June 23, 1936. P. A. VOIGT ET AL 2,045,256

MACHINE FOR INSERTING A COMPRESSED STRIP INTO A JOINT

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Fig. 1

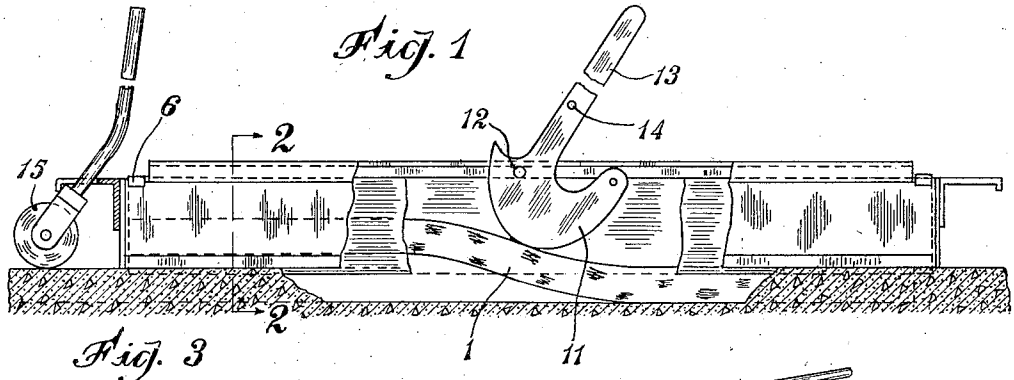


Fig. 3

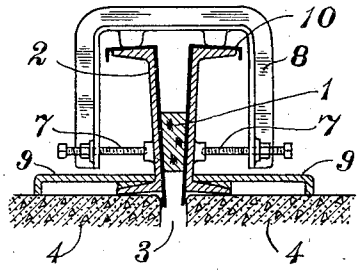


Fig. 2

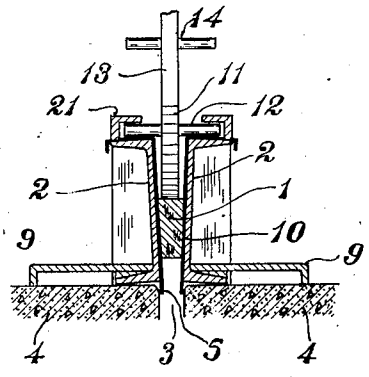


Fig. 4

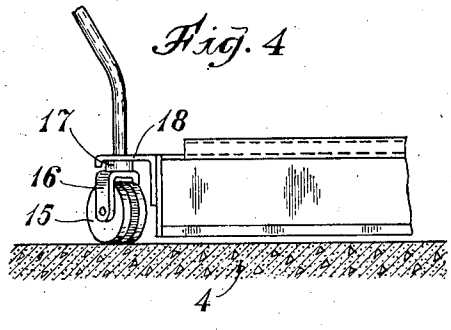


Fig 5

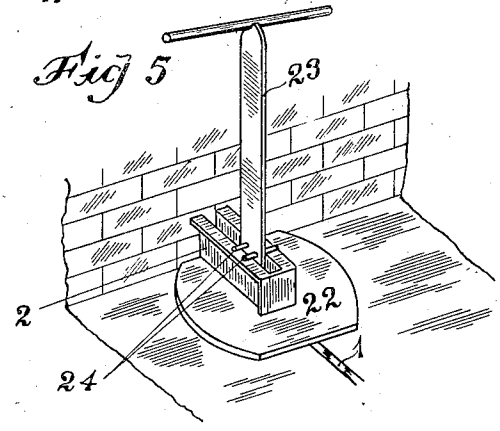
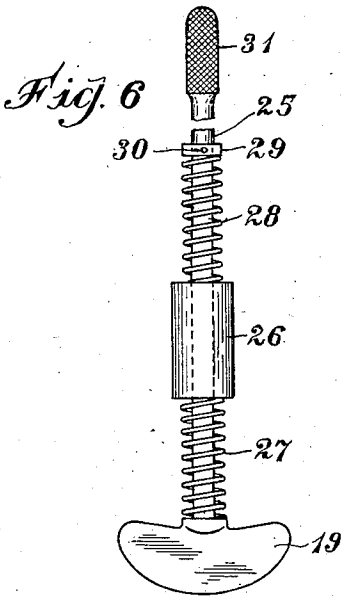


Fig. 6



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Fig. 7

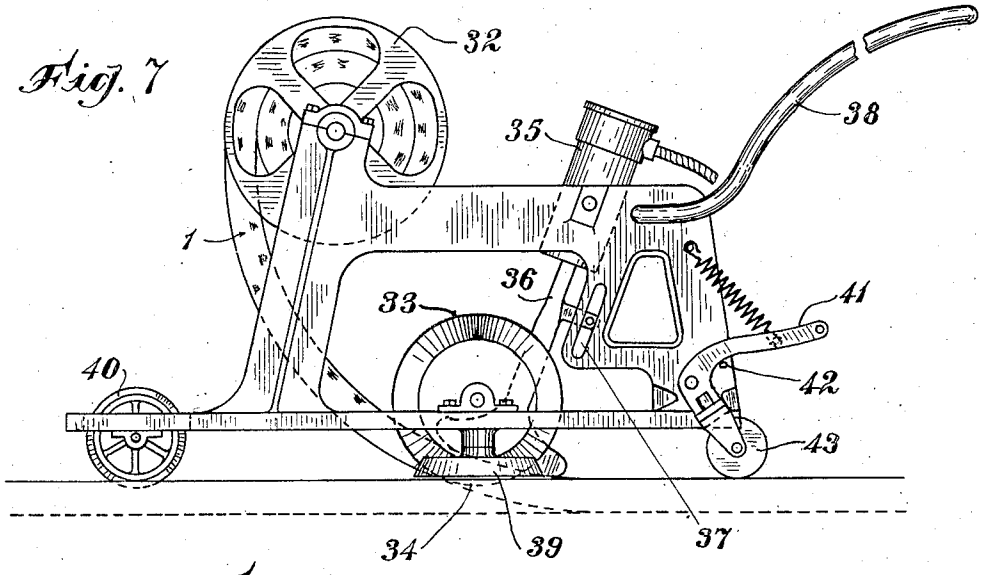


Fig. 8

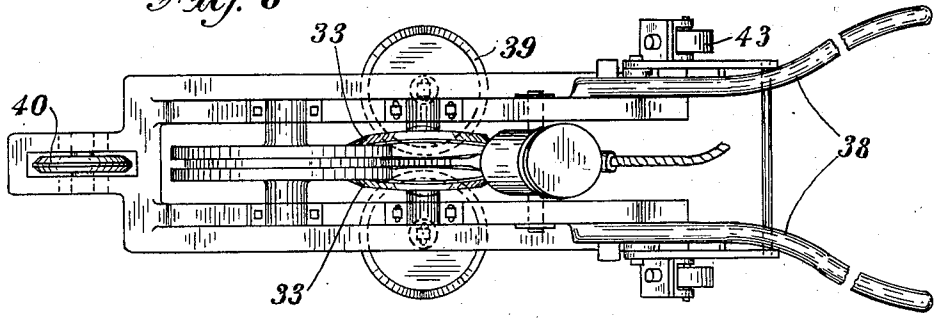
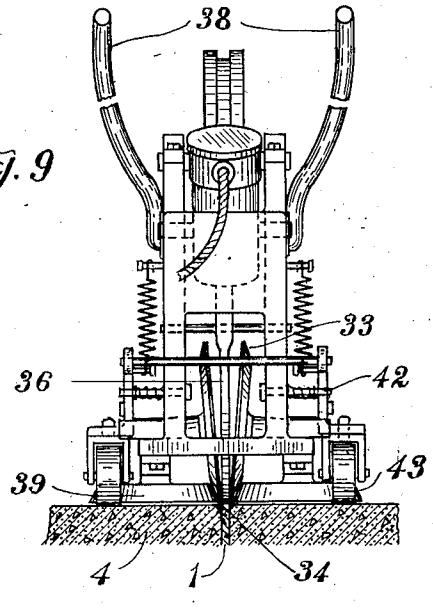


Fig. 9



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MACHINE FOR INSERTING A COMPRESSED STRIP INTO A JOINT

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Application September 2, 1933, Serial No. 687,942

4 Claims. (Cl. 94—39)

This invention relates to a machine for compressing a preformed strip of resilient material and inserting the strip, while in compressed condition, into a joint between sections of rigid material.

There has been for some time need of an improved seal for joints in concrete pavement or the like. We have now discovered convenient and satisfactory means for inserting a resilient strip to seal these joints in excellent manner.

The filler strip that is used is preformed and is composed of resilient material that is insoluble in water and gasoline and substantially resistant to the effect of fatigue upon its resiliency. Such a strip is one composed largely of granulated raw cork bonded together by means of a resinous phenol-aldehyde condensation product or other like water and gasoline insoluble binder material.

The invention is illustrated in the drawings in which:

Fig. 1 shows a side view, partly broken away for clearness of illustration, of a preferred embodiment of the machine, being used to compress and force a resilient filler strip into the joint in a concrete pavement;

Fig. 2 shows a cross sectional view on line 2—2 of Fig. 1, in the direction of the arrows;

Fig. 3 shows a sectional view of a modification in which the distance of the compression members is adjustable by means of threaded elements;

Fig. 4 shows a side view of a part of the machine illustrated in Fig. 1, in the position in which the machine is adapted to be moved over the pavement while supported thereupon by rollers;

Fig. 5 shows a perspective view of a modification of the invention adapted for use in inserting the filler strip into a joint at the corner portion of a structure;

Fig. 6 shows a member adapted for use as the means for forcing the cork strip into position and provided with a special impulse-giving element;

Fig. 7 shows a side view of a machine for inserting cork strip or the like continuously into the joint in a cement pavement;

Fig. 8 shows a plan view and Fig. 9 shows an end view of the machine illustrated in Fig. 7.

In the various figures like reference characters denote like parts.

There are shown the resilient filler strip 1, compressing means or elements, two in number, provided with plane surfaces 2 in sloping relationship to each other and defining between them a space having the shape of a truncated wedge that becomes narrower towards the edge portion of the inclined surfaces extending towards the joint 3. The joint 3 is defined between sections of cast concrete 4.

The elements provided with the said plane surfaces may be fixed in position with respect to each other, as by the cross straps 6 (Fig. 1) or by the adjustable threaded elements 7 coacting with brace 8 (Fig. 3). Also, the elements of plane surface may be held in contact with the pavement by foot plates 9, upon which the operator may stand. Also, the distance apart of the sloping surfaces 2 may be adjusted by laying thereover additional plates 10 of selected thickness and also of plane surfaces, to decrease the space between the plates. The lower edges of the plates 10 suitably extend into the joint, as illustrated at 5 (Fig. 2).

The cork or other resilient strip, after being inserted between the plane surfaces, is then forced downward, as, for example, by the forcing means comprising an end portion 11, eccentrically mounted on the pin 12 and the handle 13. It will be observed that the pin 12 is engaged beneath elements 21, which form a recess between them and the upper surface of the plates 2. As the handle is properly manipulated, the longer side of the eccentrically mounted end is forced down against the cork strip, the cork strip being precompressed and, while in fully compressed and substantially original resilient condition, being moved into the joint under the influence of the force thus applied, as illustrated in Fig. 1. The handle is provided with the pin 14 which, striking against the tops of the members 21, constitute limiting means for controlling the extent to which the handle may be moved downward and, consequently, the depth to which the cork strip is forced into the joint. A suitable adjustment is one such that, when the pin 14 strikes against the top of the members 21, the filler strip will have been forced into the joint just so far that the upper surface of the filler strip is approximately flush with the upper surface of the joint.

The machine is suitably mounted upon two wheel assemblies of which only the one at the left is shown in Fig. 1. This wheel assembly comprises the wheel or wheels proper 15, a yoke 16 therefor, and a collar 17 with flat upper surfaces. When the upper surface of this collar is made to assume a horizontal position as illustrated in Fig. 4, the slotted or grooved lug 18 on the machine rests in stable manner upon the collar, the distance of which above the bottom of the wheel is such as to lift the main portion of the machine off the pavement. In this condition the machine may be

moved conveniently over the pavement to a new location.

When it is necessary to use a machine in close quarters, as, for example, at the corner made by a pavement and a brick wall, the machine may be modified to the form illustrated in Fig. 5. This machine also has the compression members with sloped surfaces 2 and footplate 22. In this modification the forcing means 23 include a hand operated plunger with pins 24 placed therein, to limit the extent to which the plunger may be forced downward, and thereby limit or control in a predetermined manner the depth of insertion of the filler strip into the joint.

In the modified form of forcing means shown in Fig. 6, there is a lower element 19 adapted to rest upon the cork strip and an upright member or handle 25 and, disposed therearound, a hollow intermittent-impulse-producing element 26 supported on its lower side upon the spring 27 and engaged on its upper side against the spring 28 acting against a collar 29 secured to the handle by the set screw 30. The element 26 is free to oscillate upward or downward. By proper manipulation of the handle, as by a quick upward or downward movement thereof, it is possible to set the element 26 in motion and then to amplify the natural tendency to oscillation. When the element reaches the bottom of a downward swing or oscillation, the element then imparts an impulse to the element 19 and gives force thereto in addition to the pressure that may be applied by an operator through the handhold 31.

The method of operating the machine described and illustrated in Figs. 1–5 should be evident from the description given.

The machine is first lined up with the joint in the pavement. The resilient filler strip is then inserted between the inclined plane surfaces in the upper portion of the space defined therebetween. The strip should be of thickness not greater than the thickness of the joint to be filled, and of width, in uncompressed condition, that is suitably 133 to 200% of the width of the joint. When the strip of selected thickness and width has been placed between the plane surfaces, then the forcing means with end 11 somewhat resembling a battle axe is engaged in the machine, as illustrated in Fig. 1, and the handle 13 of the machine is forced downward, to cause the end portion 11 to bear upon the cork strip and force it downward into the joint. When the cork strip at any position has been thus inserted into the joint, then the forcing means is moved a short distance to a new, adjacent position and the forcing down of another portion of the strip is effected. When, finally, the entire length of the joint has been filled, the machine is disengaged from the pavement by shifting the position of the supporting wheel from that illustrated in Fig. 1 to that illustrated in Fig. 4. The machine is then lined up with another joint and filler strip is inserted in the manner described. When a length of filler strip is exhausted, another length may be supplied to the machine, the two strips being caused to abut, end to end, in the joint being filled.

When the joint to be filled is near a corner, as illustrated in Fig. 5, the modified form of the machine there illustrated may be used, and the filler strip forced downward between inclined surfaces by means of the hand-operated plunger 23.

For large constructions in which the joints to be filled are of great length, there may be used the continuous machine illustrated in Figs. 7–9.

In this machine a reel 32 feeds the filler strip 1 into the compression means, including the inclined discs 33, forming between them a space decreasing in width in the direction of the joint. Suitably these discs have beveled edges which extend into the joint, as illustrated at 34, to minimize expansion of the compressed strip while it is being forced into the joint. The means for forcing the strip into the joint include, in this case, the air hammer 35, operating a plunger 36, which extends between the inclined discs, as illustrated in Fig. 9 and also in Fig. 1. A pin on the plunger is engaged in the slot 37 (Fig. 7) to limit the movement.

The continuous machine may be moved over the pavement, as by means of the handles 38, spaced to accommodate the operator.

To prevent spreading of the discs 33, as the cork strip is forced therebetween, there are provided reenforcing discs 39, which contact with each of the first mentioned discs, on the outside portion thereof nearest to the other discs 33.

In using this continuous machine, the machine is placed in the operative position over the joint, which is facilitated by means of the guide wheel 40, with beveled edge adapted to be engaged in the joint that is to be filled. The filler strip 1 is then fed in between the compression discs 33 and engaged at the end within the joint. The machine is then gradually moved along the joint.

The engagement of the end of the filler strip within the joint and the freedom of movement of the reel 32 provide means for feeding the strip into the compression means at a linear rate approximately equal to that of movement of the machine along the point. As the plunger 36 of the air hammer comes down upon this strip and, in contact therewith, forces the strip into the joint, there is, momentarily, retardance of the movement of the machine over the pavement, except as the end of the hammer in contact with the filler strip slips thereover. However, the impulses of the air hammer are intermittent and each of momentary duration only, so that the movement of the machine is not substantially impeded.

When it is desired to place the machine in inoperative position, as for movement to a new location, the operator may step on the foot bar 41, force it down below the pin 42 until it is engaged therebelow. As this is done, the rear end of the machine is raised upon the wheel support 43, so that the mechanism does not touch the pavement.

The details that have been given are for the purpose of illustration, and not restriction, and variations therefrom within the scope of the appended claims may be made without departing from the invention.

What we claim is:

1. In a machine for compressing a strip of resilient material and forcing the strip into a joint between rigid sections of material, means for establishing the width of the compressed strip including two substantially plane surfaces, in sloping relationship to each other, defining therebetween a space becoming narrower at an edge thereof and means for forcing the strip, in compressed condition, between the plane surfaces, through the said space, and from the narrower edge of the space into the joint, the said plane surfaces at their edges defining the narrower portion of the space, extending into the joint,

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whereby expansion of the compressed strip before being inserted into the joint is prevented.

2. In a continuous machine for compressing a strip of resilient material and inserting it into a joint between sections of rigid material, means for moving the machine along the joint, means for compressing the strip to a width not greater than the width of the joint, including two rotatable discs in sloping relationship to each other and defining therebetween a space becoming narrower in the direction of the joint, means for supplying the strip continuously to the means for compressing it, at a linear rate approximately equal to the rate of movement of the machine along the joint, and means for forcing the strip continuously through the compressing means and into the joint.

3. In a continuous machine for compressing a strip of resilient material and inserting it into a joint between sections of rigid material, means for moving the machine along the joint, means for compressing the strip to a width less than the width of the joint, including two rotatable discs in sloping relationship to each other and defining therebetween a space becoming narrower in the direction of the joint, means for supplying the strip continuously to the means for compressing it, at a linear rate approximately equal to the rate of movement of the machine along the joint, and means for forcing the strip continuously through the compressing means and into the joint, the said rotatable wheels being engaged at their lower portions within the joint, whereby expansion of the compressed strip before being inserted in the joint is prevented.

4. In a continuous machine for compressing a strip of resilient material and inserting it into a joint between sections of rigid material, means for moving the machine along the joint, means for compressing the strip to a width less than the width of the joint, including two rotatable discs in sloping relationship to each other and defining therebetween a space becoming narrower in the direction of the joint, means for supplying the strip continuously to the means for compressing it, at a linear rate approximately equal to the rate of movement of the machine along the joint, and means for forcing the strip continuously through the compressing means and into the joint, the said rotatable wheels being engaged at their lower portions within the joint, whereby expansion of the compressed strip before being inserted in the joint is prevented and said means for forcing being adapted to apply pressure intermittently for short periods of time only, whereby movement of the machine along the joint and feeding of the strip continuously are not seriously impeded.

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