoining blocks, a wedge-shaped recess similar to the wedge-shaped recess 3 shown in the body of the block. If desired the block may be also provided with cut-away portions on its edges intermediate the corners, said portions being of the general shape indicated at 4 so that each cut-away portion 4 in conjunction with the cut-away portion of an adjoining block or blocks will form a wedge-shaped recess similar to the

wedge-shaped recess 3 shown in the body of the block. It is particularly desirable that the blocks be securely fastened at the corners, but the blocks can also be equipped with either the cut-away portions 4 or 3 or with both in addition to the corner cut-away portions 2. In the case of pavements formed with small units or blocks it may be sufficient to fasten them at the corners, while with larger units or units of an elongated shape it may be desirable to also use the body recesses or the intermediate edge recesses in addition to the corner ones. Preferably small cut-away portions also extend from the bottom of each recess to the bottom of the block to form screw or nail holes for a purpose later described. When laying the blocks they are placed edge to edge, and in the form of pavement shown in Figure 13 they are also placed corner to corner, and in each corner recess there is then disposed a wedge-shaped anchorage member or plug 5 such as shown in Figure 6. This anchorage member is preferably formed of the same composition as the block and is of a shape complementary to the recess in which it is to be disposed. To secure the plug or anchorage member in place it is provided with some form of fastening such as the screw 6 shown in Figure 6, and in order to firmly hold the screw in the body of the plug the latter may have molded or otherwise disposed therein a metallic washer 7. In place of the screw 6 there may be used nails 8 as shown in Figures 7 and 8, and there may also be substituted for the washer 7 a piece of wire mesh or fabric 9 as shown in Figure 7, or a piece of hard rubber 10 as shown in Figure 8.

Figure 13 shows a perspective of a pavement formed of blocks such as shown in Figure 1, the blocks in this embodiment being provided with corner recesses only. If in addition intermediate edge recesses are provided in the blocks they may be either laid in the same arrangement as shown in Figure 13 or alternatively may be laid in a staggered form similar to that shown in Figure 18.

In the modified form of block shown in Figure 2 the block 11 is provided at its corners with a bevelled triangular cut-away portion 12, and it will be seen that this portion will in conjunction with the corners of three adjoining blocks form a four-sided pyramidal recess in the manner shown in Figure 14. The block may also if desired be formed at its intermediate edge portions with cut-away portions 13 each forming half of a four-sided pyramidal recess, and it can also be provided in its main body portion with an entire pyramidal recess 14. In order to anchor the block of this modification in place on a base a pyramidal anchoring plug 15 is provided as shown in Figure 9, which is of a size to exactly fit in the recesses with its top surface preferably flush with the top surface of the block. The anchorage plug 15 may be provided with any suitable fastening means such as the nail 8 as shown in Figures 7 and 8, but instead of the nail there may be substituted the screw 6 shown in Figure 6. The plug 15 is also provided with a metallic washer 7 for holding the nail or screw in place, and this washer may be substituted by any of its equivalents as shown in Figures 7 and 8. The block shown in this modification may be laid in a corner to corner arrangement as shown in Figure 14 or alternatively it may be laid in a staggered arrangement similar to Figure 18. It is also obvious that since the corner recesses are formed by merely bevelling off the corner of the block, when using this form of anchorage the blocks may be made in other shapes than rectangular, such as triangular or hexagonal, the anchorage plugs in this case being in the form of hexagonal or triangular pyramids as the case may be.

In the form shown in Figure 3 the block 16 is formed at its corners with tapering arcuate or quarter conical cut-away portions 17, and when the blocks are laid the cut-away portions at four adjoining corners together form a conical recess. As in the previously described forms additional recesses may be provided by forming half conical cut-away portions 18 in the side edges of the blocks and if desired complete conical recesses 19 may be formed in the body of the block. In this block there are also shown shallow grooves 20 cut in the surface of the block, which grooves may be made to form any desired pattern and give increased traction. These grooves or modifications of them may also obviously be formed in any of the embodiments of the invention. To secure this type of block in position on a foundation, conical plugs 21 are provided as shown in Figure 10, and these plugs may be provided with fastening screws 22 similar to the screw 6 or instead if desired nails may be used. As shown the plugs are provided with embedded metallic washers 23 similar to the washer 7, but any of the equivalents for these washers shown in Figures 7 and 8 may be used. The block 16 may be laid in any of the arrangements previously or later described, using side edge or central recesses or both in addition to the corner ones, as may be deemed necessary or desirable. In Figure 15 is shown a pavement formed of a block similar to that shown in Figure 3 but without the surface grooving 20 and without the side cut-away portions 18 so that the blocks are secured only at their corners and in the body portion. Figure 16 shows a pavement similar in all respects to Figure 15 but with the

body recesses 19 omitted from the blocks and with the intermediate edge recesses 18 substituted.

In Figure 4 there is shown a block 24 similar to that shown in Figure 3, but the corner cut-away portions 25 instead of being conical in general contour are of a part cylindrical shape at 26 adjacent the surface of the block and below this of a part frusto-conical shape at 27. In Figure 11 there is shown a plug 28 of a shape adapted to fit into four adjoining recesses of the type just described, and it will be seen that the bottom of the recess 25 forms a seat against which the end of the plug 28 may rest. The plug 28 may be provided with any of the fastening devices shown in Figures 6, 7 and 8. Side recesses 25^a and body recesses 25^b may be used where desired or necessary. In Figure 17 there is shown a pavement having the blocks 24 in a staggered arrangement using corner and side recesses, but a corner to corner arrangement similar to Figures 13 to 16 may be used instead.

In the modification shown in Figure 5 the block 29 is provided at its corners with tapering arcuate or quarter conical cut-away portions 30 which are similar to the cut-away portions 17 in the blocks 16 but they extend through the block sufficiently to bring the point or apex of the cut-away portion at the lower surface of the block. The block may also be provided with semi-conical cut-away portions 31 along its edges and with entire conical recesses 32 in its body, if desired. The manner of laying and securing this block is similar in all respects to that of the block 16, the only difference being that the anchoring plug 33 is made of a length sufficient to fit the recesses. In Figure 18 is shown a pavement formed of blocks similar to the blocks 29 but with the central recesses 32 omitted, the blocks being laid in a staggered arrangement.

It will be seen that in all forms of my invention the paving block is securely anchored at the corner and this anchorage is secured with a minimum number of fastenings consistent with the desired strength, the intermediate edge recesses and plugs and the body recesses and plugs being only necessary where the block is of considerable area or elongated or where it is desired to lay the blocks in a staggered arrangement. While it is not essential that the plugs be flush with the balance of the pavement it is preferred to form them in this manner, and there is thus formed a smooth pavement which is of uniform yielding and wearing quality throughout its surface owing to the fact that the plugs are made of the same material as the blocks. The method of anchoring the blocks is such that especially skilled labor is not required and standard fastening means such as screws or nails may be used. The anchorage being applied from the top there is no difficulty in placing it in position, and if through accident or otherwise any of the blocks become injured they may be readily replaced without disturbance of the surrounding blocks. Various forms of base or foundation may be used, and the invention is particularly applicable for use in flooring bridges where a plank foundation is frequently used. It is also pointed out that the various forms of anchoring recesses are such that they may be readily formed in the block either by molding or by cutting away the block at the points desired.

While a number of specific embodiments of the invention have been disclosed it is obvious that the above disclosure will suggest others and it is not desired that the appended claims be limited otherwise than as required by the prior art.

Having thus described my invention what I claim and desire to protect by Letters Patent is:

1. A rubber paving comprising a plurality of blocks or units provided with tapering recesses formed in the margins of adjoining blocks and convergent toward the bottom of the blocks or units, in combination with a plurality of plugs adapted to fit within said recesses, and means independent of and adapted to pass through said plugs for attaching the same to a foundation.

2. A rubber paving comprising a plurality of rubber blocks or units provided with tapering recesses formed by complementary cut outs in the margins of adjoining blocks and convergent toward the bottom of the blocks or units, in combination with a plurality of plugs adapted to fit within said recesses, and means independent of and adapted to pass through said plugs for attaching the same to a foundation, said plugs being of the same rubber composition as the blocks and provided with holes substantially centrally thereof for receiving the attaching means.

3. A rubber paving comprising a plurality of blocks or units provided with tapering recesses convergent toward the bottom of the blocks or units, at least some of said recesses being jointly formed in adjacent blocks in combination with a plurality of plugs adapted to fit within said recesses, and means adapted to pass through said plugs for attaching the same to a foundation, said plugs being of a length less than the thickness of the body of the blocks or units, and being provided with an abutment surface at their lower extremities adapted to contact with a correspondingly shaped seat provided in the lower portions of the recesses formed in said blocks or units.

4. A rubber paving comprising a plurality

of blocks or units provided with tapering recesses convergent toward the bottom of the blocks or units, in combination with a plurality of plugs adapted to fit within said recesses, and means adapted to pass through said plugs for attaching the same to a foundation, said plugs being provided internally with a reinforcement for the head of the attaching means.

5. A rubber paving comprising a plurality of blocks or units provided with tapering recesses convergent toward the bottom of the blocks or units, in combination with a plurality of plugs adapted to fit within said recesses, and means adapted to pass through said plugs for attaching the same to a foundation, said plugs being provided with an internal reinforcement of rubber composition harder than the body of the plugs.

6. A rubber paving comprising a plurality of blocks or units provided with conjoint tapering recesses at their adjacent edges convergent toward the bottom of the blocks or units, in combination with a plurality of plugs adapted to fit within said recesses, and means independent of and adapted to pass through said plugs for attaching the same to a foundation, said plugs being provided with a blunt nose or lower surface adapted to engage an abutment or stop fashioned in the bottom of the recesses provided in the blocks or units.

7. A rubber paving comprising a plurality of blocks or units provided with tapering recesses convergent toward the bottom of the blocks or units, in combination with a plurality of plugs adapted to fit within said recesses, and means independent of and adapted to pass through said plugs for attaching the same to a foundation, certain of said recesses being formed by complementary cut-outs in adjoining peripheral portions of the blocks.

8. A pavement comprising a plurality of units of resilient material, each unit being cut away at the corners to form with adjoining units a recess tapering toward the bottom, and a plug of similar material fitting in said recess, said plug being adapted for connection to a foundation.

9. A pavement comprising a plurality of units of resilient material, and separate means of similar material at the corners of the units for wedging together the units and anchoring them to a foundation.

10. The combination with a foundation member, of a plurality of resilient members co-operating to form a wearing layer for the foundation member, resilient members connecting together a plurality of the members of said wearing layer and provided with a reinforcing member, and fastening devices extended through said resilient connecting members and said reinforcing member for securing the wearing layer to said foundation member.

Signed at New York, county of New York, and State of New York, this 9th day of June, 1925.

NORMAN G. MADGE.